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Information Technology Usage, Top Management Support and Internal Audit Effectiveness

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ABSTRACT

There has been a marked increase in the global practice to focus on internal auditing as a mechanism to protect companies. With the advent of information technology, companies are presented with even more opportunity to improve the way they perform internal audit. However it is expected that such opportunity is dependent upon other factors such as management support. This research examines the moderating effect of top management support on the relationship between information technology usage and internal audit effectiveness. Questionnaires were sent to internal auditors in Yemeni private companies, with a total of 104 responses obtained. The study found a significant positive relationship between information technology usage and internal audit effectiveness. Similar result was obtained on the relationship between top management support and internal audit effectiveness. However the study found that top management support does not moderate the relationship between information technology usage and internal audit effectiveness.

Key words: internal audit; information technology; management support.

INTRODUCTION

The unprecedented advances in technology have revolutionised nearly all aspects of life and sciences including accounting. Previous studies have highlighted a positive relationship between information technology usage (ITU) and internal audit effectiveness (IAE). An effective internal audit depends heavily on the use of IT (Bierstaker, Burnaby, & Thibodeau 2001; Moorthy, Mohamed, Gopalan, & San 2011). IT and IT knowledge is indispensable for internal audit functions (Henderson, Davis & Lapke 2013). However, there is a difference in the effectiveness of the internal audit for each individual company. Differences in the level of effectiveness of the internal audit and its use of IT between companies depend on a number of factors (Mihret & Yismaw 2007). Researchers have suggested that in order to obtain high levels of efficiency in IT within an organisation, support from top management is crucial (Doll 1985; Ragu-Nathan, Apigian, Ragu-Nathan & Tu 2004; Sartorius, Eitzen & Kamala 2007; Shields 1995). Therefore given the use of IT within the internal audit, the differences in the IAE between organizations could be influenced by factors including top management support (TMS). This study attempts to identify the moderating impact of TMS on ITU's effect on IAE.

The internal audit plays an important role in evaluating the effectiveness of internal controls to provide accurate information by collecting information concerning implementation and performance as a means to identify errors or inefficiencies (Spira & Page 2003). The internal audit seeks to identify system controls designed to prevent and disclose irregularities that may lead to poor decision-making. The internal audit is an independent objective assurance and consulting activity designed to add value and improve a company's operations (Hass, Abdolmohammadi & Burnaby 2006; Nagy & Cenker 2002). It helps an organization accomplish its objectives by bringing a systematic and disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes.

In the context of achieving optimised performance, top management plays a vital role, particularly for the audit process. This has been demonstrated by a number of prior studies (Cohen & Sayag 2010; Mihret & Yismaw 2007). Audit departments and auditors therefore require support from top management to improve the audit process. In addition to TMS' direct influence on the audit process, TMS has also been considered as a moderator to the drivers of competitive advantage through awareness, motivation and capability (Chen & Miller 1994). Specifically, when top management gives encouragement and training on the use of audit software tools, it is expected that internal auditors will perform their tasks better with the use such tools. Past studies however have not examined the role of TMS on the relationship between IT and internal audit (Salehi & Husini 2011). This study therefore tries to fill the gap by examining the role of top management on the effective implementation of electronic systems to enhance internal audit function. Specifically, the study aims to examine; 1) the relationship between ITU and IAE, 2) the relationship between TMS and IAE, and 3) the moderating effect of TMS on the relationship between ITU and IAE.

To achieve its targeted objectives, this study uses the resource-based view (RBV) as the underlying theory. RBV conceptualizes the firm as a bundle of resources (Hamel & Prahalad 1994) combined based on competitiveness. Each bundle pertains to specific functions and distinctive

and valuable resources and capabilities that distinguish the firm from other firms. These bundles also allow a firm to deliver products and services in the market. Furthermore, the resource-based theory was developed to better understand how organizations plan and achieve sustainable competitive advantage (Barney 1991). For this reason, this research adopts the RBV theory to develop and investigate the relationship between IT, TMS and IAE.

