JOURNAL OF MANAGEMENT AND BUSINESS SOLUTIONS

The Role of Internal Audit Competencies in Moderating the Relationship Between Risk Disclosure and Firm Value

1. Zohreh. Yousefirad : Department of Accounting, Ki.C., Islamic Azad University, Kish, Iran
2. Zohreh. Hajiha *: Department of Accounting, ST.C., Islamic Azad University, Tehran, Iran
3. Mohsen. Amini Khouzani: Department of Financial Management, ShQ.C., Islamic Azad University, Shahr-e Qods, Iran
4. Mahdi. Salehi: Department of Accounting, Faculty of Economics and Administrative Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

*corresponding author's email: Drzhajiha@iau.ac.ir

ABSTRACT

This study aims to examine the impact of transparency in risk disclosure on market behavior and investors' decisions in companies listed on the Tehran Stock Exchange. The present research is applied in nature and follows a descriptive-analytical methodology. The statistical population consists of companies listed on the Tehran Stock Exchange in 2023 (1402), from which 94 companies were selected as the sample. For data collection, a questionnaire was used in the qualitative section, while secondary financial data from listed companies were employed in the quantitative section. To analyze the data, descriptive and inferential statistical methods—including factor analysis and structural equation modeling—were applied. The findings of this research indicate that accurate and transparent risk disclosure reduces information asymmetry, increases investor confidence, and improves their decision-making processes. Furthermore, the competencies of internal auditors and the manner in which risk information is presented in financial reports have significant effects on market behavior and investor reactions. The study suggests that enhancing transparency in risk disclosure and strengthening the role of internal auditors can contribute to greater stability in financial markets and increased public trust in them.

Keywords: Risk Disclosure, Firm Value, Internal Audit Competence.

Introduction

In contemporary capital markets, risk disclosure has evolved from a peripheral reporting practice into a central mechanism through which firms communicate uncertainty, credibility, and strategic awareness to investors and other stakeholders. Increasing globalization, regulatory pressure, climate-related uncertainty, technological disruption, and heightened scrutiny of corporate governance structures have collectively intensified demands for transparent, decision-useful risk information. Consequently, the disclosure of financial, operational, strategic, and non-financial risks is no longer viewed merely as a compliance exercise, but rather as a fundamental component of value-relevant corporate communication that shapes investor expectations, market behavior, and firm valuation (1-3).

Article history:
Received 28 August 2025
Revised 22 November 2025
Accepted 29 November 2025
First Published 29 December 2025
Published online 01 January 2026

How to cite this article:
Yousefirad, Z., Hajiha, Z., Amini Khouzani, M., & Salehi, M. (2026). The Role of Internal Audit Competencies in Moderating the Relationship Between Risk Disclosure and Firm Value. *Journal of Management and Business Solutions, 4*(1), 1-17. https://doi.org/10.61838/jmbs.110

Prior research consistently indicates that information asymmetry lies at the heart of capital market inefficiencies, and that high-quality disclosure functions as a signaling mechanism that mitigates uncertainty and reduces the cost of capital. Within this framework, risk disclosure occupies a particularly sensitive position, as it conveys both potential downside exposure and managerial competence in anticipating, managing, and governing uncertainty. Empirical evidence demonstrates that firms engaging in more extensive and precise risk disclosure tend to experience enhanced investor confidence and improved market outcomes, although the magnitude and direction of these effects vary across institutional environments and governance structures (4-6).

The growing complexity of business environments has also expanded the scope of risk disclosure beyond traditional financial risks. Climate change exposure, sustainability-related risks, cyber risks, and strategic vulnerabilities have become salient determinants of firm performance and valuation. Recent studies emphasize that markets increasingly incorporate such non-financial risk signals into pricing decisions, particularly in jurisdictions where regulatory frameworks mandate enhanced transparency (7-9). This shift underscores the necessity of examining risk disclosure as a multidimensional construct embedded within broader governance and control systems.

Corporate governance literature highlights that the effectiveness of risk disclosure is contingent not only on the quantity of information released, but also on the institutional mechanisms that shape its credibility and interpretability. Audit committees, boards of directors, and external auditors have been extensively examined as governance actors influencing disclosure practices and reporting quality (10-12). Nevertheless, while these mechanisms play a crucial oversight role, they operate alongside internal control functions that directly influence how risks are identified, assessed, and communicated.

