DETERMINANTS OF INTERNAL AUDIT EFFECTIVENESS OF TERTIARY INSTITUTIONS IN KWARA STATE

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Abstract
This study investigated the determinants of internal audit effectiveness (IAE) in tertiary institutions within Kwara State, Nigeria, focusing on the influence of top management support (TMS), internal auditor remuneration (IAR), auditor competence (IAC), IT integration, and external pressures. Given the critical role of internal audits in ensuring compliance, safeguarding assets, and promoting accountability, this study addresses significant challenges in Nigerian educational institutions, such as audit independence, remuneration disparities, and adapting to technological advancements. Through, correlation and regression analyses, the study revealed that IAR, IAC, and TMS are strong predictors of IAE. Specifically, a robust positive relationship exists between IAR and IAE, indicating that competitive salaries enhance auditor motivation and performance. Similarly, IAC is positively correlated with IAE, underscoring the need for continuous professional development to improve audit quality. TMS also positively influences IAE, emphasizing the importance of active support from top management in resource allocation and autonomy for the internal audit function. Although IT integration shows a positive correlation with IAE, its impact is not statistically significant, suggesting that effective utilization and integration of IT tools are crucial for realizing their full potential. The study recommends implementing competitive remuneration, ongoing training for auditors, and strong top management support, while focusing on optimizing IT systems. These findings provide valuable insights for improving internal audit practices and governance in Nigerian tertiary institutions and serve as a foundation for future research and policy development.

Key words: *Top Management Support, Internal Audit Effectiveness, Internal Auditor Remuneration, Auditor Competence, IT-Integration, External Pressures.*

Introduction

In recent years, the effectiveness of internal audit has emerged as a crucial concern, especially within the context of higher education institutions. Internal auditors play pivotal roles in strengthening internal control systems and enhancing the efficiency of

audit departments in both public and private organizations (Omar, 2018). Recognizing the potential benefits of robust internal audits, organizations establish internal audit departments with the aim of fortifying their internal controls. This is particularly pertinent in preventing financial scandals and irregularities, as witnessed globally in cases like Enron, Bernie Madoff scandals, WorldCom, and others (Sule, Ibrahim, & Sani, 2019). In developed countries, internal audit functions play a critical role in ensuring transparency, accountability, and effective governance within institutions, including tertiary educational institutions. These nations, such as the United States, the United Kingdom, and Germany, have established robust internal audit frameworks guided by stringent regulatory standards and best practices (Wilamsari, Musriati & Cahyaningati, 2024). In the United States, for instance, the Sarbanes-Oxley Act mandates rigorous internal controls and auditing procedures to enhance corporate accountability and deter fraud. Similarly, in the UK, the Financial Reporting Council (FRC) provides guidelines for internal audits to ensure accuracy and reliability in financial reporting. German institutions follow the principles set forth by the Institute of Internal Auditors (IIA), which emphasize independence, objectivity, and systematic methodologies in audit practices (IIA, 2022). These frameworks show the importance of top management support, adequate remuneration, auditor competence, advanced information technology, and external regulatory influences in achieving effective internal audits.

In Nigeria, instances of financial mismanagement and fraud in companies such as Cadbury Nigeria Plc,Afribank Nigeria Plc, NAMPAK, Oceanic Bank Nigeria Plc, and African Petroleum Plc shows the importance of addressing weaknesses in internal control systems and enhancing internal audit effectiveness (Sule et al., 2019). The Institute of Internal Auditors in the United States of America (IIA) has set international standards to guide internal audit practices, focusing on both the attributes of those performing internal audits and the nature of internal audit activities. This emphasizes the need for a strong internal audit function to combat financial crimes and maintain ethical standards (IIA, 2022). On the local scene, specifically within the Nigerian public sector and higher education institutions in Kwara State, financial crimes have become prevalent, hindering the sector's growth and service delivery quality (Iliemena, Racheal & Okolocha, 2021). To counter these challenges, authorities in Nigeria have recognized the importance of continually improving and strengthening internal audit departments within ministries, particularly in higher education institutions. This is seen as a proactive measure to bolster the effectiveness of internal audits and protect against external threats and unethical financial practices.