Literature Review

The internal audit process plays a key role in the control of an organization. Due to significant role of the internal audit in each company, this research investigates the factors that influence the effectiveness of the internal audit. One of these causes is TMS for internal audit functions. The main propose of this literature review is to follow the development in prior studies and to identify a research gap. This chapter places the study in context by reviewing the relevant literature and theories on ITU, TMS and IAE.

INTERNAL AUDIT EFFECTIVENESS

Internal auditing (IA) is a significant component of a business as it reports on financial performance (Prentice 2000). Internal auditing is an independent, objective, integrity assurance and consulting activity designed to add value and improve an organization's performance and operations. Ebaid (2011) mentioned the differences between the internal audit function before and after the financial scandals in 2008. He advocated that the internal audit function was designed to maintain a firm's assets and help in providing reliable accounting information for decision-making purposes. However, the failure of companies in the United States and Europe such as Enron and WorldCom led to a decrease in the level of confidence in audit firms. This has highlighted the importance of the internal audit function to predict risks and provide financial consulting and translation of financial information to top management and shareholders to make appropriate decisions (Ebaid 2011). Thus, internal auditors play an important role in monitoring a company's risk profile, and identifying and predicting areas to improve risk management (Goodwin & Yeo 2001). It helps an organization accomplish and achieve its objectives by introducing a systematic and disciplined approach to evaluate or assess and improve the effectiveness of risk management, control, and governance processes.

For a successful internal audit, there must be a logical analysis and evaluation of data and business processes during a certain period. The internal audit must be committed to the integrity and credibility of financial reports. The internal audit provides value to top management and governing bodies. Professional internal auditors provide assurances to the organization about audit activity.

Assessing and monitoring the effectiveness and efficiency of a company's internal control system is an important role of the internal audit function to ensure that the company's processes are in proper state (Kaplan & Schultz 2007). Raghunandan and McHugh (1994) consider IAE as a function of independence and objectivity. IAE reflects the level of independence and objectivity of auditors. It also indicates the extent to which internal auditors feel freedom from conditions that threaten their objectivity or the appearance of their objectivity. These threats to objectivity should be managed at the individual auditor, engagement, functional and organizational levels. Objectivity is considered essential for internal auditors' proper discharge of responsibilities (Christopher, Sarens & Leung 2009).

There are also some factors that influence the effectiveness of internal audit such as internal audit proficiency, work and performance and audit committee. In terms of internal audit proficiency, technical competence and continuous training are very important and are considered fundamental to effective internal audit. Al-Twaijry, Brierley and Gwilliam (2003) asserted that internal auditors could not have power unless they have essential skills and qualifications. An IA department should employ internal auditors with high and variety of skills to be able to undertake audits of financial activities (Flesher & Zanzig 2000). In terms of work and performance: the scope and quality of work is another factor that reflects IAE. Specially, the level of internal audit's scope of work and the standard with which the audits are planned, executed and reported are important illustrations of effective internal audit (Albrecht, Howe & Schueler 1988; Al-Twaijry et al. 2003). In terms of audit committee, its importance is with regards to playing the crucial role in providing oversight to the internal audit function. Audit committees must assess the performance and effectiveness of internal audit function (Schneider 2010) through evaluating the internal audit's organizational structure and ensuring that the function has sufficient staff to fulfil its mission (Bailey 2007).

Through this monitoring role, the internal audit function seeks to help a company achieve the objective of trusted financial reporting by auditing the actions of management and acting as a deterrent to aggressive financial reporting through enhanced IAE (Prawitt, Smith, & Wood 2009).

