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FACTORS AFFECTING INTERNAL AUDIT EFFECTIVENESS WITH APPLICATION OF COMPUTER-ASSISTED AUDIT TECHNIQUES AS A MODERATING VARIABLE

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Abstract

Driven by the internal audit ineffectiveness and fraud cases occurrence in various ministries/agencies, this quantitative study examines contribution of competence, independence, managerial support, communication and the use of Computer-Assisted Audit Techniques to internal audit effectiveness in the Ministry of Finance Inspectorate General, using Computer-Assisted Audit Techniques as a moderating variable. Data was obtained through purposive sampling survey with a questionnaire and analyzed with SmartPLS 3.0 software. The findings reveal that competence, independence, management support, communication and the use of Computer-Assisted Audit Techniques all have positive and significant impacts on internal audit effectiveness. In addition, Computer-Assisted Audit Techniques use moderates the association between competence and internal audit effectiveness, but has no effect on the associations between independence, management support, or communication and internal audit effectiveness. This study suggests improving internal auditor competence, independence, management support, communication, and the best practice implementation of Computer-Assisted Audit Techniques based on organizational requirements.

Key Words: Internal Audit Effectiveness, Computer Assisted Audit Techniques, Auditor Competence, Auditor Independence, Management Support to Internal Audit.

Abstrak

Didorong oleh ketidakefektifan audit internal dan terjadinya kasus-kasus kecurangan di berbagai kementerian/lembaga, penelitian kuantitatif ini mengkaji kontribusi kompetensi, independensi, dukungan manajerial, komunikasi, dan penggunaan Teknik Audit Berbantuan Komputer terhadap efektivitas audit internal di Inspektorat Jenderal Kementerian Keuangan, dengan penggunaan Teknik Audit Berbantuan Komputer sebagai variabel moderasi. Data diperoleh melalui survei purposive sampling dengan kuesioner dan dianalisis menggunakan perangkat lunak SmartPLS 3.0. Temuan penelitian menunjukkan bahwa kompetensi, independensi, dukungan manajemen, komunikasi, dan penggunaan Teknik Audit Berbantuan Komputer memiliki dampak positif dan signifikan terhadap efektivitas audit internal. Selain itu, penggunaan Teknik Audit Berbantuan Komputer memoderasi hubungan antara kompetensi dan efektivitas audit internal, tetapi tidak memengaruhi hubungan antara independensi, dukungan manajemen, atau komunikasi dengan efektivitas audit internal. Penelitian ini menyarankan untuk peningkatan kompetensi auditor internal, independensi, dukungan manajemen, komunikasi, serta penerapan praktik terbaik penggunaan Teknik Audit Berbantuan Komputer yang sesuai dengan kebutuhan organisasi.

Key Words: Efektivitas Audit Internal, Teknik Audit Berbantuan Komputer, Kompetensi Auditor, Independensi Auditor, Dukungan Manajemen terhadap Audit Internal.

INTRODUCTION

Government Internal Supervisory Apparatus/GISA (or Aparat Pengawasan Intern Pemerintah/APIP) ensures responsible financial management in government programs during times of crisis, including COVID-19 response and national economic recovery. This was underscored by President Joko Widodo during the 2020 National Coordination Meeting on Government Internal Supervision on 15 June 2020. GISA is composed of internal audit departments in ministries/ agency, provincial and local governments, and the Financial and Development Supervisory Agency (Badan Pengawasan Keuangan dan Pembangunan/BPKP). These units conduct both assurance and consulting functions of internal supervision. With the public demand for greater accountability and transparency from government, GISA's role in internal audits and other oversight activities plays a significant part in increasing accountability for government programs. Effective internal audits are crucial for identifying organizational shortcomings before external auditors disclose them, as they provide an opportunity for correction and improvement. As Alzeban & Gwilliam (2014) highlighted, effective internal audits in the public sector strengthen governance and enhance public trust by mitigating risks and ensuring responsible resource management. Conversely, ineffective audits undermine organizational effectiveness, erode the quality of public service delivery, and lead to wasteful expenditure of public funds without generating significant outcomes (Alzeban & Gwilliam, 2014; Goodson et al., 2012). GISA has an essential role in improving internal controls (Government Regulation Number 60 of 2008). When effectively implemented, internal audits are not only instrumental in identifying organizational vulnerabilities but also serve as a deterrent to fraud and misconduct. This assertion aligns with findings from studies that illustrate how robust internal control systems mitigate fraud risks and enhance governance integrity (Kurniawan et al., 2024; Lubis et al., 2024).

The Ministry of Finance Inspectorate General (MOFIG), as the GISA for the Ministry of Finance, conducts audits, reviews, assessments, surveillance, and other oversight activities to ensure the ministry's operations are aligned with governance principles. These include taxation, customs and excise, state assets, treasury, budget, and fiscal balance management (MOF Regulation Number 124 of 2024). Moreover, as one of the pioneering government agencies in bureaucratic reform, the Ministry of Finance's transformations have served as a model for other government departments. Research has also shown that enhancing the capabilities of internal auditors and integrating technological advancements, such as ERP systems, can bolster internal controls and improve governance frameworks (Widyaningdyah & Ezra, 2020; Napitupulu, 2023).Internal audits are effective because they are correlated to strategic goals such as strengthening governance, enhancing organisational effectiveness, remediating internal weaknesses, offering confidence and strengthening internal controls. Yet, as important as it is, there is no single metric for internal audit effectiveness – especially in the public sector. Previous research has proposed a variety of measures, including customer satisfaction Alzeban & Gwilliam (2014) or conformity with relevant audit guidelines (Dellai & Slimene, 2021). This research seeks to make an effort by creating a methodology for the assessment of internal audit effectiveness in the public sector.

Previous studies reported various aspects of internal audit effectiveness. Alzeban & Gwilliam (2014) and Baharud-din et al. (2014) suggest that auditor competence, independence, and management support have a positive effect on audit performance. Yet opposite conclusions by Takie & Yiadom (2016) suggest that management support might have little to no impact on audit performance. Studies on internal audits in the public sector are less well-understood than in the private sector and Alzeban & Gwilliam (2014) recommend more research.

This study focuses on three variables (competence, independence, and management support) while introducing additional variables (for example, internal auditor communication with clients, and CAATs) as a corollary of auditor competence in improving internal audit effectiveness. The purpose of this study is to explore positive impacts of the independent variables (auditor competence and independence, management assistance, and audit communication) on the dependent variable (internal audit effectiveness) of MOFIG. It also investigates whether the introduction of CAATs moderates the association between auditor quality and internal audit efficiency. This study contributes filling research gaps by analysing non-studied factors, such as auditors and customers communication as an independent variable, and CAATs as a moderating factor. The results also provide empirical evidence on whether auditor competence and independence, management assistance, and audit communications affect internal audit effectiveness and whether CAATs strengthen the connection between auditor competence and audit effectiveness.