The internal audit function in the Nigerian public sector is expected to play a crucial role in ensuring that government agencies comply with laws and regulations, safeguard assets, and improve accountability and transparency. However, in practice, there are

several challenges that hinder the effectiveness of internal audit in Nigeria's public sector. Some of the challenges facing internal audit in Nigeria's public sector include inadequate funding, lack of independence, inadequate training and capacity building, and political interference (Iliemena, et al, 2021). However, despite these challenges, the important roles of internal audit department in the Nigeria public sector cannot be overemphasized, because the primary interest of internal audit aims to ensure that adequate and appropriate internal control system are in operation. Also, internal audit department in any sector, be it private or public has the major role to develop and implement a healthy internal control system, which assist organization in safeguarding of assets, ensuring true and fair financial information, proper usage of organization's resources and non-financial operations of the firm (Anoja & Nimalathasan, 2019). While discussions on the determinants of internal audit effectiveness in Nigeria have often centered around aspects like independence, objectivity, and management support in corporate organizations (Jude & Paago, 2022), the focus of this study is specifically on higher education institutions in Kwara State. Recognizing the critical role these institutions play in shaping the future, understanding and addressing the unique challenges facing their internal audit functions is essential for promoting good governance practices and ensuring the efficient use of resources within the academic sector.

Literature Review

Conceptual Review

Internal Audit Effectiveness

Institute of Internal Auditors (IIA) (2022) defined internal auditing as an independent appraisal function established within the organization to examine and evaluate its activities as a service to the organization. However, IIA adopted a new definition of internal auditing, under the old definition, the purpose of internal auditing was to 'examine and evaluate', while under the new definition it is to 'add value and improve'. This is clearly broader and more inclusive. According to the institute of internal auditors (IIA) (2022), audit effectiveness is "the degree (including quality) to which established audit objectives are achieved". The effectiveness of internal audits refers to the degree to which internal audit functions fulfil their intended objectives and contribute to the organization's goals. It involves assessing how well internal auditors identify, analyse, and address risks, as well as the extent to which their recommendations are implemented to enhance governance, risk management, and control processes within an institution (IIA, 2022). Mihret and Yismaw (2019) defined internal audit effectiveness as "the degree to which an internal audit office meets its supposed objectives or meet the expected outcome of his appraisal activity. Audit effectiveness

can also be said to mean the achievement of internal auditing objectives and goals. Olaoye and Iwarere (2020) opined that internal audit effectiveness is the attainment of the independent appraisal function established by the management of an organization for the review of the internal control system as a service to the organization.

Determinants Internal Audit Effectiveness

Internal audit effectiveness is critical for ensuring organizational accountability and enhancing operational efficiency, with several determinants playing a pivotal role (Abdelrahim & Al-Malkawi, 2022). In this study, the determinants of internal audit effectiveness examined are top management support, internal auditor remuneration, internal auditor competence, information technology, and external influences. Top management support is a primary factor, as it ensures the allocation of adequate resources, fosters a conducive environment, and bolsters the independence of internal auditors (Pangastuti, 2023). Equally important is internal auditor remuneration, which not only influences job satisfaction but also affects the ability to attract and retain competent professionals (Khavis & Krishnan, 2021). Speaking of competence, Mohd Ali, Shafii and Shahimi, (2020) asserted that internal auditor competence reflected through skills, qualifications, and experience is integral to identifying risks and providing reliable recommendations. Furthermore, the adoption and integration of information technology empower auditors to perform data analytics and automate repetitive tasks, thereby improving audit coverage and accuracy (Pinto, 2024). Lastly, external influences, such as regulatory requirements and industry standards, compel internal auditors to align their practices with evolving expectations, ensuring the relevance and reliability of audit outcomes (Syahputra, 2022). Together, these determinants form the bedrock of effective internal auditing, enhancing both its credibility and value to organizations.

Theoretical Framework

This study is theoretically underpinned by stakeholders' theory. As the name implies, stakeholder theory is an advanced development on the perception of stakeholders and its association with any business organization, and it is believed to be propounded by Freeman (1984). This theory gives a contradictory view on the view of Friedman (1962) who affirmed that it is the responsibility of the corporation to make profit for the shareholders. Freeman (1984) asserted that managers must protect the rights of all the stakeholders of an organization. Comparing the two scholars' opinions, it can be agreed that there is a distinct separation and distinction between them. Freeman (1984) defined a stakeholder as any individual or group who can affect or is affected by the accomplishment of the organization's goals. In essence, the general idea behind stakeholders' theory is to redefine the organization, and a lot of concepts before the

establishment of this theory focused on the fact that the major aim of any organization is to maximize its shareholders' wealth, as long as they do not do anything illegal.

