

THE INFLUENCE OF COMPETENCE AND TECHNOLOGY ON INTERNAL AUDIT EFFECTIVENESS WITH MANAGEMENT SUPPORT AS A MODERATING VARIABLE: AN EMPIRICAL STUDY AT BANK MANDIRI

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Abstract – *In the banking environment, the role of internal auditors is becoming increasingly important in driving the effectiveness of internal audits, especially in the digital era that demands the use of technology and adequate competence. This study aims to examine the effect of competence and technology on the effectiveness of internal audits, with management support as a moderating variable. The population in this study was internal auditors working at Bank Mandiri Area Kisamaun Tangerang and all its branches. The sample used was 35 respondents obtained through convenience sampling techniques, namely sample selection based on ease of access and availability of respondents. The data used is primary data collected through online questionnaires using Google Forms. The data analysis technique used in this study is multiple linear regression and hypothesis testing with the help of the IBM SPSS Statistics version 26 application. The results of the study indicate that competence does not have a significant effect on the effectiveness of internal audits. Conversely, technology has a significant effect on the effectiveness of internal audits. In addition, management support is unable to moderate the effect of competence on the effectiveness of internal audits but can moderate the effect of technology on the effectiveness of internal audits.*

Keywords: Competence, Technology, Internal Audit Effectiveness, Management Support.

I. INTRODUCTION

Amid the dynamics of globalization and the increasing complexity of the banking industry today, organizations are required to continuously adapt to rapid changes in the business environment. To survive and grow sustainably, the banking industry needs an internal control system that is not merely a formality but one that functions strategically in ensuring operational effectiveness and the implementation of good corporate governance. Internal audit serves as one of the key pillars in maintaining the effectiveness of internal controls and preventing various forms of irregularities.

In practice, internal audit is not only responsible for monitoring compliance with policies and regulations but also plays a role in assessing overall operational efficiency and effectiveness (Sirajuddin & Ravember, 2020). However, weak implementation of internal audits can create opportunities for fraud in the banking sector. An internal audit function that does not operate

optimally may increase the risk of fraud and financial losses and diminish stakeholder trust in the integrity of the organization (Padang, 2023).

One case that drew public attention was the embezzlement of Rp6.1 billion by a rogue employee of Bank Banten. The perpetrator exploited weaknesses in the supervision system, including access to the safe combination and manipulation of the internal system known as the Rekening Balancing System (RBS), to disguise fictitious transactions and avoid audit detection. This case not only reflects the weakness of the internal control system but also underscores the critical role of internal audit as a key pillar in preventing systemic fraud.

Global data released by the Association of Certified Fraud Examiners (ACFE) in 2024 reinforces this urgency. Of the 1,921 fraud cases identified across 138 countries, the banking and financial services sector ranked highest with 305 cases. The most common types of fraud included asset misappropriation (89%), corruption schemes (48%), and financial statement fraud (5%). These findings highlight that strengthening oversight systems, including internal audit, remains a critical challenge within the financial industry.

In this context, the effectiveness of internal audit has become a strategic necessity for banking institutions. The Institute of Internal Auditors (IIA) defines internal audit effectiveness as the extent to which the internal audit function is able to achieve its objectives in providing assurance, consulting, and value-added services through a systematic and disciplined approach. This effectiveness is highly dependent on several critical factors, including competency, technology, and management support.

Auditor competence refers to a combination of knowledge, technical skills, and professional attitude required to conduct audits effectively. Competent auditors are able to accurately identify risks and provide constructive recommendations to management (Prihastuti et al., 2025). On the other hand, technology plays a critical role in enhancing the speed and accuracy of audit execution. The use of information systems and digital tools enables auditors to perform deeper data analysis and detect irregularities more efficiently (Rufaedah, 2022). Meanwhile, management support, such as the provision of adequate resources, commitment to audit outcomes, and the establishment of a work environment that embraces improvement, is also a crucial element in ensuring the success of internal audit implementation (Hamdi & Sari, 2019).

This study offers a novel contribution by examining the influence of competence and technology on internal audit effectiveness, while incorporating management support as a moderating variable within a single analytical model. By focusing on a specific operational region within the banking sector, this research provides a contextual perspective that differs from most prior studies, thereby enriching the literature in this field.