LITERATURE REVIEW AND HYPOTHESIS

Agency Theory

Agency theory arises when a principal (owner) engages an agent (management) to perform functions on their behalf, often leading to agency conflicts due to differing interests between the two parties. These conflicts are further exacerbated by information asymmetry, where the agent typically possesses more information than the principal. In the framework of agency theory, auditing serves as a critical mechanism to resolve agency conflicts by reducing information asymmetry and ensuring the independence of auditors. As Goodson et al. (2012) and Alzeban & Gwilliam (2014) suggest, the greater the extent of information asymmetry, the stronger the need for monitoring functions such as internal auditing. Internal auditors, therefore, play a pivotal role in enhancing governance and aligning the interests of principals and agents (Asiedu & Deffor, 2017).

Institutional Theory

Institutional theory relies on the concept that organizations are structured to achieve social objectives and ensure accountability. Internal auditors, in this sense, focus on strengthening governance models within the institutional framework. Internal audit is regarded as a crucial control mechanism and a fundamental component of the risk management framework. This theory emphasizes the necessity for management to support internal auditors in their activities to enhance corporate governance and fulfill organizational goals (Endaya & Hanefah, 2016; Goodson et al., 2012). Furthermore, the theory posits that the operational environment of organizations is characterized by rules and regulations that must be adhered to in order to secure legitimacy and support.

Public Sector Internal Audit

Internal audit is referred to in the Indonesian Government Internal Audit Standard (Standar Audit Internal Pemerintah Indonesia, SAIPI) and the Institute of Internal Auditors (IIA) as an independent, objective assurance and consulting function that aims to provide value and support organizational performance. Government Regulation No. 60 of 2008 defines internal supervision as comprising audit, review, evaluation, monitoring, and other forms of oversight that provide sufficient confidence that activities are conducted efficiently and effectively to ensure good governance. Public sector internal auditing is mandated, for instance, due to agency issues. Like the private sector, public sector auditing focuses on agency conflicts between the public (as principal) and public managers (as agents) who manage public assets and programs. This dynamic necessitates a robust internal audit function to mitigate conflicts of interest and ensure accountability in managing public resources (Dzomira, 2020; Hay & Cordery, 2018; Sarens & Abdolmohammadi, 2011). Internal auditors are instrumental in delivering independent and impartial financial, resource, and organizational performance as well as public accountability, which helps to safeguard the public's confidence (Dzomira, 2020).The Ministry of Finance Inspectorate General (MOFIG) audits the internal operations at the Ministry of Finance. MOFIG internal auditors are appointed in the functional position of auditors according to Ministry of Administrative and Bureaucratic Reform Regulation No. 220 of 2008. Audits are conducted by eight Inspectorates under the supervision of an Inspector (echelon II officer). Each team audit report is approved by the Inspector and forwarded to the Minister of Finance through MOFIG.

Effectiveness of Internal Government Audits

An internal audit is deemed successful if it succeeds in delivering the desired value to the organization and operational excellence. Good internal audits also help the organisational management to fulfil their roles and responsibilities more effectively as well as evaluate and optimise risk management and internal control processes. Internal audits meeting these standards are conducive to better governance, by strengthening public confidence in public institutions' accountability (Goodson et al., 2012). Internal audits have been assessed in various ways. These include internal audit's responsiveness to client needs (Alzeban & Gwilliam, 2014), client satisfaction with audit execution, number of audit recommendations implemented by clients, and internal audit procedures' adherence to relevant standards. Good internal audits are vital to good governance, public confidence and effective use of public resources in the public sector.

Previous Research

Earlier studies have revealed some factors that determine the internal audits effectiveness. Alzeban & Gwilliam (2014) and Baharud-din et al. (2014) found that internal auditor capability positively impacts internal audit effectiveness. Takie & Yiadom (2016) found a positive association between professional competence and audit performance, and Badara & Saidin (2014) reported a positive association between audit experience and internal audit effectiveness. Laurencia (2015), however, did not found association between internal auditor competence and internal audit effectiveness. Shamki & Alhajri (2017), in similar vein, found no significant correlation between

auditor competence and audit performance in managerial samples. This discrepancy of findings suggests more study is needed in understanding how auditor competence and internal audit effectiveness interact.
Auditors' independence has also been examined. Asiedu & Deffor (2017), Alzeban & Gwilliam (2014), Takie & Yiadom (2016), and Baharud-din et al. (2014) found a strong correlation between auditor independence and internal audit effectiveness. However, Laurencia (2015) did not find any significant association between auditor independence and audit performance, suggesting that further studies are required to reconcile these differences.
Management support has been identified as another determinant of the success of internal audits. Baharud-din et al. (2014) and Alzeban & Gwilliam (2014) identified management support to positively affect audit quality. However, Takie & Yiadom (2016) found that top management support has no significant impact on audit performance, which Shamki & Alhajri (2017) supported by noting that no significant correlation existed between management response and internal audit effectiveness. These incongruent findings require further research on management assistance.
Endaya & Hanefah (2016) highlighted communication as a major auditors' trait that enhances audit performance. Laurencia (2015) similarly concluded that auditors' and clients' communication positively influences audit performance.
Technically, Fauzi (2020) determined that CAATs have an impact on the success of investigative audits for detecting fraud. Atmaja (2016) also discovered that CAATs had a positive effect on auditors' suspicion of fraud, which supports the idea that CAATs promote audit effectiveness. Ayu et al. (2015) argued that CAATs enhanced audit quality. But, Atmaja (2016) pointed out that the use of CAATs reduces the impact of audit experience on auditor fraud detection – which would support the hypothesis that CAATs mitigate auditor competence's influence on audit effectiveness. Butar (2016) also highlighted the need to have expertise in technology and information systems in order to conduct effective and efficient audits.

Relationships Between Variables (Conceptual Framework)

Conceptual framework describes the correlations between independent factors and the effectiveness of internal audits at MOFIG, with CAATs acting as a moderator. This conceptual framework is shown in Figure 1.

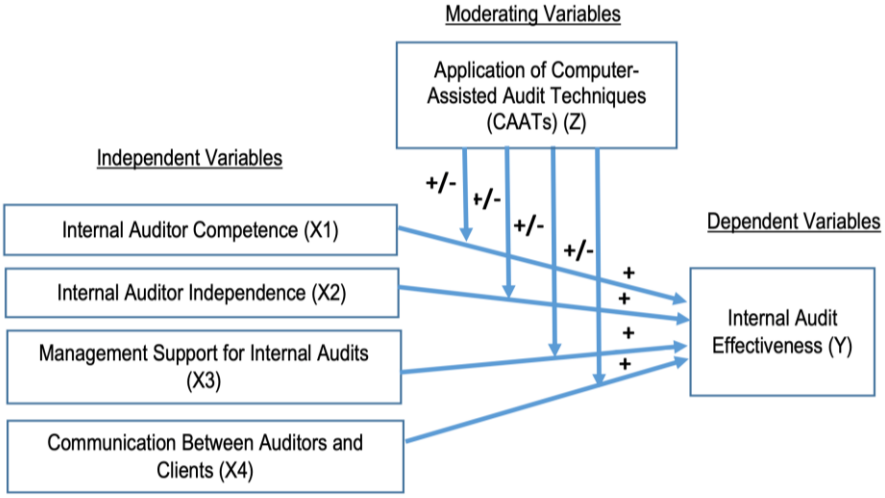

Figure 1. Conceptual Framework

Source: Author Illustration, 2023

The model distinguishes 6 variables, 1 dependent variable, 4 independent variables and 1 moderating variable. Internal auditor competence, auditor independence, management assistance, and interaction between internal auditors and the clients are all expected to have an impact on internal audit effectiveness. It is believed that CAATs can temper (distribute or reduce) these effects on internal audit effectiveness.