Empirical Review

Wilamsari, Musriati and Cahyaningati (2024) examined the determinants of internal audit effectiveness and further examine the role of internal audit quality on external audit fees. Primary data was used in this research, the collection method was through distributing questionnaires. Purposive sampling criteria were used in this research as a sample selection technique and obtained a total of 43 samples. Data analysis method was conducted using Confirmatory Factor Analysis with PLS3. The object is the internal audit of companies that are members of the Japfa Group. The research results showed that competence and objectivity are determinants of internal audit quality or effectiveness. Furthermore, internal audit quality has significant effect on external audit fees.

Thahn and Tien (2023) investigated the factors that impact the effectiveness of internal audit in Vietnamese commercial banks, as well as the inter-bank spillover effects of such effectiveness. Utilizing data obtained from 24 commercial banks listed on the Vietnam Stock Exchange and Vietnam Upcom (The Unlisted Public Company Market), the study employed a Bayesian spatial regression model (a robust analytical tool) to conduct comprehensive analyses of the interrelationships and co-movements of internal audit effectiveness across these banks. The findings offer empirical support for the significant positive effects of key determinants, namely, the "Competence of the IA Department," "IA Independence," and "Management Training Ground," on the effectiveness of internal audit in Vietnamese commercial banks. Notably, the results also validate the significant positive inter-bank spillover effect of internal audit effectiveness.

Handayani, Suratno, Murni, Harnovinsah and Djaddang (2024) analysed the influence of auditor experience, auditor independence and budget time pressure on internal audit quality or effectiveness, and fraud prevention coordination. Apart from that, it also tests and analyses the mediation of fraud prevention coordination on the influence of auditor experience, auditor independence and budget time pressure on the quality of internal audits in local government internal supervisory apparatus in the Bali region. The findings in this research proved that internal audit quality and fraud prevention coordination are significantly influenced by auditor experience and auditor independence, while internal audit quality and fraud prevention coordination are not significantly influenced by budget time pressure.

Shuwaili, Hesarzadeh and Velashani (2023) conducted a study on designing an internal audit effectiveness model for the public sector in Iraq using a mixed-methods approach. The study involved semi-structured interviews with 28 audit managers and staff for the qualitative section and questionnaires administered to 399 individuals for the quantitative section. Thematic analysis software was used for qualitative data, while path analysis and structural equation modeling in Smart-PLS software were employed for quantitative analysis. The research identified 38 effectiveness factors categorized into seven main areas: communication between internal and external auditors, independence and authority of internal auditors, specialized human resources, technological resources, management support, organizational culture, and audit plans. The comprehensive model developed was validated and confirmed, with audit plans and management support being the most critical factors for internal audit effectiveness.

Adebowale and Dada (2023) investigated factors that influence the effectiveness of internal audit in selected Federal Polytechnics in south-west states in Nigeria. This study focuses on 6 Federal Polytechnics in south west states in Nigeria that were purposively chosen to represent all other Federal Polytechnics in Nigeria. The management teams and internal auditors of the selected Federal Polytechnics provide the researchers with the necessary data collected using self-structured questionnaires and responses, which were analysed using frequency count and percentage analysis. The findings of this study showed a direct strong relationship between management perception, management support, independence of internal auditors, and the efficacy of internal audits in the Federal Polytechnics in Nigeria.

Aminu, Shittu and Bello (2022) investigated the determinants of internal audit effectiveness in Nigeria's federal public service with reference to 28 self-accounting public sector organizations operating in the North East geo-political zone. Primary data was obtained from 139 valid responses out of 148 questionnaires administered on internal auditors of such organizations. Partial least square SEM technique of multiple regressions was employed for data analysis. The finding of this study revealed that the quality of internal audit work; competence; and management support were most dominant with positive significant contribution on internal audit's ability to meet its objectives, while independence and information and communication technology (ICT) conversely showed negative insignificant influence. The study recommends an improvement of operational standards and compliance with Internal Audit's minimum entry requirement.