In line with the aforementioned background and phenomena, the research problems addressed in this study are as follows: (1) Does competence affect internal audit effectiveness? (2) Does technology affect internal audit effectiveness? (3) Does management support moderate the relationship between competence and internal audit effectiveness? (4) Does management support moderate the relationship between technology and internal audit effectiveness? The objective of this study is to examine and analyze the influence of auditor competence and technology on internal audit effectiveness and to investigate the moderating role of management support in these relationships.

The purpose of this study is to explore and analyze the influence of competence and technology on the effectiveness of internal audit, as well as to explore and analyze the moderating role of management support in the relationship between competence and technology and the effectiveness of internal audit.

This study offers theoretical contributions to the literature on internal auditing and provides practical insights for Bank Mandiri's management and internal auditors in enhancing audit effectiveness through improved competence, appropriate technological adoption, and robust managerial support.

II. LITERATURE REVIEW

Theoretical review

Agency theory, as proposed by Jensen and Meckling (1976), explains the contractual relationship between the owner (principal) and the manager (agent), in which the manager is authorized to manage the company on behalf of the owner. However, due to information asymmetry, managers may act in their self-interest. In this context, internal auditors serve as independent parties who bridge the potential conflicts between principals and agents and ensure that the information provided by management is reliable and accountable.

Referring to this theory, auditor competence becomes crucial in providing objective and accurate assessments of management performance. The use of technology also enhances the audit process by enabling auditors to detect irregularities more quickly and efficiently. Meanwhile, management support is necessary for auditors to perform their duties optimally in an environment that promotes transparency. Thus, agency theory serves as the conceptual foundation that explains the importance of competence, technology, and management support in improving the effectiveness of internal audits.

Internal Audit Effectiveness

The effectiveness of internal audit measures the extent to which audit objectives are optimally achieved. According to Setiowati et al. (2023), effectiveness reflects the success of an activity in reaching its goals, regardless of the amount of resources utilized. An effective internal audit enhances operational efficiency and strengthens the organization's internal control system (Jamaludin, 2021), thus playing a key role in supporting robust organizational governance.

Competence

Auditor competence is a crucial element in ensuring audit quality. Auditors with adequate knowledge, skills, and experience are capable of providing objective assessments and appropriate recommendations (Dwiyanto & Rufaedah, 2020). Strong competence enables auditors to thoroughly understand the audit process and enhances the effectiveness of internal audits (Eviyanti et al., 2023).

Technology

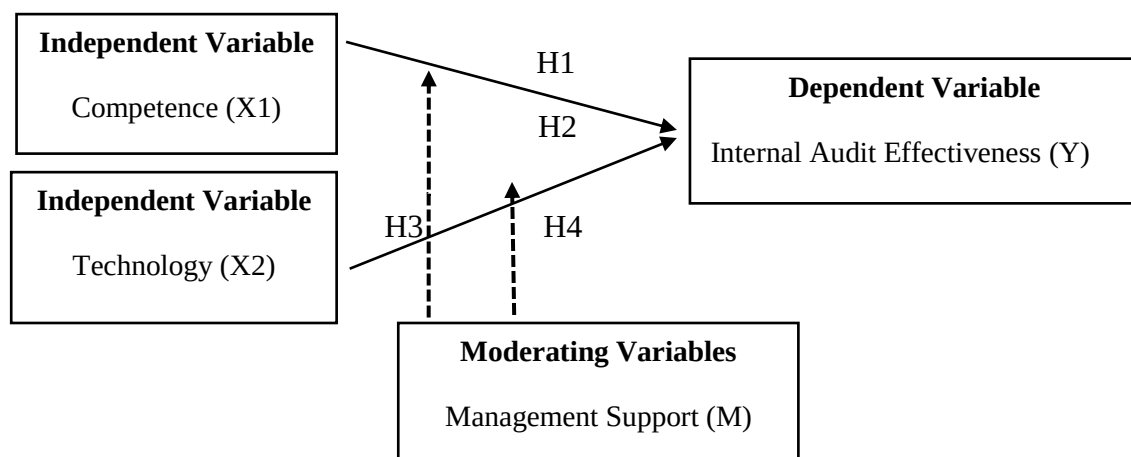
Information technology accelerates and refines the audit process by automating data collection and analysis. As stated by Farah Ashma Nadiyah et al. (2024), the use of IT in auditing improves the accuracy of results and reduces human error. Moreover, with the capability to detect patterns and anomalies, IT becomes an essential tool for auditors in supporting effective audits in the digital era (Okinaldi & Aziza, 2024).