Hypothesis

The hypothesis for this study are as follows:
H1: Internal auditor competence positively influences internal audit effectiveness.
H2: Internal auditor independence positively influences internal audit effectiveness.
H3: Management support positively influences internal audit effectiveness.
H4: Communication between internal auditors and clients positively influences internal audit effectiveness.

H5: The application of CAATs strengthens the effect of internal auditor competence on internal audit effectiveness.
H6: The application of CAATs moderates (strengthens or weakens) the effect of internal auditor independence on internal audit effectiveness.
H7: The application of CAATs moderates (strengthens or weakens) the effect of management support on internal audit effectiveness.
H8: The application of CAATs moderates (strengthens or weakens) the effect of communication between internal auditors and clients on internal audit effectiveness.

METHODOLOGY

Research Approach, Population, and Sample

This is an empirical study utilizing a quantitative survey questionnaire. The research is intended to provide evidence on the associations between independent variables and internal audit effectiveness at the MOFIG. The participants for this study are all MOFIG's internal auditors – 395 working auditor officers. Slovin's formula determined the sample size (from 395 population with 0.05 margin of error), and it was 199 respondents.

Operationalisation of Variables

The dependent variable is internal audit effectiveness, a concept used in the public sector to mean whether audits achieve value for organisational performance, efficiency, governance and bureaucratic reform. Internal audit effectiveness is classified into three areas – internal audit operations (statements 1–8), internal audit outputs (9–11), and internal audit impacts (12–15). Effectiveness is measured using a set of questionnaire questions from previous research by Dellai & Slimene (2021) and Alzeban & Gwilliam (2014), giving 15 indicators.
Internal Auditor Competence is the technical proficiency of the internal auditor. This includes school credentials (Alzeban & Gwilliam, 2014; Baharud-din et al., 2014), certifications in auditing (Alzeban & Gwilliam, 2014), work experience in auditing (Alzeban & Gwilliam, 2014; Baharud-din et al., 2014), internal audit expertise (Ahmad et al., 2009), and ongoing training (Alzeban & Gwilliam, 2014; Baharud-din et al., 2014). Competence can be defined in four areas – education level, certifications, audit experience, and ongoing training/workshops (in terms of the number of training sessions and hours completed annually). The metric follows Alzeban & Gwilliam (2014). In the education system, a 4 point system applies: 2 for a diploma (D3), 3 for a bachelor's degree (S1), 4 for a master's or doctoral degree (S2/S3). Certifications are rated by the total number of national or international audit certifications, 1 point per certification and 4 points for four or more certifications. Scores across all items are combined to calculate one internal auditor score.
Internal Auditor independence involves the auditor not being influenced by an external party or conflict of interest that would undermine objectivity. Independence consists of seven items along four dimensions: access to and communication with senior management, conflict of interest, audit process intervention, and non-audit functions. Those dimensions are derived from previous research by Alzeban & Gwilliam (2014) and Fauzi (2020). A 4-point Likert scale measures responses on a statement from 1 ("strongly disagree") to 2 ("disagree"), 3 ("agree"), and 4 ("strongly agree"). The scores for all items are summed to give a single auditor-independence score.
Management Assistance for Internal Audits include resources to support auditors, engagement in planning audits (Alzeban & Gwilliam, 2014), and authority at the top. Four indicators of management assistance are: enabling resources to do audit work; management involvement in planning audit; response to audit reports; and allocation of resources to internal audit team (see Alzeban & Gwilliam, 2014). All responses are rated on a 4-point Likert scale and the sum of the 5tem sis used to calculate the overall score for management assistance.
Communicating effectively also requires maintaining a professional rapport between internal auditors and the clients (Endaya & Hanefah, 2013). Communication is quantified by six factors based on auditor attitudes, communication, client response to feedback and two-way relationship quality. These measures are based on studies from Endaya & Hanefah (2013) and have a 4-point Likert scale. The average score of all 5tem sis the communication variable. The Use of CAATs are applied through the utilization of computer programs and data analysis tools in audits. The measurement of CAATs usage encompasses eight indicators outlined in the questionnaire, which are adapted from Fauzi (2020). All responses are recorded on a 4-point Likert scale, and the average of these items constitutes the CAATs variable score. It is the average of each statement's score that determines the effectiveness of internal audits. This allows for a detailed assessment of the effects of these variables on the dependent variable.

Data and Data Collection Techniques

This research uses initial data gathered through a questionnaire sent to internal auditors in Ministry of Finance Inspectorate General of the Ministry of Finance (MOFIG). To collect this information, the questionnaire contains closed-ended statements asking individuals to rate how much they agree or disagree. The statements cover all research variables: the dependent variable of internal audit effectiveness (EAI); the independent variables of internal auditor competence (KOMP), internal auditor independence (IND), management support for internal audits (DUK), and internal auditor-client communication; and the moderating variable, use of CAATs.

Data Analysis

This study uses SEM with PLS algorithm, SmartPLS software (Ghozali & Latan, 2015). PLS is a non-parametric statistical approach which takes account of both nominal and ordinal data, interval and ratio scales, without making any distributional assumptions. That versatility makes it ideal for complex models with latent variables. Data analysis starts with the measurement model (or outer model), which evaluates the validity and trustworthiness of indicators associated with their respective latent constructs. Convergent validity can be calculated from factor loadings where an amount of 0.5 and above is acceptable, while an amount of 0.7 and above is strongly valid. We also analyse Average Variance Extracted (AVE), where the value of 0.5 or more is validated. The discriminant validity is measured using the Heterotrait-Monotrait Ratio (HTMT), and should be lower than 0.85 (although this may be up to 0.90). Reliability checks that the build is correct and uniform using Cronbach's Alpha and Composite Reliability — both tests require a value greater than 0.70 to be considered satisfactory.

Structural model, or inner model, compares latent variable relations with substantive theory. Model fit can be calculated by using R-squared values of dependent latent variables, which define how much independent variables account for the dependent variable variance. R-squared values are between 0 and 1, higher the R-squared the more explanatory power. This predictive relevantness is also measured by Q-squared values where a value above 0 indicates predictive power, and larger values indicate more relevance. Among the Q-squared numbers, there are certain guidelines for their interpretation: from 0 to 0.25, we expect very low predictive power; from 0.25 to 0.5, we expect moderate predictive power; from 0.5 to 0.75, we expect strong predictive ability; and from 0.75 to 0.99, we expect very strong predictive ability.