INFORMATION TECHNOLOGY USAGE

Among the most important reasons for the study and development of information systems is its wide spread use and how it has changed the business environment. It has shortened the period for processing data and performing multiple tasks. Thus the use accounting information systems is indispensable (Gelinas, Dull & Wheeler 2011). In order to meet the challenge of fierce international competition, most organizations depend heavily on sophisticated electronic data processing (EDP) systems to manage daily business transactions and strategic accounting records. The increasing dependence on EDP

systems led to increase concern from audit practitioners and professional organizations regarding the upkeep of transactions and account information in electronic form, which is readable only to computers (Lin & Wang 2011). Information technology assists the audit function in numerous ways. There are numerous software used in audit processes such as text processing, spreadsheet, and graphics. Word processor allows the user to enter and manipulate textual information. Spreadsheet software is used in auditing processes and gives users the ability to automate many of the functions of business administration and accounting (Coderre 2009). Audit packages such as Spreadsheet Auditor and Excel Smart Tools Auditor, can be used to verify the internal consistency of spreadsheets. Furthermore, computer assisted auditing techniques (CAATs) are computer-based tools and techniques that permit auditors to increase personal productivity as well as that of the audit function. They can significantly improve audit effectiveness and efficiency during the planning, conduct, reporting, and follow-up phases of the audit (Pedrosa & Costa 2012). CAATs lead to significant improvement in audit quality and assist auditors to perform complex tasks that would be impossible or take a long time if performed without the accompanying technology. In this study therefore, ITU refers to the use of both general software that internal auditors use to assist in their work and specific audit software such as the CAAT.

IT audit literatures have a variety of resources to guide practitioners in their operations that provide overviews of audits of IT and a clear direction for the audit functions. For instance, the information system audit and control associations (ISACA) control objectives for information and related technology provides detailed group of potential controls and checklists. The audit organization expects auditors to have skills not only in the conventional aspects of financial systems, but also in the electronic systems management. Computer assisted auditing operations control auditing security and reliability. Internal control of computer-assisted auditing depends on much data and information. In addition, the auditors should be skilled operators and access the data by the system that may help the organization to evaluate the state of internal control (Lin & Wang 2011). Nevertheless, there was little academic research on the audit process, specifically, about factors that affect the quality of the audit and IT (Stoel, Havelka & Merhout 2012). In fact specifically, the maturity level of the adoption of generalized audit software among internal auditors has been relatively low despite the prevalent use of IT and big data in businesses (Smidt 2016). The Institute of Internal Auditors found only 40 percent of internal audit departments adopt information technology (McCafferty 2016). Low performance expectancy and poor facilitating conditions have been suggested as reasons for the low adoption (Mahzan & Lymer 2014), eventhough use of the audit software has been found to allow prompt extraction and analysis of voluminous data (Sihwa 2014).

Pathak, Chaouch and Sriram (2005) explained how mechanisms for internal control are influenced by technology. Audit organizations encourage auditors to pursue the necessary IT skills to ensure that they perform effective audits that integrate with audit IT technologies. Traditional audit skills are no longer adequate for effective audits in a technology driven business environment. At this stage of the convergence trend, technology can provide new capabilities and also pose threats to physical security and risk management. Le Grand (2013) discussed the reliance on ITU in audit management in an organization.

TOP MANAGEMENT SUPPORT

There is strong support from literature for the importance of TMS as a successful factor of almost all programs and processes within an organization. Pathirage, Jayawardena and Rajapaksha (2012) found that TMS significantly increases team performance and practice. With respect to IT, TMS plays an important role to enhance the systems and users through training, system development, and operations (Igbaria 1992). There is a positive relationship between IT and TMS (Igbaria, Guimaraes & Davis 1995; Igbaria, Parasuraman & Baroudi 1996).

Regarding the relationship between TMS and IAE, Al-Twaijry et al. (2004) stated that the relationship between internal audit staff and management is important to specify the independence of the internal auditor. Management support is among the most important factors (the other being internal audit quality) influencing audit effectiveness. On the other hand, a fraudulent audit quickly attracts the attention of the management attention to support safe processes and reduce any defects (Mihret & Yismaw 2007). The preparation before commencing an audit involves collecting background information and assessing the resources and skills required to perform the audit. This enables staff with the right kind of skills to be allotted to the right tasks necessary to perform the audit (Sayana & CISA 2002). Furthermore, certain performance standards (2010, 2020, 2060) address more specific means by which senior management can support the internal audit. The chief audit executive must consider the input of senior management (CEO/CFO) during internal audit planning (Doyon 1996; Hubbard 2000).