Management Support

Strong management support is a key determinant of internal audit effectiveness. Management's commitment to providing adequate resources, access to information, and follow-up on audit recommendations enhances organizational accountability (Bakri & Mahfiza, 2024). A supportive work environment further strengthens auditors' confidence and fosters high-quality audits (Febrianti et al., 2021).

Framework

To clarify the direction and focus of the research, the relationship between variables is illustrated through a conceptual framework in the form of the following visual scheme:



Research Hypothesis

The Influence of Competence on the Effectiveness of Internal Audit

Auditors play a pivotal role in safeguarding the integrity of financial reporting through their technical expertise, analytical capabilities, and comprehensive understanding of accounting standards. Auditor competence enhances the ability to accurately identify risks and provide value-added recommendations that contribute to the achievement of organizational objectives. As noted by Suci et al. (2023), higher levels of auditor competence are positively associated with greater value creation by internal audit functions. Previous studies such as Suci et al. (2023), Ishak & Nuramal (2023), and Setiowati et al. (2023) consistently demonstrates that auditor competence exerts a significant positive influence on the effectiveness of internal audit. In line with these findings, the following hypothesis is proposed:

H1: Auditor competence has a positive effect on internal audit effectiveness.

The Influence of Technology on the Effectiveness of Internal Audits

Technology plays an important role in improving the effectiveness of internal audits by enabling auditors to analyze data accurately and efficiently. In addition to supporting decision-making processes, technology also demands that auditors possess technical skills and an understanding of information security risks (Muhammad Fauzi Ilmi et al., 2024). Previous research by Jurnal Ekonomi et al. (2021), Bani Ahmad (Ayassrah) et al. (2023), and Kusumawardhani & Muanas (2020) indicates that the use of information technology

positively influences internal audit effectiveness. Based on the discussion above, the following hypothesis is proposed:

H2: Information technology has a positive effect on internal audit effectiveness.

Management Support Moderates the Influence of Competence on Internal Audit Effectiveness

Auditor competence reflects the professional capability to perform audit tasks effectively. However, without management support in the form of training, budgeting, and work facilities, such competence may be difficult to fully optimize. Management support reinforces the influence of auditor competence on internal audit effectiveness by enabling auditors to work more optimally and deliver more accurate and value-added audit results for the organization. A study conducted by Rakhmat and Fadhilah (2019) found that senior management support acts as a pure moderator in the relationship between internal auditor competence and internal audit effectiveness. Based on the discussion above, the following hypothesis is proposed:

H3: Management support moderates the influence of auditor competence on internal audit effectiveness.

Management Support Moderates the Influence of Technology on Internal Audit Effectiveness

Information technology enables the audit process to be more efficient and accurate, particularly in data collection, analysis, and reporting. However, its effectiveness heavily depends on management support, such as budget allocation, training, and infrastructure provision. With such support, auditors can optimize the use of technology to accurately detect risks and enhance the effectiveness of internal audits. This research aligns with the study conducted by Doda et al. (2025), which shows that top management support moderates the relationship between the use of information technology and the effectiveness of internal audits. Based on this explanation, the proposed hypothesis is as follows:

H4: Management support moderates the influence of information technology on the effectiveness of internal audits.

III. METHODS

Type of Research

This study employs a quantitative approach using a survey method. This approach is chosen because it enables the presentation of data in numerical form, which can be statistically analyzed to examine relationships and effects among variables. Sugiyono (2019) states that the quantitative approach applies statistical analysis techniques to test hypotheses on a specific population or sample.

Population and Sample

The population is defined as the generalization area consisting of objects or subjects that possess specific characteristics determined by the researcher (Sugiyono, 2019:127). The population in this study comprises all internal auditors working at Bank Mandiri in the Tangerang Ki Samaun Area. The sample consists of 35 respondents who are part of the population and meet the research criteria (Sugiyono, 2019:127). The sampling technique used

is convenience sampling, which is based on ease of access and respondent willingness, considering time and resource efficiency.