Among these internal mechanisms, internal auditing has emerged as a pivotal yet underexplored determinant of risk disclosure effectiveness. Internal auditors operate at the intersection of governance, risk management, and control, providing assurance on the adequacy of risk processes and the reliability of reported information. Prior evidence suggests that strong internal audit functions enhance monitoring quality, reduce opportunistic reporting behavior, and improve overall disclosure credibility (13-15). However, the literature remains fragmented regarding how the **competence** of internal auditors shapes the market consequences of risk disclosure.

Internal audit competence is a multidimensional construct encompassing professional expertise, analytical skills, environmental awareness, managerial capability, and personal attributes. Studies grounded in agency theory and resource-based perspectives argue that competent internal auditors act as strategic resources that strengthen governance systems and enhance information reliability (16-18). Yet, despite growing acknowledgment of their role, empirical research has primarily examined internal audit effectiveness in isolation, rather than as a moderator that conditions how markets interpret disclosed risk information.

Recent developments in auditing practices further accentuate the importance of internal audit competence. The integration of digital technologies, artificial intelligence, and data analytics into audit processes has transformed internal auditing from a compliance-oriented function into a forward-looking, value-adding activity. Evidence suggests that technologically adept and professionally skeptical internal auditors are better positioned to evaluate complex risk profiles and ensure balanced disclosure (19-21). These advancements raise critical questions regarding whether markets respond differently to risk disclosures issued by firms with stronger internal audit capabilities.

The relationship between risk disclosure and firm value remains theoretically ambiguous. From a signaling theory perspective, transparent risk disclosure conveys managerial confidence and reduces uncertainty, thereby enhancing firm value. Conversely, excessive or poorly contextualized disclosure may amplify perceived risk and trigger adverse market reactions. Empirical findings reflect this duality, with studies documenting both positive and negative valuation effects depending on disclosure quality, governance context, and market sophistication (1, 22, 23). This ambiguity suggests that intermediary mechanisms—such as internal audit competence—may play a decisive role in shaping outcomes.

Climate-related and sustainability risks further complicate this relationship. Evidence from emerging markets indicates that climate risk disclosure can simultaneously improve transparency while exposing firms to heightened scrutiny, making the credibility of disclosure processes particularly salient (7, 8). In such contexts, internal auditors with strong professional and environmental competencies may enhance the informational value of disclosures by ensuring consistency, accuracy, and strategic coherence.

Similarly, research on audit committees and governance reforms highlights that oversight structures alone are insufficient to guarantee high-quality risk disclosure. Instead, the effectiveness of these structures depends on complementary internal capabilities that translate governance intent into reliable reporting outcomes (5, 14, 24). Internal audit competence thus emerges as a critical but underexamined link between governance architecture and market valuation.

Theoretical insights from agency theory further support this argument. Information asymmetry between managers and investors creates incentives for selective disclosure and earnings management, particularly in high-risk environments. Competent internal auditors can mitigate these agency problems by strengthening internal controls, enhancing monitoring, and ensuring that disclosed risk information reflects economic reality rather than managerial bias (6, 25, 26). This monitoring role is especially relevant in emerging markets characterized by weaker investor protection and higher informational opacity.

Despite the growing body of literature on risk disclosure, corporate governance, and auditing, several gaps remain evident. First, most empirical studies examine the direct relationship between governance mechanisms and risk disclosure, without considering how internal audit competence conditions market responses to disclosed risks (27, 28). Second, existing research often treats internal audit quality as a binary or aggregate construct, neglecting its multidimensional nature and differential effects (12, 13). Third, limited attention has been paid to emerging and transitional economies, where institutional constraints heighten the importance of internal control mechanisms in shaping disclosure credibility (29, 30).

Furthermore, the increasing emphasis on sustainability assurance and non-financial reporting quality underscores the need to integrate internal audit competence into analyses of firm value. Studies show that assurance quality and internal governance structures significantly influence how stakeholders interpret risk-related disclosures, particularly in the context of environmental and social risks (22, 31). Yet, the moderating role of internal audit competence in this process remains largely unexplored.

Addressing these gaps is particularly relevant for markets undergoing rapid regulatory, technological, and economic transformation. In such environments, firms face heightened exposure to financial volatility, political risk, and operational uncertainty, making credible risk disclosure essential for sustaining investor trust. Internal auditors, as custodians of internal control integrity, are uniquely positioned to influence how risk information is generated, validated, and communicated (24, 32).

In light of these considerations, a more nuanced understanding of the interplay between risk disclosure, internal audit competence, and firm value is warranted. Examining this relationship contributes not only to disclosure and auditing literature, but also to broader debates on governance effectiveness, market efficiency, and value creation in complex institutional settings (2, 3, 9).