In addition, after the audit scrutiny is completed, it is better to provide the audit findings and suggestions for corrective action to top management in a formal meeting. This will ensure better understanding and increase buy-in of audits that are recommended. It should also give auditors an opportunity to express their viewpoints on the issues raised. Writing a report after such a meeting where agreements are reached on all audit issues can greatly enhance audit effectiveness. Several methodological various studies showed that employees who are supported by their organisation are satisfied with their job (Colakoglu, Culha & Atay 2010).

However, there is little depth in research that has addressed TMS and its role in an effective audit within the framework of IT integration (Sawyer 1973). Wu et al. (2017) studied team-problem solving in internal audit

and found that team problem-solving ability moderates the effect of competencies on internal audit performance. Their study did not look into TMS whereas internal audits do not only function in teams, but within organizational environments that may be shaped by top managements. Therefore the role of TMS is an important area of study given the importance of IT integration in the audit process and in contemporary business environments (Anakwe, Igbaria & Anandarajan 2000; Igbaria & Iivari 1995).

It has been suggested that management can support internal auditors by providing training, facilitate easy communication with management, and authorization access to data. Management can support IT by evaluating and extending IT audit systems. The internal audit can play a major role in the company's hazard monitoring and identifying areas to enhance risk management processes. On the other hand, internal auditors can support management through consultancy services, which contribute to the establishment of sound risk management operations, by facilitating the management's efforts to improve the internal control system, and give counselling on the implications of organizational changes to the system (Leithhead 2000; Lindow & Race 2002; Page & Spira 2004; Spira & Page 2003). Furthermore, meeting with top management allows employees to share and clarify issues about business concerns and their opinions to assist in effective internal audits (Wand & Weber 1989).

FRAMEWORK AND HYPOTHESIS DEVELOPMENT

Resource-based view is a way of viewing the firm in terms of approaching strategy. It considers the firm as a bundle of resources (Hamel & Prahalad 1994). RBV was developed for understanding how organizations plan to achieve a sustainable competitive advantage. It emphasizes the companies' resources as the fundamental determinants of competitive advantage and performance. Resources are divided into tangible and intangible, and must fulfil the criteria of; valuable, rare, imperfect imitability and non-substitutability.

This study adopts the RBV theory to explain how information technology and knowledge, skills of internal auditors as resource of the company can improve the effectiveness of an audit and help a firm transform a short run competitive advantage into a sustained competitive advantage by increasing accurate information and information timeliness. Based on RBV, the research framework is presented as in Figure 1.

Resource based view theory focuses on the organisation resources and the utilisation of ITU. Firm's resources are considered the most important pillars for the organization's success, and which include information technology and internal auditor as tangible and intangible resources. Resource based view supports the positive relationship between the resources in achieving competitive advantage and company goals (Barney 1991).

Prior studies mentioned that information technology plays a vital role in the internal audit functions especially in planning, testing and reporting stages. Curtis et al. (2009) and Palmer, Ziegenfuss and Pinsker (2004) indicated that ITU increases the efficiency and effectiveness of accounting and auditing processes. In addition, using information technology systems can foster the reputation and prestige of the audit functions in the organization (Yam, Guan, Pun & Tang 2004).

Satava, Caldwell and Richards (2006) reported that the relationship between internal audit and related information technology is essential for the effective performance of tasks. Pedrosa and Costa (2012) stated about the positive relationship between information technology and internal audit through the role of ITU that enhances internal audit efficiency by facilitating the recalculating and testing of the financial information appropriately.