Data Collection Method

This study utilizes primary data collected through the online distribution of questionnaires via Google Forms, targeting respondents who met the established criteria. The questionnaire was developed based on the indicators of each research variable and employed a five-point Likert scale, ranging from “Strongly Disagree” to “Strongly Agree,” to assess respondents’ perceptions of each indicator. The selection of this method was driven by its practicality in distribution, time efficiency, and the ease it provides for respondents to access and complete the survey.

Operational Variables

The operationalization of variables in this study is explained through operational definitions, indicators of each variable, and the measurement scale used. Each variable is measured using a five-point Likert scale. Detailed information is presented in the following table.

Table 1 Variable Indicator

Variable	Indicator	Scale
Competence (Yuliarti & Istiningrum, 2023)	a) Formal education b) Auditor Training c) Auditor Experience d) Professional Education	Likert
Technology (Purba et al., 2021)	a) Computer hardware b) Computer software c) Networks and Communications d) Database	Likert
Internal Audit Effectiveness (Safriaddin et al., 2020)	a) The appropriateness and significance of the audit findings and their recommendations. b) Response from the object being inspected. c) Feedback from management. d) Achievement of the inspection program.	Likert
Management Support (Digital et al., 2022)	a) Management commitment to strengthening internal control. b) Budget allocation provided in internal control activities. c) The composition between the number of audit activities and auditors provided by management.	Likert

Data Analysis Techniques

The data analysis techniques in this study include validity and reliability tests to ensure the adequacy of the instruments, followed by classical assumption tests covering normality, multicollinearity, and heteroscedasticity. Data analysis is conducted using multiple linear

regression with a moderation approach to examine the influence of competence and technology on internal audit effectiveness, with management support as the moderating variable. Hypothesis testing is carried out through t-tests, F-tests, and the coefficient of determination (R^2). All data analyses in this study were performed using SPSS version 26.

IV. RESULTS AND DISCUSSION

This section presents the results of data processing and analysis obtained from the questionnaire, including the results of validity tests, reliability, multiple linear regression, and hypothesis testing. Furthermore, the discussion is structured based on empirical findings related to theory and previous research results.

Results of Descriptive Statistical Tests

Based on the SPSS output, descriptive statistical tests were conducted to see the general overview of each research variable. The results are shown in Table 2 as follows:

Table 2 Descriptive Statistical Test Results

Variable	N	Minimum	Maximum	Mean	Std. Dev
Competence	35	48	60	53,57	3,920
Technology	35	48	60	52,54	4,189
Internal Audit Effectiveness	35	48	60	52,09	4,189
Management Support	35	24	60	26,06	1,571
Valid N (listwise)	35				

In Table 2, the results of the descriptive statistical test show that the variables of competence, technology, and internal audit effectiveness have averages above 52, with a standard deviation of around 4. Meanwhile, management support has an average of 26.06 and a standard deviation of 1.571. This indicates that the respondents' assessments are quite high and relatively consistent regarding those variables.

Results of Validity and Reliability Tests

Based on the SPSS output, the validity test is used to assess the accuracy of the instrument, while the reliability test is used to measure its consistency. The test results are shown in the following Table 3:

Table 3 Validity and Reliability Test Results

Variable	Item	Pearson Correlation	Cronbach Alpha	Kesimpulan
Competence	12	0,606–0,713	0,883	Valid and Reliable
Technology	12	0,612–0,781	0,913	Valid and Reliable
Internal Audit Effectiveness	12	0,633–0,783	0,913	Valid and Reliable
Management Support	6	0,419–0,648	0,543	Valid and Reliable

In Table 3, the results of the validity test are shown through the Pearson Correlation value, where all instrument items have a calculated r value greater than the table r value (0.3338), thus all statements in the questionnaire are declared valid. This means that the questionnaire used is capable of accurately measuring the research variables and is suitable for use as a data collection tool. Meanwhile, the reliability test is indicated by the Cronbach's Alpha value, all of which are above 0.60, indicating that the instruments are reliable. The Competence variable (0.883) falls under high reliability, Technology and Internal Audit Effectiveness (0.913) show very high reliability, and Management Support (0.543), although categorized as moderate, still meets the criteria for use in the research.