Accordingly, this study aims to examine the effect of risk disclosure on firm value and to investigate whether internal audit competence moderates this relationship.

Methods and Materials

In the present study, a mixed-method approach was employed, utilizing both qualitative and quantitative methods. This approach was adopted to benefit simultaneously from the analytical depth of qualitative research and the precision and generalizability of quantitative research. In this framework, data were collected and analyzed in parallel and with equal weight, allowing for the examination of overlap, convergence, or divergence between the results of the two approaches.

The statistical population in the quantitative section consists of companies listed on the Tehran Stock Exchange, while the qualitative population includes all studies, articles, and scientific sources related to the topic, as well as experts, specialists, faculty members, auditors, and individuals involved in the field of internal auditing. Sampling in the quantitative section was conducted purposefully through screening the statistical population. Financial and monetary service companies, non-manufacturing firms, and companies that had changes in fiscal year or operational activities were excluded. Ultimately, 94 companies were selected as the final sample. In the qualitative section, purposeful sampling of articles was carried out, and the exact sample size was determined during the research process.

For data collection, a questionnaire was used in the qualitative section, and secondary financial data from companies listed on the Tehran Stock Exchange were used in the quantitative section. The financial data were obtained from company reports for the year 2023 (1402).

For qualitative data analysis, MAXQDA version 18 was used, which is a powerful tool for analyzing textual and qualitative data and assists in organizing and visualizing the data. In the quantitative data analysis section, SmartPLS software was used for structural equation modeling (PLS method). This software enables researchers to accurately analyze and simulate relationships between latent and observed variables.

The conceptual framework illustrated in Figure 1 demonstrates that the technical and professional competencies of internal auditors enhance monitoring efficiency and improve the quality of financial, operational, and strategic risk disclosures within firms (Tao and Down, 2022; Mounia et al., 2022; Desi et al., 2011).

Moreover, internal auditors' competencies play a significant moderating role in the relationship between financial risk disclosure and abnormal stock returns (Liu et al., 2021). According to Appiah et al. (2022), internal audit competencies influence the management of information dissemination and the quality of reporting, thereby directly affecting abnormal stock returns. Consequently.

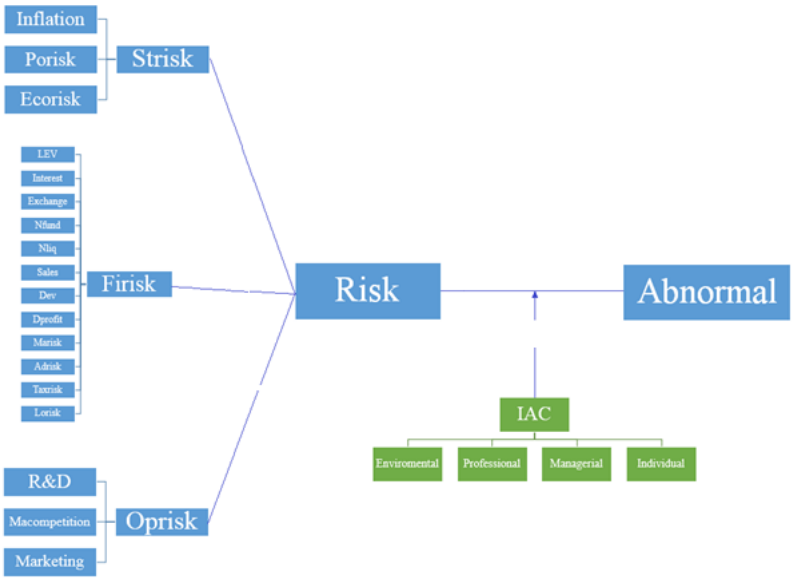

Figure 1. The conceptual framework

Operational definition of variables

Abnormal stock return

The dependent variable in this study is the absolute change in cumulative abnormal stock return (CAR), calculated using the methods proposed by Hamidian, Arabsalehi and Amiri (2020). The direction of the return is not considered; instead, the absolute value of the abnormal return is measured over a three-day event window that includes the day of the board report announcement, as well as one day before and one day after the announcement, following McDonald (2011).

In addition, a *seven-day event window* (three days before and three days after the disclosure) is used as a robustness test, and its results are compared with those of the three-day window. The market index on day *t* and the preceding day (t–1) is also incorporated into the calculation.