Information technology facilities, such as infrastructure and software employed by a firm, is a strategic resource for the firm to achieve greater competitive advantage. The quality of information technology and internal audit work are related to the effectiveness of auditing (Yam et al. 2004). Lin, Li and Yang (2006) discussed the evolution of audit and the rapid development of technology, which openly contributed to auditing. Information technology system and electronic data processing (EDP) have changed the ways organisations conduct its business, promote operational efficiency, and help in the decision-making process. Furthermore, using information technology systems can foster the reputation, reliability and prestige of the internal audit functions in the firms (Pedrosa & Costa 2012). Thus with this in mind, the research develops the following hypothesis:

H_1: There is a positive relationship between information technology usage and internal audit effectiveness.

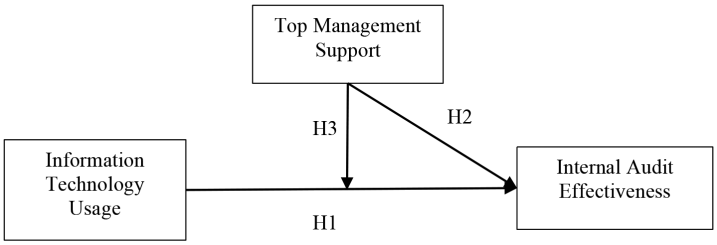

FIGURE 1. Research Framework

Previous studies confirmed the positive effect of TMS on enhancing the role of internal audit and internal auditors through constant support to internal audit activities (Albrecht et al. 1988; Al-Twaijry et al. 2003; Mihret & Woldeyohannis 2008). Open and direct communication between top management and internal audit department positively affects audit performance (Sarens & De Beelde 2006). This will decrease the misunderstanding between internal audit department and top management. Thus, top management should review and approve internal audit planning, resource requirements and listen to their recommendations. In contrast, internal auditors should ensure the quality, efficiency of risk management system and internal control system. Furthermore, they should be involved in the assessment and recommendation of the internal audit report submitted to top management.

Internal audits provide reports to directors and top management for review and making sound decisions. Management supports internal auditors by providing training, facilitating easy communication with management, and authorizing access to data. Management can support information technology by evaluating and deciding on the adoption or upgrade of information technology. In addition, good management support can be rendered in many ways, for example, by aiding auditors to overcome obstacles, exhibiting commitment to operate and encouraging staff to work effectively (Ismail, Majid, Roosli & Ab Samah 2014). Thus, internal auditors play an important role in monitoring a company's risk profile, and identifying and predicting areas where risk management can be improved (Goodwin & Yeo 2001). Internal audit helps an organisation accomplish its objectives by introducing a systematic and disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes. The internal audit must be committed to the integrity and credibility of financial reports. The internal audit provides value to top management and governing bodies. Professional internal auditors provide assurances to the organisation about audit activity.

Resources are the backbone of any organization and resources can be categorized in terms of financial resources, human resources and technological resources. Thus top management should provide the essential needs which is appropriate to proceed the internal audit functions smoothly such as appropriate budgeting, allowances, assistance to technology programmes and providing sufficient time for job completion (Phillips 2009). Management support is considered as an important factor for successful task execution. Internal auditors need resources during the execution of internal audit functions to ensure proper accomplishment of the tasks. Top management should provide enough training to internal auditors. There are also other factors that may affect audit work such as bonuses, motivation and good communication between internal audit and top management (Masood & Lodhi 2015).

Regarding the above discussion, Sarens and De Beelde (2006) confirm that TMS can significantly affect firm and internal audit performance. Top management is considered as a driver of competitive advantage through awareness, motivation and capability (Chen & Miller 1994). Similarly resource based view theory argues the same role of top management in supporting and efficiently utilising the tangible and intangible resources to enhance competitive advantage (Bridoux 2004). Hence, this study hypothesizes the following:

H_2: There is a positive association between top management support and internal audit effectiveness.

Top management support strengthens employee efforts in the organisation, resulting in greater efforts to fulfil the organisation's goals (Eisenberger, Huntington, Hutchison, & Sowa 1986). Management support has a significant effect on job satisfaction and organisational commitment. Internal auditors should demonstrate proficiency in their profession (Lapierre et al. 2008). Furthermore, they must stay abreast of recent developments in their profession.