Results of the Classical Assumption Test

This research has met the classical assumption tests, namely normality, multicollinearity, and heteroscedasticity. The data is normally distributed because the residuals form a bell curve. There is no multicollinearity because the Tolerance value > 0.10 and VIF < 10 , namely Competence (0.371; 2.698), Technology (0.547; 1.828), and Management Support (0.506; 1.974). The heteroscedasticity test also shows the scatterplot points are randomly distributed without a pattern, indicating it is free from heteroscedasticity symptoms.

Results of Multiple Regression Analysis

Based on the SPSS output, multiple regression is used to test the effect of independent variables on the dependent variable. The results of the analysis are presented in the following Figure 1:

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10,084	7,457		1,352	,186
	Kompetensi	,281	,178	,263	1,581	,124
	Teknologi	,513	,167	,513	3,078	,004

a. Dependent Variable: Efektivitas Audit Internal

Figure 1 Multiple Linear Regression Analysis Test Results

Based on Figure 1, the following regression equation was obtained:

$$Y = 10,084 + 0,281X_1 + 0,513X_2.$$

Based on the regression equation above, it can be explained as follows:

- 1) The constant of 10.084 indicates the presence of other factors beyond the variables of competence and technology that influence the effectiveness of internal audits.
- 2) Competence coefficient (X_1) = 0,281, meaning competence has a positive but not significant effect (significance 0,124 > 0,05).
- 3) Technology coefficient (X_2) = 0,513, indicating a positive and significant effect on internal audit effectiveness (significance 0,004 < 0,05).

Results of the Determination Coefficient Test

Based on the SPSS output, the coefficient of determination test was conducted to see the extent of the influence of the independent variable on the dependent variable. The test results are shown in the following Figure 2:

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,765 ^a	,585	,513	2,922

a. Predictors: (Constant), Teknologi*Dukungan Manajemen, Kompetensi, Dukungan Manajemen, Teknologi, Kompetensi*Dukungan Manajemen

Figure 2 Results of Determination Coefficient Test

Based on Figure 2, the Adjusted R Square value of 0,513 indicates that competence, technology, and management support can explain 51,3% of the variation in internal audit effectiveness, while the remaining 48,7% is influenced by factors outside the research model.

Results of the t-test

Based on the SPSS output, the t-test was conducted to determine the partial effect of each independent variable on the dependent variable. The test results are shown in the following Figure 3:

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1	(Constant)	100,370	125,422		,800
	Kompetensi	3,000	2,334	2,807	1,285
	Teknologi	-4,188	2,185	-4,188	-1,917
	Dukungan Manajemen	-3,191	4,941	-1,197	-,646
	Kompetensi*Dukungan Manajemen	-,103	,090	-4,260	-1,148
	Teknologi*Dukungan Manajemen	,174	,081	6,958	2,153

a. Dependent Variable: Efektivitas Audit Internal

Figure 3 t Test Results

Based on Figure 3, the following regression equation was obtained:

$$Y = 100,370 + 3,000 X_1 - 4,188 X_2 - 0,103(X_1 \times M) + 0,174(X_2 \times M) + \varepsilon$$

- 1) The constant value of 100,370 indicates the effectiveness of internal audit when all variables are held constant.
- 2) The interaction $X_1 \times M$ (competence $\times$ management support) is not significant (sig. 0,260 > 0,05), meaning that management support does not moderate the effect of competence.
- 3) The interaction $X_2 \times M$ (technology $\times$ management support) is significant (sig. 0,040 < 0,05), meaning that management support moderates the influence of technology on internal audit effectiveness.

Result of the f-test

Based on the SPSS output, the F-test was conducted to determine the simultaneous effect of the independent variables on the dependent variable. The results are shown in the following Figure 4:

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	349,107	5	69,821	8,177	,000 ^b
	Residual	247,636	29	8,539		
	Total	596,743	34			

a. Dependent Variable: Efektivitas Audit Internal

b. Predictors: (Constant), Teknologi*Dukungan Manajemen, Kompetensi, Dukungan Manajemen, Teknologi, Kompetensi*Dukungan Manajemen

Figure 4 Test Results f

Based on the F Test results in Figure 4, a significance value of $0.000 < 0.05$ and a calculated F value of 8.177 were obtained. This indicates that the regression model involving the variables of competence, technology, management support, and their moderation interaction simultaneously has a significant impact on the effectiveness of internal audits. Thus, it can be concluded that the model is suitable for use in this research.