Lastly, hypothesis testing is performed with T-statistics based on path coefficients. Hypothesis is confirmed if the T-statistics value exceeds the threshold T-table value of 1.96 (at 5% significance). This process confirms the existence and importance of relationships between latent variables, and this analysis enables the research to conclude well about the relationships it examines.

FINDINGS AND DISCUSSION

Questionnaire Results and Respondent Profile

A total of 208 responses were obtained from the circulated questionnaires, 52.66% of the total number of internal auditors at the Ministry of Finance Inspectorate General of the (MOFIG). So, the minimum sample size required (Slovin's formula for a sample of 395 with a 0.05 margin of error) was 199 respondents. So the 208 respondents exceeded the minimum. These are the respondent internal auditors of MOFIG. Table 1 describes demographic details of respondents.

Table 1.
Respondent Demographics

Sample Profile		Frequency	Percentage
Gender	Male	162	77.88%
	Female	46	22.12%
	TOTAL	208	100.00%
Roles in Audit Engagement	Quality Controller (Pengendali Mutu)	12	5.77%
	Technical Controller (Pengendali Teknis)	18	8.65%
	Team Leader (Ketua Tim)	72	34.62%
	Team Member (Anggota (Tim)	106	50.96%
	TOTAL	208	100.00%

Sample Profile		Frequency	Percentage
Position	Chief Auditor (Auditor Utama)	4	1.92%
	Audit Manager (Auditor Madya)	24	11.54%
	Lead Auditor (Auditor Muda)	72	34.62%
	Senior Auditor (Auditor Pertama)	82	39.42%
	Junior Auditor (Auditor Penyelia)	4	1.92%
	Senior Audit Staff (Auditor Pelaksana Lanjutan)	16	7.69%
	Junior Audit Staff (Auditor Pelaksana)	6	2.88%
	TOTAL	208	100.00%
Education Level	Associate Degree (Diploma III)	10	4.81%
	Bachelor's Degree (S1)	124	59.62%
	Master's Degree (S2)	74	35.58%
	TOTAL	208	100.00%
Professional Auditor Certifications	Chartered Accountant (CA)	24	11.54%
	Certified Fraud Examiner (CFE)	10	4.81%
	Certified Internal Auditor (CIA)	10	4.81%
	Other Certificates	164	78.84%
	TOTAL	208	100.00%
Pengalaman Kerja Sebagai Auditor	Up to < 5 years	48	23.08%
	5 years to < 10 years	68	32.69%
	10 years to < 15 years	54	25.96%
	15 years or more	38	18.27%
	TOTAL	208	100.00%

Source: Data processed, 2023

Descriptive Analysis of Research Constructs

The descriptive statistics used to interpret the data are averages, minimum and maximum values and standard deviations (Ghozali, 2016). Survey responses were gathered using a Likert scale from 1 to 4 and descriptive data was divided into intervals to label responses. The classification intervals are as follows:

$$Interval = \frac{m - n}{b}$$

$$Interval = \frac{4 - 1}{4} = 0{,}75$$

where m = Highest value, n= Lowest value, b = Number of class intervals.

Table 2.
Descriptive Statistics Scale

Interval	Category
1 to1,75	Strongly Disagree
1,76 to 2,5	Disagree
2,51 to 3,25	Agree
3,26 to 4	Strongly Agree

Source: Data processed, 2023

Internal Audit Effectiveness (Y)

The internal audit effectiveness variable was descriptively described with three dimensions — internal audit process, internal audit output, and internal audit impact. There are indicators of each dimension, and you rate the responses using a Likert scale. Table 3 shows the findings. The average internal audit effectiveness score was

3.611, meaning that people "strongly agree" with the statements. The median was highest for EAI_3 (3.740) which involves compliance review. The lowest median was for EAI_15 (3.471), which refers to client satisfaction.

Table 3.
Descriptive Results for Internal Audit Effectiveness Variable

Dimension	Indicator	Item	Mean	Classification
Internal Audit Process	Internal auditors review operational activities and programs to ensure that the outcomes are consistent with the established goals and targets.	EAI_1	3,697	Strongly Agree
	Internal auditors determine the accuracy and effectiveness of task implementation, organisational functions, and internal operational controls within the organisation.	EAI_2	3,663	Strongly Agree
	Internal auditors review compliance with policies, plans, procedures, and applicable laws and regulations.	EAI_3	3,740	Strongly Agree
	Internal auditors evaluate and improve the effectiveness of governance, risk management, and internal control.	EAI_4	3,702	Strongly Agree
	Internal auditors review the economy, efficiency, and effectiveness of resource usage.	EAI_5	3,500	Strongly Agree
	Issues to be audited are decided after identifying risks, quantifying them, and establishing the appropriate risk level.	EAI_6	3,577	Strongly Agree
	All audit functions approved in the audit plan are executed in full.	EAI_7	3,534	Strongly Agree
	Internal auditors carry out adequate follow-ups to ensure corrective actions have been taken by audit clients.	EAI_8	3,615	Strongly Agree
Internal Audit Output	Internal audit reports are well-prepared, accurate, and of high quality.	EAI_9	3,663	Strongly Agree
	Internal audit findings are based on reliable documents and data.	EAI_10	3,726	Strongly Agree
	Internal audit results provide applicable and appropriate solutions to address identified issues.	EAI_11	3,615	Strongly Agree
Internal Audit Impact	Internal audit findings and reports significantly impact decision-making processes by the management of audit clients.	EAI_12	3,582	Strongly Agree
	Internal audit results are fully implemented by the audit clients.	EAI_13	3,490	Strongly Agree
	Internal audits serve as valuable sources of data and information for decision-makers within the audit clients' work units.	EAI_14	3,601	Strongly Agree
	Internal audit work and activities align with the expectations of audit clients.	EAI_15	3,471	Strongly Agree
	Total		3,611	Sangat Setuju

Source: PLS Output, 2023, processed

Internal Auditor Competence (X1)

The four areas for internal auditor ability were education, professional training, work experience, and ongoing learning. The sizes and indicator values are described in Table 4. The median auditor competence score was 3.478, which means that respondents are pretty much in agreement. Education level (KOMP1) scored the highest on average (3.649), while lowest was for the number of short courses (KOMP5) (3.231).

Table 4.
Descriptive Results for the Internal Auditor Competence Variable

Dimension	Indicator	Item	Mean	Median	Max
Educational qualifications	Education Level	KOMP1	3,649	4	4
Professional qualifications	Number of certifications related to auditing	KOMP2	3,351	3	4
Work experience	Work experience in internal auditing	KOMP3	3,587	4	4
Continuous development	Annual training hours	KOMP4	3,572	4	4
	Number of short courses/workshops attended	KOMP5	3,231	3	4
	Total		3,478	3	4

Source: PLS Output, 2023 (processed)

Internal Auditor Independence (X2)

The independence of internal auditors was analyzed in terms of four parameters: audit intrusion, access and contact with senior management, conflict of interest, and non-audit functions. Each dimension is measured by various indicators (Table 5). The mean score (2.829 overall) means that participants generally "accept" the independence of internal auditors. Its highest score was for not including meaningful omissions in the reports (IND8), and its lowest score was for having direct access to senior leadership (IND2).