Resource-based view helps to explain the association between employees and top management who have the authority to control resources. In return for a high-level of support, companies find employees working harder to help their organisations to reach their goals (Aselage & Eisenberger 2003; Watt & Hargis 2010). Full support from top management leads to achievement of tasks or function within an organisation effectively (Wilke 2008). Organisational support effectively influences performance. Chen and Miller (1994) considered top management as a moderator to the drivers of competitive advantage through awareness, motivation and capability, suggesting that resources should be at the heart of competitive and managed by rational managers and thus leading to maximum utilization of resources and increasing the firm's performance. So, based on Chen and Miller (1994)'s argument which provides evidence about the importance of management support this study also used TMS as a moderating variable to the drivers of competitive advantage, which are information technology and internal audit. Previous study mentioned about the effectiveness of information technology on audit function and the importance of top management to internal auditor performance (Mihret & Yismaw 2007). Therefore it is expected that TMS moderates the ITU and IAE relationship by inducing greater effort of effectively using information technology in performing their tasks.

Therefore, the hypothesis is as follows:

H_3: Top management support moderates the relationship between information technology usage and internal audit effectiveness.

METHOD

The empirical work in this study is based on data collected via survey of internal auditors in private companies. Data was collected via the survey of internal auditors in Yemeni private companies registered in Yemeni Association for Internal Auditors. The association has 371 members from which the research sample targeted 300 active internal auditors. The survey design was based on questions that could be easily answered by the target-respondents and which would limit possible framing effects. The questionnaire was first tested among a number of internal auditors as a pilot study, which lead to changes to the questionnaire to make it more understandable. A total of 300 questionnaires were distributed but the total number of responses was 107 which equals 36% from the total. Three questionnaires were excluded because some questions were not answered, leading to an actual response rate of 35% (104 usable questionnaires).

Information technology usage was measured using Igbaria (1990)'s instrument that has six questions indicating frequency of usage and extent of usage questions designed with five-point scale ranging from (1) "not at all" to (5) "very frequently" and (1) "not at all" to (5) "to a great extent", respectively. Top management support is measured by eight questions through two items; (1) budget provided to IA department, and (2) training and developing the IA staff. These questions were asked through a five point Likert-type item questionnaire, capturing responses ranging from "strongly disagree" to "strongly agree". Finally, IAE was measured by three dimensions; auditing quality, auditees' evaluations, and added contribution of internal audit; using 23, five point Likert-scale questions adapted from Cohen and Sayag (2010), capturing responses from "strongly disagree" to "strongly agree".

A regression analysis was used in this study, modelling IAE as a function of the explanatory variables. The regression model as follows is used to test the association between the dependent variable of IAE and independent variable of ITU, moderating variable of TMS:

$$IAE = C + \beta_1 (ITU) + \beta_2 (TMS) + \beta_3 (ITU*TMS) + \epsilon$$

RESULTS

Table 1 indicates the descriptive statistics of the dependent, independent, and moderating variables. Using data from 104 respondents from financial and non-financial companies in Yemen, it was found that the mean IAE is 3.48 with a minimum of level 1 and a maximum of level 5. In addition, ITU was found to have a mean of 3.63 with a minimum of 1.63 level and maximum 5 level. Finally, TMS was found to have an average of 3.51 with a minimum of 2.13 level and maximum 4.65 level.

Construct reliability is considered a measure of the internal consistency of a set of scale items (Sekaran 2006), with the most commonly used being Cronbach's Alpha. Table 2 shows the scale of Cronbach's alpha in this study for items ITU, TMS and IAE are 0.90, 0.86 and 0.86 respectively. These values indicate that the constructs are good and consistent[1].