The result is:

The Influence of Competence on the Effectiveness of Internal Audit

Based on the t-test, the competence variable recorded a significance value of 0.124 (> 0.05), indicating competence has no significant effect on internal audit effectiveness; therefore, hypothesis H1 was rejected. This finding aligns with Ta and Doan (2022), who reported that competence has not enhanced audit effectiveness because it remains largely administrative in nature and plays a limited role in decision-making. However, it contrasts with the results of Ishak and Nurama (2023), Grima et al. (2023), and Rakhmat and Fadhillah (2019), who found a positive effect. From an agency theory perspective, competence should serve as a primary instrument for minimizing information asymmetry. Nevertheless, when competence is not optimally implemented such as due to limited practice-based training, assignments misaligned with expertise, or managerial dominance that constrains auditor independence the monitoring function weakens. Under such conditions, auditors become confined to administrative roles, thereby limiting their contribution to internal audit effectiveness.

The Influence of Technology on the Effectiveness of Internal Audits

In contrast to competence, the t-test results for the technology variable indicate a significant effect on internal audit effectiveness, with a significance value of 0.004 (< 0.05), thus supporting the acceptance of H2. This result is consistent with Doda et al. (2025), who assert that the use of technology enhances audit processes by improving accuracy and efficiency, although Lonto and Pandowo (2023) and Azizah and Farid (2021) note that the effectiveness of technology remains contingent on the auditor's capabilities. Within the framework of agency theory, technology functions as a monitoring tool that strengthens transparency, accelerates real-time data access, and reduces human error. In other words, technology narrows the scope for moral hazard by providing principals with more accurate information. However, only practical training and adequate infrastructure can fully realize this positive impact.

Management Support Moderates the Influence of Competence on Internal Audit Effectiveness

The moderation of management support in the relationship between competence and internal audit effectiveness recorded a significance value of 0.260 (> 0.05) in the t-test results, leading to the rejection of H3. This finding aligns with Novranggi et al. (2019), who argue that management support limited to administrative policies is insufficient to optimize the use of auditors' competencies, and contrasts with Sirajuddin and Merlin (2019), who emphasize the importance of tangible support such as facilities and direct attention. From an agency theory perspective, symbolic support is inadequate to strengthen the auditor's monitoring function, resulting in competencies that do not contribute significantly. Active management involvement is essential, including the provision of authority, facilities, and incentives designed to maximize the utilization of auditor competencies in controlling agent behavior so that it aligns with the principal's interests.

Management Support Moderates the Influence of Technology on Internal Audit Effectiveness

For hypothesis H4, the analysis of the relationship between technology and internal audit effectiveness shows that management support has a significant effect. This indicates that management support can strengthen the utilization of technology to enhance internal audit effectiveness. The significance value of 0.040 (< 0.05) supports the acceptance of H4. This finding is consistent with Doda et al. (2025), who assert that tangible management support such as the provision of facilities and training can optimize the use of technology in auditing. From an agency theory perspective, management is regarded as having the capacity to provide resources and create a conducive environment for auditors. Such active support increases the likelihood that technology will function as an effective monitoring instrument, as auditors are equipped with the tools and authority needed to carry out control functions in alignment with the principal's objectives.

V. CONCLUSION

This research examines and analyzes the influence of competence and technology on the effectiveness of internal audits with management support as a moderating variable. The research results show that:

- 1) Competence does not have a significant effect on the effectiveness of internal audits (sig. 0,124);
- 2) Technology has a positive and significant impact (sig. 0,004);
- 3) Management support does not moderate the relationship between competence and audit effectiveness (sig. 0,260);
- 4) Management support significantly moderates the influence of technology on internal audit effectiveness (sig. 0,040).

This study has several limitations, including that the independent variables can only explain 51.3% of the variation in internal audit effectiveness, while the remaining variation is influenced by other factors that have not yet been studied. In addition, the data collection process was hindered by the respondents' busy work schedules, resulting in only 35 samples, which limits the generalization of the findings. Therefore, it is recommended that future research include additional variables, such as internal control, organizational culture, independence, and auditor experience, as well as expand the number of respondents and the data collection period to obtain more comprehensive results. Practically, the management of Bank Mandiri is expected to evaluate the strategy for developing the competencies of internal auditors through tangible support, such as practice-based training, assignments according to expertise, and an evaluation system focused on audit results.

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