Table 5.
Descriptive Results for the Internal Auditor Independence Variable

Dimension	Indicator	Item	Mean	Classification
Intervention in the audit process	The preparation of audit programs is free from interference by external parties regarding the internal audit activities.	IND1	2,841	Agree
	No intervention from audit clients occurs during the execution of internal audit work.	IND4	2,587	Agree
	Internal audit reporting is free from obligations to modify facts reported to specific parties.	IND7	3,250	Agree
	Internal audit reporting avoids practices that omit significant issues from the report.	IND8	3,269	Strongly Agree
Access and contact with Senior management	The audit team has direct contact and relationships with top management.	IND2	2,346	Disagree
	Auditors have free access to all work units, employees, data, information, and locations within the audited entity.	IND5	2,582	Agree
Conflict of interest	No conflicts of interest occur during internal audit work.	IND3	2,572	Agree
Non-audit functions	No non-audit functions are performed related to internal audit assignments, such as designing systems and developing procedures in the audited organisation.	IND6	3,183	Agree
TOTAL			2,829	Setuju

Source: PLS Output, 2023 (processed)

Internal Audits Management Support (X3)

This management support was evaluated on two dimensions (audit execution support and audit outcomes support). The findings are presented in Table 6. With an average score of 3.555, the consensus was that management supports internal audits well, with the highest score for top management supports internal audits in carrying out their duties and responsibilities. (DUK1).

Table 6.
Descriptive Results for the Management Support Variable

Dimension	Indicator	Item	Mean	Classification
Supports on Audit implementation	Top management supports internal audits in carrying out their duties and responsibilities.	DUK1	3,683	Strongly Agree
	Management cooperates by providing documents required by internal auditors during the audit process.	DUK3	3,514	Strongly Agree
	Management provides facilities needed by internal auditors to carry out work during the audit process.	DUK4	3,481	Strongly Agree
Supports on Audit outcomes	The audit client management's response to internal audit reports is positive.	DUK2	3,572	Strongly Agree
	Management implements internal audit recommendations appropriately.	DUK5	3,524	Strongly Agree
TOTAL			3,555	Sangat Setuju

Source: PLS Output, 2023 (processed)

Communication between Auditors and Clients (X4)

Communication was measured on three dimensions: attitude and relationship work, adjusting to feedback, and communicating information. Table 7 summarises the results.

Table 7.
Descriptive Results for the Communication between Internal Auditors and Audit Clients Variable

Dimension	Indicator	Item	Mean	Classification
Attitudes and working relationships	Auditors avoid blame-shifting attitudes and tendencies to find faults/weaknesses in audit clients.	KOMU1	3,380	Strongly Agree
	A good working relationship exists between auditors and audit clients during the internal audit process.	KOMU5	3,538	Strongly Agree
Handling feedback	Auditors request and listen to feedback from audit clients.	KOMU3	3,649	Strongly Agree
	Auditors respond well to feedback from audit clients.	KOMU4	3,630	Strongly Agree
Delivering information	Auditors can clearly and understandably deliver important information related to internal audits.	KOMU2	3,567	Strongly Agree
	Auditors successfully convince audit clients regarding points of advice and recommendations from the internal audit results.	KOMU6	3,615	Strongly Agree
TOTAL			3,563	Strongly Agree

Source: PLS Output, 2023 (processed)

Overall mean rating of 3.563 indicates high consensus for good auditor/client communication. The highest was for auditors taking feedback (KOMU3).

Utilization of Computer-Assisted Audit Techniques (CAATs) (Z)

They evaluated use of the CAATs in four aspects: sampling audit, calculation, data analysis and testing, and reporting. Table 8 presents the results. CAATs application score average was 3.109. The highest was in accuracy on arithmetic (TABK3), and the lowest was in use of CAATs when preparing reports (TABK4).

Table 8.
Descriptive Results for the Implementation of Computer-Assisted Audit Techniques (CAATs)

Dimension	Indicator	Item	Mean	Classification
Audit sampling	CAATs are used for selecting samples based on predetermined criteria.	TABK1	3,505	Strongly Agree
	CAATs are used for data stratification.	TABK5	3,519	Strongly Agree
Data calculations	CAATs are used to calculate ratios and detect data that does not meet specific criteria.	TABK2	3,553	Strongly Agree
	CAATs are used to check arithmetic/calculation accuracy (e.g., addition).	TABK3	3,663	Strongly Agree
Data analysis and testing	CAATs are used to trace transactions through computerised systems.	TABK6	3,534	Strongly Agree
	CAATs are used to test data to ensure systems process data correctly and test application controls within systems.	TABK7	3,519	Strongly Agree
	CAATs are used to perform data analytics in carrying out audit procedures.	TABK8	3,577	Strongly Agree
Reporting	CAATs are used to prepare audit reports.	TABK4	3,173	Agree
TOTAL			3,505	Strongly Agree

Source: PLS Output, 2023 (processed)

Data Analysis Results

Outer Model Evaluation

The outer model links each indicator to its respective latent variable. Table 9 illustrates the Outer Loading and Cross Loading Results for the research variables.

Table 9.
Outer Loading and Cross Loading Result

Panel A: Outer Loading Result

Variable	Indicator	Loading Factor
Internal Audit Effectiveness (Y)	EAI1	0.838
	EAI2	0.736
	EAI3	0.833
	EAI4	0.816
	EAI5	0.762
	EAI6	0.828
	EAI7	0.818
	EAI8	0.773
	EAI9	0.819
	EAI10	0.860
	EAI11	0.848
	EAI12	0.760
	EAI13	0.780
	EAI14	0.806
	EAI15	0.755
Internal Auditor Competence (X1)	KOMP1	0.835
	KOMP2	0.791
	KOMP3	0.901
	KOMP4	0.837
	KOMP5	0.773
Internal Auditor Independence (X2)	IND1	0.718
	IND2	0.705
	IND3	0.873
	IND4	0.864
	IND5	0.858
	IND6	0.747
	IND7	0.757
	IND8	0.808
Management Support for Internal Audits (X3)	DUK1	0.812
	DUK2	0.866
	DUK3	0.864
	DUK4	0.837
	DUK5	0.852
Communication Between Auditors and Clients (X4)	KOMU1	0.791
	KOMU2	0.914
	KOMU3	0.908
	KOMU4	0.893
	KOMU5	0.829
	KOMU6	0.877
Application of Computer-Assisted Audit Techniques (Z)	TABK1	0.798
	TABK2	0.824
	TABK3	0.865
	TABK4	0.726
	TABK5	0.897
	TABK6	0.853
	TABK7	0.828
	TABK8	0.824