Asika and Okolocha (2020) examined the effect of internal audit function on financial performance of commercial banks in Nigeria. The specific objectives of the study were to determine the extent internal audit control significantly improve the financial performance of commercial banks in Nigeria and ascertain the level of internal audit procedures in curbing fraud to facilitate financial performance of commercial banks in

Nigeria. The primary data was analysed with simple regression. The analysis revealed that internal audit control and procedures have positive effect on financial performance of commercial banks in Nigeria and this effect is statistically significant at 5% level of significance.

Hypotheses Development

To examine the determinant of internal audit effectiveness using tertiary institutions in Kwara State as evidence. This study focused on the following: top management support, internal audit remuneration, internal audit competence, information technology and external influences because these factors are more likely to influence internal audit effectiveness of tertiary institutions in Kwara State.

Top Management Support

The internal audit department receives support from top management when they provide internal auditors specific recognition, by allocating the necessary resources needed to ensure their objectivity, as well as the implementation of the recommendations from internal audit exercise (Sualiho, 2021). Delai and Omri, (2019) pointed out that management systems, sound internal control systems, and effective governance enhance the internal audit effectiveness, and the major goal behind forming the internal audit is to increase auditing quality, as well as to serve as a point of reference or starting point for external auditing exercise. Consequently, the following hypothesis was put out:

H_{01}: *Top management support does not significantly affect internal audit effectiveness of tertiary institutions in Kwara State.*

Internal Auditor Remuneration

Internal auditor remuneration refers to the financial compensation provided to individuals occupying internal audit roles within an organization. This includes salary, bonuses, and other monetary benefits (Jude & Paago, 2022). This covers the total rewards package offered to internal auditors, encompassing not only salary but also benefits such as healthcare, retirement plans, and other non-monetary perks. T This structure aims to attract, retain, and motivate internal audit professionals (Iliemena, et al., 2021). As a result of these, the study develops the following hypothesis:

H_{02}: *There is no significant relationship between internal auditor remuneration and internal audit effectiveness of tertiary institutions in Kwara State*

Internal Audit Competence

Internal audit competence encompasses the skills, knowledge, and proficiency possessed by individuals within the internal audit department (Mihret & Yismaw, 2019). The presence of expert members in the accounting or financial area among members of the internal audit exercise will increase the likelihood of the disclosure of inaccurate financial statements, because these individuals are required to observe the ethic code to maintain their reputation (Roselyn, 2019). Internal audit competence is a pivotal aspect affecting the efficacy of internal audits in higher education institutions. Consequently, the following hypothesis was put out:

H_{03}: Internal auditor competence does not significantly affect internal audit effectiveness of tertiary institutions in Kwara State.

Information Technology

Information Technology (IT) refers to all communication technologies, including the internet, wireless networks, cell phones, computers, software and other media applications and services enabling users to access information in a digital form (Lee, et al., 2019). The rapid evolution of technology introduces complexities for internal auditors in keeping pace with emerging risks and vulnerabilities. Issues such as cybersecurity threats, data integrity, and system reliability require specialized skills and resources for effective mitigation. Nevertheless, adapting internal audit practices to align with technological advancements is crucial for maintaining the integrity of financial processes and safeguarding against potential information technology-related risks. However, he following hypothesis was put out:

H_{04}: Information technology does not significantly affect internal audit effectiveness of tertiary institutions in Kwara State.

External Influences

External influences refer to the factors and pressures that originate from outside an organization and can affect its operations, decision-making processes, and overall performance. In the realm of internal audits within higher education institutions, external influences may include regulatory requirements, stakeholder expectations, political dynamics, and other external factors that can impact the independence and objectivity of internal audit functions (Lee, et al., 2019). internal auditors must be vigilant and adaptive to external influences to maintain effectiveness). As a result of these, the study develops the following hypothesis:

H_{05}: External influence has no significant impact on internal audit effectiveness of tertiary institutions in Kwara State.

Methodology

This study focused on tertiary institutions in Kwara State and investigated the determinants of their internal audit effectiveness. This research uses a survey research methodology. The population of this study includes 15 audit staff from 8 institutions in Kwara State. This makes a total of one hundred and twenty (120) staff altogether who are the study's target respondents. As at the time of this study, there are currently 1 federal university in the state (University of Ilorin), 1 state owned university (Kwara State University), 2 state owned polytechnics (Federal Polytechnic Offa and Kwara State Polytechnic) and 4 state colleges of education (Kwara State College of Health Technology, Kwara State College of Education Oro, Kwara State College of Education Lafiagi, and Kwara State College of Education, Ilorin). This is the study's sample population.