Independent variables

Risk disclosure

The independent variable, risk disclosure, is measured as the natural logarithm of the frequency of risk-related terms appearing in corporate reports. This approach follows the methodology of Li et al. (2019) and has been adapted to the Iranian reporting environment (Tabatabaei et al., 2021). Based on the contextual characteristics of Iranian firms, risk disclosure is categorized into two main types: financial risk and non-financial risk.

- Financial Risk refers to risks that directly affect the firm's financial statements and cash flows (e.g., interest rate, exchange rate, and debt-related risks).
- Non-Financial Risk includes operational risks (e.g., daily decisions, production, marketing) and strategic risks (e.g., inflation, recession, sanctions, regulatory changes).
- Each category is quantified using the natural logarithm of the frequency of relevant risk-related terms in corporate reports.
- Additionally, the following definitions are applied to specific types of risk indicators:
- Financial Leverage: The ratio of the change in profit before tax to the change in operating income.

- Interest Rate Risk: The standard deviation of interbank interest rates over the past five years, used as a proxy for interest rate volatility.
- Exchange Rate Risk: The standard deviation of exchange rate fluctuations over the past five years, calculated using the natural logarithm transformation.
- Financing Risk: The equity-to-total-assets ratio (ownership ratio) is used as an indicator of financing risk.
- Liquidity Risk: The firm's ability to convert shares into cash quickly; in the absence of sufficient demand, liquidity risk increases. It is calculated as follows:

$$Illiq_{i,t}=\frac{1}{N}\sum_{j=1}^{N_{i,t}}\sqrt{\frac{|R_{i,j}|}{Vol_{i,j}\ .\ P_{i,j-1}}}$$

In this calculation, $N_{i,t}$ represents the number of trading days for stock *i* in month *t*; $R_{i,j}$ denotes the stock return; $V_{oli,j}$ indicates the trading volume; and $P_{i,j-1}$ refers to the closing price of stock *i* on the previous day (Alizadeh and Shahiki Tash, 2020).

Sales Volatility: This variable represents fluctuations in the firm's sales over the past five years. It is measured by calculating the standard deviation of sales figures and then applying a natural logarithmic transformation.

Stock Price Crash Risk: If the stock price of a company experiences a severe decline during the year under review, it is considered to have undergone a price crash. This variable is measured using *skewness* as follows:

$$NCSKEW_{j,t}=-\left(\frac{n(n-1)^{\frac{3}{2}}\sum w^{3}{}_{j,t}}{n-(n-1)\left(n-2\left(\sum w_{j,t}{}^{2}\right)^{\frac{3}{2}}\right)}\right)$$

The *stock price crash risk* is calculated from firm-specific monthly returns, denoted as W, which are obtained using Equations (1) and (2). To compute this risk, the *residual returns* ($W_{i,t}$) are first estimated using the following regression model:

$$W_{i,t}=LN(1+e_{i,t}) \qquad (1)$$

$$R_{i,t}=\alpha_0+\beta_1 R_{m,t-2}+\beta_2 R_{m,t}+\beta_3 R_{m,t}+\beta_4 R_{m,t+1}+\beta_5 R_{m,t+2}+e_{i,t} \qquad (2)$$

In this equation, R_i represents the monthly return of firm *i*, R_m denotes the monthly market return (based on the market index), and *t* refers to the month of the year.

Accordingly, *crash periods* for a given stock are defined as those months in which the firm-specific return (W_i) is less than the mean of all W_i values for that year minus two-thirds of the standard deviation. Therefore, if in a given year one or more W_i values fall below this threshold, it indicates that a stock price crash occurred that year. In such cases, the *Crash* dummy variable equals 1; otherwise, it equals **0**.

Dividend Reduction: A binary variable that equals **1** if the cash dividend approved by the general shareholders' meeting has been paid, and **zero** otherwise.

Research and Development (R&D) Risk: Calculated as the ratio of *R&D expenditure* (extracted from the notes to the financial statements) to *total assets*. This variable reflects the firm's efforts to innovate and differentiate.

Market Competition: The firm's competitive power is measured using the *Lerner Index* (the ratio of operating profit to sales revenue), which serves as an indicator of market competitiveness.

Marketing and Advertising Risk: Defined as the *standard deviation* of marketing and advertising expenses over five years (the current year plus the four preceding years), scaled by total assets. This variable represents fluctuations in marketing-related risk.

Inflation Risk: Calculated as the *standard deviation of inflation rates* over the past five years, serving as an indicator of inflationary risk that reflects the decline in the purchasing power of investments.