Panel B: Cross Loading Result

Indicator	Variable					
	1. Internal Audit Effectiveness	2. Internal Auditor Competence	3. Internal Auditor Independence	4. Management Support for Internal Audits	5. Communication Between Auditors and Clients	6. Application of Computer-Assisted Audit Techniques
EAI1	0.838	0.591	0.450	0.540	0.487	0.658
EAI2	0.736	0.538	0.360	0.503	0.420	0.495
EAI3	0.833	0.628	0.422	0.475	0.614	0.641
EAI4	0.816	0.584	0.429	0.453	0.563	0.589
EAI5	0.762	0.546	0.457	0.499	0.471	0.574
EAI6	0.828	0.566	0.470	0.564	0.555	0.615
EAI7	0.818	0.599	0.508	0.644	0.509	0.683
EAI8	0.773	0.596	0.448	0.472	0.549	0.619
EAI9	0.819	0.590	0.398	0.441	0.561	0.604
EAI10	0.860	0.616	0.399	0.463	0.548	0.595
EAI11	0.848	0.544	0.415	0.571	0.613	0.599
EAI12	0.760	0.492	0.413	0.597	0.537	0.496
EAI13	0.780	0.507	0.476	0.544	0.508	0.563
EAI14	0.806	0.513	0.395	0.562	0.452	0.596
EAI15	0.755	0.475	0.411	0.543	0.503	0.546
KOMP1	0.536	0.835	0.326	0.287	0.372	0.469
KOMP2	0.567	0.791	0.397	0.382	0.361	0.443
KOMP3	0.643	0.901	0.434	0.401	0.473	0.580
KOMP4	0.609	0.837	0.404	0.414	0.443	0.526
KOMP5	0.524	0.773	0.467	0.443	0.342	0.427
IND1	0.494	0.418	0.718	0.379	0.339	0.360
IND2	0.432	0.273	0.705	0.387	0.230	0.307
IND3	0.342	0.266	0.873	0.324	0.273	0.231
IND4	0.329	0.234	0.864	0.295	0.267	0.212
IND5	0.309	0.228	0.858	0.289	0.266	0.194
IND6	0.433	0.480	0.747	0.300	0.251	0.287
IND7	0.433	0.486	0.757	0.369	0.258	0.354
IND8	0.499	0.547	0.808	0.386	0.344	0.420
DUK1	0.593	0.444	0.395	0.812	0.505	0.425
DUK2	0.540	0.375	0.380	0.866	0.443	0.421
DUK3	0.544	0.387	0.415	0.864	0.441	0.479
DUK4	0.499	0.395	0.344	0.837	0.415	0.483
DUK5	0.577	0.365	0.335	0.852	0.433	0.504
KOMU1	0.471	0.343	0.309	0.366	0.791	0.405
KOMU2	0.614	0.474	0.278	0.463	0.914	0.470
KOMU3	0.660	0.478	0.287	0.518	0.908	0.502
KOMU4	0.607	0.461	0.357	0.451	0.893	0.448
KOMU5	0.488	0.378	0.384	0.461	0.829	0.362
KOMU6	0.554	0.367	0.286	0.499	0.877	0.340
TABK1	0.617	0.494	0.307	0.488	0.399	0.798
TABK2	0.585	0.455	0.353	0.368	0.329	0.824
TABK3	0.657	0.530	0.298	0.466	0.406	0.865
TABK4	0.575	0.422	0.309	0.418	0.408	0.726
TABK5	0.726	0.553	0.424	0.545	0.504	0.897
TABK6	0.565	0.480	0.310	0.395	0.396	0.853
TABK7	0.584	0.525	0.307	0.467	0.391	0.828
TABK8	0.561	0.459	0.277	0.450	0.380	0.824

Source: PLS Output, 2023 (processed)

Table 9 shows that most of the indicators in the research variables have outer loading values > 0.7. The data above shows that none of the variable indicators have an outer loading value below 0.5. Therefore, it can be stated that all indicators are valid and appropriate for use in the research and can be utilized for further analysis. The cross-loading values for each indicator are also included in Table 9, providing further validation of the indicators' reliability and relevance for the study. Each indicator in the research variables has the highest cross-loading value on the variable it forms compared to the cross-loading values on other variables. It can be concluded that the indicators used in this research have good discriminant validity in constructing their respective variables.

Discriminant validity was assessed through the Average Variance Extracted (AVE) values, while reliability was examined using Composite Reliability and Cronbach's Alpha. The results for these metrics are presented in Table 10, which consolidates the findings for all variables.

Table 10.
Average Variance Extracted, Composite Reliability, dan Cronbach's Alpha

Variable	Average Variance Extracted (AVE)	Composite Reliability	Cronbach's Alpha
Internal Audit Effectiveness	0.645	0.964	0.960
Internal Auditor Competence	0.687	0.916	0.885
Internal Auditor Independence	0.630	0.931	0.916
Management Support for Internal Audits	0.716	0.927	0.901
Communication Between Auditors and Clients	0.757	0.949	0.935
Application of CAATs	0.686	0.946	0.934

Source**:** PLS Output, 2023 (processed)

Table 10 illustrates that the AVE values for all constructs exceed the recommended threshold of 0.5, confirming adequate discriminant validity. Furthermore, the Composite Reliability and Cronbach's Alpha values for all variables surpass the minimum criterion of 0.7, demonstrating strong internal consistency and reliability. Specifically, the AVE values range from 0.630 to 0.757, indicating satisfactory convergent validity. The Composite Reliability values, ranging from 0.916 to 0.964, and Cronbach's Alpha values, ranging from 0.885 to 0.960, underscore the robustness of the measurement instruments. These results affirm that the indicators used are both valid and reliable for the constructs under study.

Inner Model Evaluation

The inner model evaluation assesses the influence of independent variables and moderating variables on the dependent variable in this research.

Coefficient of Determination (R-Squared)

R-Squared and Adjusted R-Squared values, which measure the proportion of variability in the dependent variable explained by the independent variables, were obtained through data analysis, as shown in Table 11.

Table 11.
R-Squared Result

Variable	R Squared	Adjusted R Squared
Internal Audit Effectiveness (EAI)	0,793	0,784

Source: PLS Output, 2023, processed

The R-Squared value indicates that all independent and moderating variables together influence the dependent variable (Internal Audit Effectiveness) by 0.793 (79.3%), while the Adjusted R-Squared value is 0.784 (78.4%). This shows a strong influence, as it exceeds the 75% threshold. Thus, the variables Competence, Independence, Management Support, Audit Communication, and the Application of Computer-Assisted Audit Techniques (CAATs)

explain 78.4% of the variability in Internal Audit Effectiveness, with the remaining 21.6% explained by other factors outside the research.

Predictive Relevance (Q-Squared)

The Predictive Relevance (Q-Squared) results show a value of 0.422, indicating that the model has substantial predictive relevance. Q-Squared is calculated using the formula (1 – SSE/SSO), where SSE stands for Sum of Squared Errors and SSO stands for Sum of Squared Observations.