The study's sample was selected from the previously mentioned total population. There were 92 responders overall, making up the study's sample size. The Yamane (1967) statistical approach for calculating sample size was used to determine the study's sample size.

$$n = \frac{N}{1 + Ne^2}$$

Where;

n= Sample Size, N= Population of Study, e = level of significance

N = 120, e = 0.05 (5%), n= $120/1+120(0.05)^2$

n ≈ 92 staffs.

Data Collection Method, Validity and Reliability Test of the Instrument

The staff of the internal audit unit at each of the institutions included in the study was given a standard questionnaire, which was used to collect most of the data for this study. The questionnaire was designed on a 5-point Likert scale with Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly Disagree (1). The replies were categorized using an ordinal scale, with numbers assigned ranging from 4, 3, and 1

for each response.

Model Specification

This study investigated the determinant of internal audit effectiveness of tertiary institutions in Kwara State. To test the hypotheses to achieve the objective stated, this study adopted the model from the study of Angel (2020). The model of Angel (2020) was stated as:

$IAE = \beta_0 + \beta_1 COMP + \beta_2 SIZE + \beta_3 IC + \beta_4 MSUP + \beta_5 IND + \varepsilon$

Where:

IAE = internal audit effectiveness,

COMP = competence of the internal audit department

SIZE = size of the internal audit department,

IC = Internal Control,

MSUP = Management Support for internal audit,

IND = Independence of the internal audit department,

ε = Error term,

$\beta 0, \beta 1, \beta 2, \beta 3, \beta 4, \beta 5$= Regression coefficients.

However, for the purpose of this study, the model was modified to contain the proxies adopted in this study, and while the proxies or constructs not needed were deleted.

$IAE = \beta_0 + \beta_1 TMS + \beta_2 IAR + \beta_3 IAC + \beta_4 IT + \beta_5 EI + \varepsilon$

Where:

IAE = Internal Audit Effectiveness, TMS = Top Management Support

IAR = Internal Auditor Remuneration IAC = Internal Auditor Competence

IT= Information Technology EI= External Influences

ε = Error term, β_0, β_1, β_2, β_3, β_4, β_5= Regression coefficients.

Results and Discussion

Table 1 Summary Statistics

	IAE	**IAR**	**IAC**	**IT**	**TMS**
Mean	11.88043	12.20652	12.69565	12.48913	12.00000
Maximum	21.00000	23.00000	22.00000	23.00000	21.00000
Minimum	6.000000	6.000000	5.000000	6.000000	6.000000
Std. Dev.	4.564176	4.909148	5.578095	5.611007	4.590961

Source: Aurthor's Computation, 2024

Key: IAE represents Internal Audit Effectiveness; TMS stands Top Management Support; IAR represents Internal Auditor Remuneration; IAC stands Internal Auditor Competence; IT represents Information Technology and EI stands External Influences

The table 4.1 presents the descriptive statistics for Internal Audit Effectiveness (IAE) and its associated factors, including Internal Auditor Remuneration (IAR), Internal Auditor Competence (IAC), Information Technology (IT), and Top Management Support (TMS). Each statistic provides insights into the central tendency, variability, and range of responses. The mean values for the factors indicate average scores, with Internal Auditor Competence (IAC) having the highest average score of 12.70. This suggests that, on average, respondents rate the competence of internal auditors quite highly. Conversely, Internal Audit Effectiveness (IAE) has a slightly lower mean score of 11.88, indicating room for improvement in the overall effectiveness of internal audit processes. The mean scores for IAR, IT, and TMS fall between these values, reflecting relatively positive perceptions but also indicating areas where enhancements can be made. In conclusion, the generally high mean scores across all factors indicate positive perceptions, but the slightly lower mean for IAE suggests that there is potential to further enhance internal audit effectiveness.

The maximum values reveal the highest scores recorded for each factor. Internal Auditor Remuneration (IAR) and Information Technology (IT) both reached a maximum score of 23.00, indicating that some respondents rated these factors very highly. This shows that at their best, remuneration and IT support are highly effective

in enhancing audit processes. Internal Auditor Competence (IAC) had a maximum score of 22.00, while Internal Audit Effectiveness (IAE) and Top Management Support (TMS) had maximum scores of 21.00. In conclusion, the high maximum values suggest that there are instances of excellent practices and support within the organizations, setting a benchmark for others to aim for.