Table 3 shows that no multicollinearity problem occurred as the VIF for all independent variables is less than 10. For interaction between the variables or moderating interactions, some prior studies used centered variables to show the relationship and reduce the problems with multicollinearity of correlation between variables (Stauber et al. 2013). In this study, the moderating variables were centered to the mean before multiplication to reduce problems with multicollinearity and to test a moderator hypothesis.

Table 4 shows that the linear combination of all independent variables significantly predicts IAE except the moderating variable, $R^2 = 0.19$ $F = 7.9$, $P =< 0.05$. This model accounts for 19% of the variance in IAE. The F ratio of 7.9 is statistically significant at 1% level. Based on the regression output, R^2 is 19.1%, indicating that 19.1 percent of the variability of IAE can be explained by 100 percent variability of ITU and TMS. A review of the regression coefficients indicates that ITU and TMS have positive relationships with IAE and the relationship is significant at 10% and 1% level. The beta weights (β) reveal that TMS has the strongest effect on IAE. The moderating variable was found to be insignificant as shown in table.

TABLE 1. Descriptive Statistics of the Variables

Variables	N		Mean	Std. Deviation	Minimum	Maximum
	Valid	Missing				
IAE	104	0	3.48	1.01	1.00	5.00
ITU	104	0	3.64	0.66	1.63	5.00
TMS	104	0	3.52	0.45	2.13	4.65

TABLE 2. Cronbach Alphas

Items	Number of Items	Cronbach's Alpha
ITU	6	0.90
TMS	8	0.86
IAE	23	0.86

From the discussion in previous chapters, a positive impact of ITU on IAE is expected. The regression results for the model are shown in Table 4. The findings support this hypothesis and provide evidence that ITU is positively associated with IAE. The path that connects ITU and IAE in the table shows a significant coefficient value of 0.19 and *p* value of 0.053. Thus, a significant positive coefficient for ITU suggests that ITU has a significant impact on IAE. Therefore H1 is supported.

Top management support is predicted to have a positive impact on IAE based on prior study. Pathirage, Jayawardena, and Rajapaksha (2012) indicates TMS as a successful factor of almost all programs and processes within an organisation. Furthermore, TMS significantly increases team performance and practice and plays an important role to enhance the systems and users through training, system development, and operations (Igbaria 1992). The link between TMS and IAE as shown in Table 4 generated a coefficient value of 0.29 which is significant at 0.0044. Hence, hypothesis 2, which states that TMS is positively related IAE, is supported. This means that a higher proportion of TMS would increase IAE.

Hypothesis 3 expected a positive interaction of TMS on the association between ITU and IAE. The findings do not support this hypothesis and provide evidence (*t* value -0.135 and *p* value 0.265) that TMS has no significant interaction on the relationship between ITU and IAE. This indicates that TMS may not impact on the direction and degree of the relationship between ITU and IAE.

Discussion and Conclusion

The importance of IA is demonstrated in the growing demand for this service in all organisations and in the rapid growth of its professional organisation. Through the increasing demand of internal audit service in all organisations and rapid growth of its professional organisations, the IAE has become more important and indispensable. It helps an organization accomplish its objectives by bringing a systematic and disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes. Despite the importance of internal audit, researchers gave a little attention to this function and without great interest (Eden & Moriah 1996). The main objective of this study was to examine auditing effectiveness in Yemen private organisations, specifically through identifying the impact of ITU and TMS on IAE.

The study found that that ITU significantly effects IAE and this provides evidence to support prior research. In accordance with previous studies, the internal audit should assess the current level of information technology integration in the audit process to determine the levels of efficiency and ensure security is maintained (Kagerman, Kinney, Kuting & Weber 2008). Information technology systems greatly impact on the auditors' activities as all audit technologies are designed to increase audit efficiency and effectiveness, and using information technology systems can foster the reputation and prestige of the audit firm.

TABLE 3. Correlation Results

	IAE	ITU	TMS	ITU*TMS	Tolerance	VIF
IAE	1				0.88	1.13
ITU	.29***	1			0.86	1.17
TMS	.38***	.34***	1		0.57	1.77
Centering ITU*TMS	.19	.53***	.55***	1		

***. Correlation is significant at the 0.01 level (1-tailed).
**. Correlation is significant at the 0.05 level (1-tailed).
*. Correlation is significant at the 0.1 level (1-tailed).