Table 12.
Predictive Relevance (Q-Squared)

Variable	SSO	SSE	Q^2 (=1-SSE/SSO)
Internal Audit Effectiveness (EAI)	3120.000	1571.664	0.496
Internal Auditor Competence (KOMP)	1040.000	1040.000	
Internal Auditor Independence (IND)	1664.000	1664.000	
Management Support for Internal Audits (DUK)	1040.000	1040.000	
Communication Between Auditors and Clients (KOMU)	1248.000	1248.000	
Application of Computer-Assisted Audit Techniques (TABK)	1664.000	1664.000	
TABK*KOMP	208.000	208.000	
TABK*IND	208.000	208.000	
TABK*DUK	208.000	208.000	
TABK*KOMU	208.000	208.000	

Source: Output PLS, 2023 (processed).

As shown in Table 12, the Q-Squared value of 0.496 exceeds the 0.05 threshold, indicating that the model has good predictive relevance and that the independent and moderating variables used to predict the dependent variable are appropriate.

Goodness of Fit

The Goodness of Fit (GoF) value is derived from the Q-Squared value. Higher Q-Squared values indicate better model fit with the data. The computation results are as shown in Table 13.

Table 13.
AVE Results

Variable	Average Variance Extracted (AVE)	Average Communality
Internal Audit Effectiveness	0.645	0.686
Internal Auditor Competence	0.687	
Internal Auditor Independence	0.630	
Management Support for Internal Audits	0.716	
Communication Between Auditors and Clients	0.757	
Application of CAATs	0.686	

Source: PLS Output, 2023, processed

$$Goodness\ of\ Fit = \sqrt{average\ communality\ x\ R\ square}$$
$$= \sqrt{0{,}686\ x\ 0{,}793}$$
$$= 0{,}738$$

The GoF value of 0.738 categorizes the model fit as “large” indicating that both the measurement model (outer model) and structural model (inner model) are valid and well-suited for the data.

Effect Size (f-squared)

Effect Size (f-squared) evaluates the magnitude of influence between variables, categorized as follows: low (≥ 0.02), moderate (≥ 0.15), and high (≥ 0.35) (Sarstedt et al., 2021).

Table 14.
Effect Size (f-Squared)

Variable	Internal Audit Effectiveness (EAI)
Internal Audit Effectiveness (EAI)	
Internal Auditor Competence (KOMP)	0.036
Internal Auditor Independence (IND)	0.052
Management Support for Internal Audits (DUK)	0.083
Communication Between Auditors and Clients (KOMU)	0.114
Application of Computer-Assisted Audit Techniques (TABK)	0.156
TABK*KOMP	0.086
TABK*IND	0.000
TABK*DUK	0.004
TABK*KOMU	0.016

Source: PLS Output, 2023, processed

As shown in Table 14, the influence of CAATs on internal audit effectiveness is moderate (f-squared > 0.15), while its moderating influence with other variables is weak (f-squared < 0.02).

Model Fit

To meet model fit criteria, the following thresholds apply: Root Mean Squared Theta < 0.102, SRMR < 0.10 or < 0.08, and NFI > 0.9.

Table 15.
Model Fit Values

Metric	Value	Threshold	Fit
Root Mean Squared Theta	0.134	< 0.102	Not Fit
Standardized Root Mean Squared (SRMR)	0.071	< 0.10	Fit
NFI	0.69	> 0.9	Not Fit

Source: PLS Output, 2023, processed

Table 15 shows that while Root Mean Squared Theta and NFI did not meet the fit criteria, the SRMR value indicates that the model has an acceptable fit with the data.

Path coefficients

Path coefficients in the PLS SEM analysis indicate the direct effects, showing the significance and strength of the relationships between variables, as well as testing hypotheses. The path coefficient values range from -1 to +1, where values closer to +1 indicate stronger positive relationships, while values closer to -1 indicate stronger negative relationships (Sarstedt et al., 2021).

Table 16.
Path Coeffients

Variabel	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
Internal Auditor Competence (KOMP) -> Internal Audit Effectiveness (EAI)	0.128	0.114	0.058	2.210	0.028
Internal Auditor Independence (IND)	0.126	0.132	0.039	3.227	0.001

Variabel	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (|O/STDEV|)	P Values
-> Internal Audit Effectiveness (EAI)					
Management Support for Internal Audits (DUK) -> Internal Audit Effectiveness (EAI)	0.176	0.173	0.046	3.797	0.000
Communication Between Auditors and Clients (KOMU) -> Internal Audit Effectiveness (EAI)	0.197	0.200	0.064	3.086	0.002
Application of Computer-Assisted Audit Techniques (CAATs) -> Internal Audit Effectiveness (EAI)	0.261	0.262	0.053	4.916	0.000
TABK*KOMP -> Internal Audit Effectiveness (EAI)	-0.151	-0.134	0.060	2.541	0.011
TABK*IND -> Internal Audit Effectiveness (EAI)	-0.003	-0.008	0.056	0.057	0.954
TABK*DUK -> Internal Audit Effectiveness (EAI)	0.033	0.017	0.075	0.437	0.663
TABK*KOMU -> Internal Audit Effectiveness (EAI)	-0.065	-0.080	0.060	1.084	0.279

Source: PLS Output, 2023, processed

As shown in Table 16, the variable Internal Auditor Competence (X1) has a coefficient value of 0.128, indicating that for every one-unit increase in X1, the dependent variable (EAI) increases by 12.8%. Similarly, Auditor Independence (X2) has a coefficient of 0.126, Management Support (X3) has a coefficient of 0.176, and Audit Communication (X4) has a coefficient of 0.197. All show positive influences. The variable CAATs Application (Z) has the largest coefficient value of 0.261, reflecting a strong positive effect The moderating interactions, such as TABKKOMP, TABKIND, and TABKKOMU, show negative coefficients, though only TABKKOMP has a statistically significant influence on Internal Audit Effectiveness.

Hypothesis Testing

Hypothesis testing measures the significance of the independent and dependent relationships. The hypothesis is accepted if T-Statistics ≥ T-Table (1.96) or P-Value < 0.05. These findings are summarized in Table 17.

Table 17.
Hypothesis Testing Results

Hypothesis	Influence	T-Statistics	T-Table	P-Values	Conclusion
H1	Internal Auditor Competence (KOMP) -> Internal Audit Effectiveness (EAI)	2.210	1,96	0.028	Accepted
H2	Auditor Independence (IND) -> EAI	3.227	1,96	0.001	Accepted
H3	Management Support (DUK) -> EAI	3.797	1,96	0.000	Accepted
H4	Audit Communication (KOMU) -> EAI	3.086	1,96	0.002	Accepted
H5	TABK*KOMP -> EAI	2.541	1,96	0.011	Accepted
H6	TABK*IND -> EAI	0.057	1,96	0.954	Rejected
H7	TABK*DUK -> EAI	0.437	1,96	0.663	Rejected
H8	TABK*KOMU -> EAI	1.084	1,96	0.279	Rejected

Source: PLS Output, 2023, processed

Hypothesis testing shows important connections between various variables. Path coefficient test for Hypothesis 1 gives P-Value = 0.028 and T-Statistic = 2.210. Since the T-Statistic is larger than the T-Table value of 1.96 and the P-Value is less than 0.05, auditor competence strongly impacts internal audit effectiveness, thus supporting Hypothesis 1. Likewise, Hypothesis 2 has a P-Value of 0.001 and a T-Statistic of 3.227 supporting auditor independence positive effects on internal audit efficiency. These results validate Hypothesis 2.