The minimum values indicate the lowest scores recorded. Internal Auditor Competence (IAC) had the lowest minimum score at 5.00, suggesting significant variability in perceived competence. The other factors had minimum scores of 6.00. This range indicates that while some organizations excel in these areas, others struggle significantly, leading to a broad spectrum of effectiveness and satisfaction. In conclusion, the wide range of minimum values highlights the disparities in how different organizations perceive and implement internal audit-related factors, indicating a need for standardization and improvement in the lower-performing entities.

The standard deviations reveal the variability in responses. Information Technology (IT) has the highest standard deviation at 5.61, indicating considerable variation in perceptions about IT's role in supporting internal audits. Internal Auditor Competence (IAC) follows with a standard deviation of 5.58. Internal Auditor Remuneration (IAR) has a standard deviation of 4.91, while Internal Audit Effectiveness (IAE) and Top Management Support (TMS) have standard deviations of 4.56 and 4.59, respectively. In conclusion, the variability indicated by the standard deviations suggests that while some organizations effectively leverage these factors, others do not, pointing to opportunities for sharing best practices and providing targeted support to ensure more consistent performance across all organizations.

Therefore, the analysis of the descriptive statistics for internal audit-related factors reveals generally positive perceptions, particularly regarding auditor competence. However, the variability in responses and the lower scores for some factors indicate areas for improvement. By addressing these disparities, organizations can enhance the effectiveness of their internal audit functions, ultimately contributing to better governance and organizational performance

Correlation Analysis

Table 2 Correlation Analysis

Correlation					
Probability	IAE	IAR	IAC	IT	TMS
IAE	1.000000				
IAR	0.939825	1.000000			
	0.0000	-----			
IAC	0.933463	0.901227	1.000000		
	0.0000	0.0000	-----		
IT	0.922293	0.923837	0.905382	1.000000	
	0.0000	0.0000	0.0000	-----	
TMS	0.793996	0.837181	0.653535	0.826738	1.000000
	0.0000	0.0000	0.0000	0.0000	-----

Source: Author's Computation, 2024

The table presents the results of a correlation analysis examining the relationships between Internal Audit Effectiveness (IAE) and several factors. The correlation between IAE and IAR is 0.939825, which is a very strong positive relationship, suggesting that higher internal auditor remuneration is associated with greater internal audit effectiveness. This implies that adequately compensating internal auditors likely enhances their performance, leading to more effective audit processes. In conclusion, the strong correlation between IAR and IAE underscores the importance of competitive remuneration for achieving high internal audit effectiveness. The correlation between IAE and IAC is 0.933463, another very strong positive relationship. This indicates that higher levels of internal auditor competence are strongly associated with increased internal audit effectiveness. Competent auditors are more capable of performing thorough and accurate audits, which enhances the overall effectiveness of the internal audit function. In conclusion, the significant correlation between IAC and IAE highlights the critical role of auditor competence in driving effective internal audit outcomes.

The correlation between IAE and IT is 0.922293, suggesting a strong positive relationship between the use of information technology and internal audit effectiveness. Effective use of IT tools can streamline audit processes, improve accuracy, and provide auditors with better data analysis capabilities, thereby enhancing the effectiveness of

internal audits. In conclusion, the strong correlation between IT and IAE indicates that leveraging advanced IT solutions is essential for maximizing internal audit effectiveness. The correlation between IAE and TMS is 0.793996, indicating a strong positive relationship, though slightly weaker than the previous correlations. This suggests that top management support is crucial for internal audit effectiveness, as support from the top management ensures that the audit function has the necessary resources, authority, and independence to operate effectively. In conclusion, the strong correlation between TMS and IAE emphasizes the importance of top management support in ensuring the effectiveness of internal audits.

Looking at the interrelationships among the other factors, we see strong positive correlations as well. For instance, IAR and IT have a correlation of 0.923837, suggesting that well-compensated auditors are more likely to work in environments that effectively use IT tools. Similarly, the correlation between IAR and IAC is 0.901227, indicating that higher remuneration is associated with greater auditor competence. The correlations between TMS and the other factors, while still strong, are slightly lower, with the lowest being between TMS and IAC at 0.653535.