TABLE 4. Regression Results

	B	t	Sig
(constant)		81.16	0
ITU	0.19	1.95	0.053*
TMS	0.29	2.95	0.0044***
Centering ITU*TMS	-0.14	-1.12	0.27
	R^2=0.19		
	Adjusted R^2=0.16		
	F-value=7.9		
	P < 0.05		

***. Correlation is significant at the 0.01 level (1-tailed).
**. Correlation is significant at the 0.05 level (1-tailed).
*. Correlation is significant at the 0.1 level (1-tailed).

Through the importance of ITU, the findings indicate that the effectiveness and performance of internal audit reflects the extent and frequency level of ITU.

The study also found a positive relationship between TMS and IAE. The results of this study confirmed that TMS significantly affects the level of IAE. This suggests the need for efforts to increase the role of top management, particularly in Yemeni companies. The finding is in line with Al-Twaijry (2004), Anakwe, Igbaria, and Anandarajan (2000), and Pathirage, Jayawardena and Rajapaksha (2012).

However the study found that TMS does not significantly impact on the relationship between ITU and IAE. As theoretically and hypothetically supported, there should be a significant effect of TMS on the relationship between ITU and IAE, however the reality of the result was insignificant. A possible justification for the insignificant result is that internal auditors tend to be more independent following the requirements from the internal audit standards which state that internal audit activity must be independent. In order for the use of information technology to be effective in increasing the effectiveness of the internal audit, internal auditors do not necessarily rely on TMS. Being more independent, they may fulfil the need for improving the effective use of information technology through other sources and through their own initiative. Therefore whether or not they receive TMS or the extent of TMS they receive regarding the use of information technology does not have any impact on how their use of information technology affects the effectiveness of their internal audit.

This study addressed numerous issues important for effective internal audits. This study found that the internal audit must constitute an independent managerial function to enhance efficiency and optimise performance. This necessitates cooperation between internal auditors and top management. Such cooperation enhances efficiencies across the firm. Currently, TMS of internal audit reports is important for the organisation. In the context of Yemeni companies, the importance of the internal audit department is gaining traction. As such, the research findings are set to improve firm performance in Yemen by fostering better internal audit practices coupled with the support of top management. This is set to promote efficiencies while also working towards mitigating irregularities and waste. This research found that the management of the sampled Yemeni firms have yet to capitalise on the internal audit reports to foster optimal performance. This suggests for an increase in the role of top management because at the moment Yemeni companies have a relatively low TMS. As such, the board of directors should encourage greater cooperation and support between these two important features of a company.

While the findings from the present study provide various insights that should be of interest to internal audit departments and internal audit managers, however like many other researches, this study has its limitations. Firstly, as for the research design, the study only considered private companies and concentrated on financial companies. Other non-private companies were ignored. As such, the validation of the conclusions might not hold for non-private companies. Secondly, this research targeted internal auditors as respondents and excluded other employees like accountants, financial managers, and external auditors.

Future research would be useful to overcome the limitations of this study. It is suggested that future research should include other government sectors by using different methods. Future studies may want to consider other aspects of audit committee characteristics including meeting frequency, experience of committee members, and compliance of internal audit standards. Those are not included in this study.

NOTES

[1] The interpretations of consistency based on Cronbach's alpha are: $\alpha \geq 0.9$ Excellent (High-Stakes testing), $0.7 \leq \alpha < 0.9$ Good (Low-Stakes testing), $0.6 \leq \alpha < 0.7$ Acceptable, $0.5 \leq \alpha < 0.6$ Poor, $\alpha < 0.5$ Unacceptable [Cortina, JM. 1993. "What is coefficient alpha? An examination of theory and applications. *Journal of Applied Psychology*. 78(1): 98].

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