In Hypothesis 3, managerial help has a very large impact on internal audit effectiveness, P-Value = 0.000 and T-Statistic = 3.797. These values are important and they support Hypothesis 3. Equally, Hypothesis 4 shows that communication contributes to internal audit efficiency (P-Value 0.002 and T-Statistic 3.086), and the hypothesis was accepted.

Hypothesis 5 considers the moderating impact of CAATs, and it has a P-Value of 0.011 and a T-Statistic of 2.541. Those findings suggest that CAATs significantly increase the association between auditor ability and internal audit effectiveness, thus confirming Hypothesis 5. But Hypotheses 6, 7 and 8 are insignificantly moderating CAAT effects on the interactions between independence, managerial support, and communication with internal audit effectiveness. In particular, Hypothesis 6 gives us P-Value 0.954 with T-Statistic 0.057, Hypothesis 7 gives us P-Value 0.663 with T-Statistic 0.437, and Hypothesis 8 gives us P-Value 0.279 with T-Statistic 1.084. These values are what result in rejecting these speculations.

DISCUSSION

The results show that internal auditor competence has a positive effect on internal audit effectiveness. This finding indicates that auditors at the Ministry of Finance's Inspectorate General are sufficiently competent to achieve internal audit goals, aligning with the grand theory and past research. This result supports prior studies, including Badara & Saidin (2014), which highlighted the significance of auditor competence in enhancing audit depth, accuracy, and relevance, ultimately producing valuable insights and recommendations for organizations. Similarly, Savitri & Indrawati (2019) emphasized the role of competence in improving audit quality by equipping auditors with the necessary skills to deliver effective outcomes.

Independence also plays an important role in internal audit effectiveness, ensuring the auditors are objective when performing the audit. This result aligns with agency theory and previous work, such as the findings of Sania et al. (2019), which underscore that independence allows auditors to provide unbiased and credible assessments, fostering stakeholder trust. Additionally, Asiedu & Deffor (2017) and Takie & Yiadom (2016) affirmed the importance of independence in mitigating conflicts of interest and enhancing the reliability of audit outputs.
Management support has a positive impact on internal audit effectiveness, emphasizing that audits depend on solid managerial support, consistent with institutional theory and earlier research. Alzeban & Gwilliam (2014) and Baharud-din et al. (2014) demonstrated that effective managerial involvement ensures access to necessary resources, improved cooperation, and prompt resolution of identified issues. Furthermore, the study by Praktiyasa & Widhiyani (2016) highlighted that managerial endorsement also facilitates the use of advanced tools and techniques, such as CAATs, which further enhance audit efficiency.

Moreover, communication has a very strong positive impact on internal audit effectiveness. Inspectorate General auditors are professional and responsive to audit clients, ensuring effective audit delivery, as evidenced by previous studies. Setyaningrum & Kuntadi (2019) pointed to clear and collaborative communication as critical in aligning audit objectives with organizational goals. Similarly, Laurencia (2015) and Endaya & Hanefah (2016) highlighted the role of effective communication in fostering mutual understanding and actionable feedback between auditors and audit clients.

Using CAATs as a moderating variable improves auditor competence and internal audit effectiveness. This finding aligns with Fauzi (2020), Atmaja (2016), Surya & Widhiyani (2016), and Praktiyasa & Widhiyani (2016). These findings underline the critical role of CAATs in strengthening the relationship between auditor competence and internal audit effectiveness. However, their limited impact on other variables, such as independence and management support, highlights the complexity of technology integration within organizational settings. One explanation for this discrepancy is the steep learning curve associated with CAATs, as emphasized by Adam (2023), which necessitates sustained training and support to ensure effective adoption. Additionally, Arisanti et al. (2019) identified concerns about objectivity and the potential for resistance to change when integrating technology into audit processes. Organizations must address these barriers by investing in continuous skill development to ensure that auditors can fully leverage technological tools without compromising their independence or alignment with managerial goals.

CAATs do not balance independence against internal audit effectiveness due to factors such as technological sophistication, human bias, and the dominance of standard audit procedures, as suggested by Adam (2023). CAATs have minimal influence on the association between managerial support and internal audit effectiveness, possibly because of misalignment with existing practices or resistance from management. Praktiyasa & Widhiyani (2016) also noted that while CAATs enhance technical analysis, they do not necessarily address interpersonal or cultural dynamics, which remain pivotal in fostering effective communication and collaboration.

Finally, CAATs do not temper the association between communication and internal audit effectiveness. This aligns with the findings of Surya & Widhiyani (2016), which highlighted the continued importance of interpersonal skills in maintaining auditor-client rapport. Moreover, the strong association between communication and internal audit effectiveness reinforces the importance of organizational culture and relational dynamics. While CAATs offer efficiency, they cannot replace the nuanced understanding and collaboration required between auditors and audit clients. Organizational leaders should foster an environment that values open communication while integrating technological tools to complement rather than undermine human interaction.

These findings align with earlier studies by Fauzi (2020) and Ayu et al. (2015), yet diverge in their implications for managerial support and independence. Unlike prior research suggesting seamless integration, this study reveals potential resistance and misalignment when introducing new technologies. Such challenges highlight the need for enhanced training, robust leadership, and cultural adaptation to effectively integrate CAATs into government audit practices. Future research should explore these dynamics further, including larger samples and additional variables, to deepen understanding.

CONCLUSION

This study investigates the effects of competence, independence, management support, and communication on internal audit effectiveness at the MOFIG, with CAATs as a moderating variable. The findings suggest that internal auditor competency, independence, management backing, and communication plays a key role in internal audit effectiveness. CAATs as a moderating variable plays an important role in the relationship between internal auditor competence and internal audit effectiveness, but not in the relationship between independence, managerial support, and communication with internal audit effectiveness.

The study provide some practical implications. It emphasises the need to strengthen internal auditor capability, auditor independence, consistency in management support, easier communication and better use of CAATs. Companies need to make sure internal auditors are competent and have good knowledge of how to take advantage of available audit technologies. Meanwhile, they need to make sure that the deployment of technology does not jeopardize auditor independence. Management assistance and CAATs must be managed together to produce the best audit results. Furthermore, communication is key, especially with newer audit technologies being introduced. The study acknowledges limitations such as measurement limits, respondent bias, data limitations, temporal context, organisational variation, unknown outsiders, and the size of the moderating variable which might not fully reflect the complexity of phenomena. The generalizability of the study is likewise impoverished since the sample was restricted to auditors in the Inspectorate General of the Ministry of Finance. Therefore, the results cannot be attributed to other government agencies in Indonesia.

These drawbacks should be corrected in future research using more nuanced controls for the independent variables, like soft competencies integrating into the auditor competence construct. Future research might also address other factors that influence audit quality (ethical alertness, professional distrust, auditor experience), and increase sample size for more representative findings that better reflect the populations of the organisations surveyed.

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