Regression Analysis

Table 3 Regression Analysis

Dependent Variable: Internal Audit Effectiveness

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
IAR	0.218384	0.090048	2.425184	0.0174
IAC	0.471663	0.073202	6.443330	0.0000
IT	0.002551	0.077079	0.033093	0.9737
TMS	0.216761	0.065482	3.310245	0.0014
C	0.593661	0.383895	1.546417	0.1256
R-squared	0.934853			
Adjusted R-squared	0.931857			
F-statistic	312.1079			
Prob(F-statistic)	0.000000			

Source: Authors Computation, 2024

The regression analysis results, as presented in Table 4.1, provide a detailed examination of the impact of various factors on Internal Audit Effectiveness (IAE). The analysis includes the coefficients, standard errors, t-statistics, and p-values for each independent variable, alongside overall model fit statistics.

Internal Auditor Remuneration (IAR): The coefficient for IAR is 0.218384 with a standard error of 0.090048, yielding a t-statistic of 2.425184 and a p-value of 0.0174. This indicates a statistically significant positive relationship between IAR and IAE at the 5% significance level. A higher remuneration for internal auditors is associated with improved internal audit effectiveness, suggesting that competitive salaries contribute positively to the performance and effectiveness of internal audits. Internal Auditor Competence (IAC): The coefficient for IAC is 0.471663 with a standard error of 0.073202, resulting in a t-statistic of 6.443330 and a p-value of 0.0000. This demonstrates a highly significant positive relationship between IAC and IAE. The strong association underscores the critical role of auditor competence in enhancing internal audit effectiveness. More competent auditors contribute significantly to the quality and effectiveness of internal audits.

Information Technology (IT): The coefficient for IT is 0.002551 with a standard error of 0.077079, yielding a t-statistic of 0.033093 and a p-value of 0.9737. The p-value indicates that the relationship between IT and IAE is not statistically significant. Despite the presence of IT tools, they do not show a substantial impact on internal audit effectiveness in this model, suggesting that other factors might be more influential or that the IT tools used may not be optimally leveraged. Top Management Support (TMS): The coefficient for TMS is 0.216761 with a standard error of 0.065482, producing a t-statistic of 3.310245 and a p-value of 0.0014. This reflects a significant positive relationship between TMS and IAE. Strong support from top management is crucial for internal audit effectiveness, as it ensures that the internal audit function receives adequate resources and backing, which enhances its overall performance.

R-squared: The R-squared value of 0.934853 indicates that approximately 93.49% of the variability in internal audit effectiveness is explained by the model. This high value suggests that the model explains a significant portion of the variance in internal audit effectiveness, reflecting a strong overall fit. Adjusted R-squared: The adjusted R-squared value of 0.931857, which adjusts for the number of predictors in the model, confirms that the model remains robust even when accounting for the number of variables. F-statistic: The F-statistic of 312.1079 with a p-value of 0.000000 indicates that the model is statistically significant overall. This suggests that the combined effect of the independent variables on internal audit effectiveness is significant, providing confidence in the model's explanatory power.

The regression analysis reveals that Internal Auditor Remuneration (IAR), Internal Auditor Competence (IAC), and Top Management Support (TMS) have significant positive effects on Internal Audit Effectiveness (IAE). Higher remuneration and greater competence in auditors, along with strong top management support, contribute significantly to improving the effectiveness of internal audits. However, Information Technology (IT) does not show a significant impact in this analysis, which may imply that its role in enhancing internal audit effectiveness is either limited or requires better integration and usage. Overall, the high R-squared value indicates that the model provides a strong fit for explaining variations in internal audit effectiveness, underscoring the importance of these factors in achieving effective internal audits.

Post Estimation Test

Serial Correlation Analysis

Table 4 Breusch-Godfrey Serial Correlation LM Test:

F-statistic	103.2234	Prob. F(2,85)	0.4563
Obs*R-squared	65.16835	Prob. Chi-Square(2)	0.0678

The Breusch-Godfrey Serial Correlation LM Test results are summarized in the table, which assesses the presence of serial correlation in the residuals of the regression model. The key statistics provided are the F-statistic, the associated p-value for the F-statistic, the Obs*R-squared statistic, and its associated p-value.

F-statistic: The F-statistic is 103.2234. The p-value associated with this F-statistic is 0.4563. Since this p-value is much greater than the common significance levels (e.g., 0.01, 0.05, or 0.10), we fail to reject the null hypothesis of no serial correlation in the residuals. This indicates that there is no significant evidence of serial correlation in the regression model's residuals based on the F-statistic. Conclusion: Based on the results of the Breusch-Godfrey Serial Correlation LM Test, the p-value for the F-statistic indicates no significant evidence of serial correlation in the residuals of the regression model. Therefore, overall, the test results suggest that serial correlation is not a major concern for the regression model under the given significance levels.

Heteroskedasticity

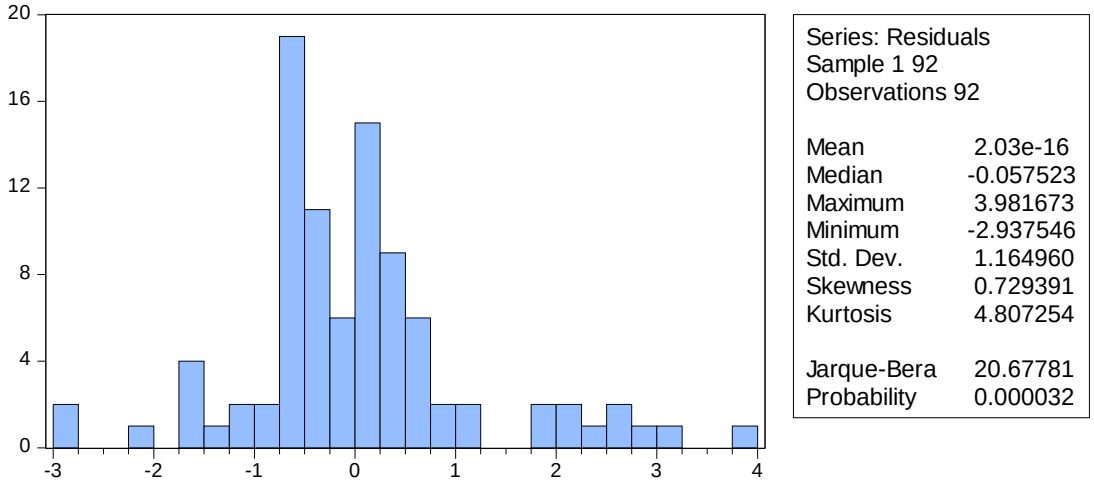
Table 5 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	4.017318	Prob. F(4,87)	0.0949
Obs*R-squared	14.34349	Prob. Chi-Square(4)	0.0363
Scaled explained SS	24.41740	Prob. Chi-Square(4)	0.0001

The Breusch-Pagan-Godfrey Heteroskedasticity Test results are summarized in the table, which examines whether the variance of the errors in the regression model is constant (homoskedasticity) or varies with the level of an independent variable (heteroskedasticity). F-statistic: The F-statistic is 4.017318 with a p-value of 0.0949. This p-value is slightly higher than the common significance level 0.05. This indicates that the null hypothesis of homoskedasticity, suggesting that heteroskedasticity present will be rejected Conclusion: The results of the Breusch-Pagan-Godfrey Heteroskedasticity Test is absent in the regression model.

Normality Test

Figure 1: Normality Test



The histogram and accompanying statistics of the residuals from the regression analysis provide insights into their distribution and characteristics. The histogram of the residuals shows a roughly bell-shaped distribution centered around zero, which is typical for residuals in a well-fitted regression model. The bars are highest around the mean, indicating that most residuals are close to zero, with fewer residuals as we move

away from the mean in both directions. There are some residuals on the extreme ends, both positive and negative, but they are relatively fewer, suggesting some level of normal distribution.

Conclusion and Recommendations

An analysis of internal audit effectiveness (IAE) highlights key factors influencing audit success: internal auditor remuneration (IAR), competence (IAC), and top management support (TMS). Strong positive correlations show that higher remuneration boosts motivation, competence ensures thorough audits, and management support fosters independence and resource allocation. Regression analyses confirm statistically significant positive impacts of IAR and IAC, underscoring the importance of competitive pay and continuous training. While IT correlates positively with IAE, its regression impact is insignificant, suggesting integration challenges. Prioritizing these factors ensures effective audits, skilled auditors, and robust organizational support for enhanced audit reliability. The study recommends competitive remuneration to attract and retain skilled auditors, continuous training for enhanced competence, and strong top management support to ensure resource availability. Additionally, optimizing IT utilization through effective integration and auditor training is advised to improve audit processes and maximize its benefits, despite its limited direct impact on audit effectiveness.

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