Political Risk: Defined as the potential decline in investment value arising from changes in political systems or government policies. The related indicators such as government stability, legal quality, and governance effectiveness—are extracted from the *Worldwide Governance Indicators (WGI)* database.

Economic Risk: Represents the risk of capital loss for foreign investors resulting from regulatory and structural changes in the economy. This variable is defined as a function of government size, tax revenue, and oil revenue (each as a ratio to Gross Domestic Product), along with the regression residuals, serving as a composite measure of economic risk.

Government Size, Tax Revenue, and Oil Revenue: Respectively measured as the ratio of government expenditure, total tax revenue, and oil revenue to Gross Domestic Product (GDP), all employed to analyze the degree of economic risk.

Downside Risk: The probability of a decline in the value of an asset or investment, or the magnitude of potential losses. It measures only *unfavorable deviations* from the expected return and is calculated as follows:

$$\sqrt{\frac{\sum_{i=1}^{n}(min[(R_i - u), 0])^2}{n}}$$

In this equation, *n* represents the number of trading days for the company's stock during the year, *R* denotes the daily stock return, and *u* indicates the average daily stock return for the same period.

- ***Market Risk:*** Arises from fluctuations in the prices of assets such as stocks, bonds, and gold. It is calculated as the *ratio of the covariance between the stock return and the market return to the variance of the market return* (based on the overall market index).
- ***Tax Risk:*** A non-operational risk stemming from corporate tax avoidance strategies. It is measured using the *standard deviation of tax avoidance*, defined as the ratio of total taxes to income divided by total assets, over the past three years.
- ***Financing (Loan) Risk:*** Represents the risk of default or failure to repay loans and credit facilities. It is measured by the *standard deviation of total loans and facilities* over the past five years, extracted from the firms' financial statements.

These variables quantitatively model the risks associated with *market volatility, tax regulation uncertainty,* and *credit obligations* within the firm's financial environment.

Moderating variables

The moderating variable in this study is *internal audit competence*, which comprises four major dimensions as follows:

1. ***Professional Competence:*** This dimension reflects the auditor's mastery of specialized knowledge and technical expertise required for professional performance. It includes proficiency in internal auditing practices and standards; familiarity or expertise in independent auditing, fraud auditing, and forensic accounting; mastery of internal control frameworks, risk management, and corporate governance systems; awareness or proficiency in relevant laws, regulations, and compliance requirements; familiarity or expertise in information technology auditing; general and technical proficiency in the English language; understanding of microeconomic and

macroeconomic concepts; familiarity with qualitative frameworks; and competence in statistical, software, and analytical skills.

2. ***Environmental Competence:*** This includes *individual, group*, and *organizational communication competence*, enabling effective interaction and collaboration across organizational levels.
3. ***Managerial Competence:*** This dimension encompasses *motivational competence, goal-setting competence, decision-making competence, monitoring and evaluation competence*, and *leadership competence*—skills essential for directing audit activities and ensuring alignment with organizational objectives.
4. ***Personal Competence:*** This refers to *innate personality traits* and *acquired personal attributes* that influence auditors' ethical judgment, professional behavior, and adaptability in dynamic organizational contexts.

- To identify and extract the components and indicators of internal audit competency, a questionnaire was used. The questionnaire was developed using the meta-synthesis method based on the seven-step model proposed by Sandelowski and Barroso. At this stage, a set of credible domestic and international studies was systematically collected and analyzed. To validate and complement the findings, semi-structured interviews were also conducted with experts in the field of internal auditing.
- To obtain the latent variables of the study—each of which consists of several questions—the latent variables were derived by calculating the average of the received responses. Moreover, the risk disclosure variable itself was calculated using three sub-indices (strategic risk disclosure, financial risk disclosure, and operational risk disclosure) through exploratory factor analysis.

Additionally, internal audit competencies were calculated once using the arithmetic mean of four components—environmental, professional, managerial, and personal competencies—by assigning equal weights (Internal Audit Competencies 1). Furthermore, internal audit competencies (Internal Audit Competencies 2) were also computed using exploratory factor analysis of the same four components.

Findings and Results

Descriptive statistical information, including the standard deviation, minimum, and maximum values of the study's latent variables, is presented in *Table 1*.

Table 1. Descriptive statistics of latent variables

Variable	Latin Equivalent	Observations	Mean	Std. Deviation	Minimum	Maximum
Strategic Risk Disclosure	*Strisk*	94	0.029	0.097	0.000	0.631
Financial Risk Disclosure	*Firisk*	94	3.614	8.614	0.400	57.044
Operational Risk Disclosure	*Oprisk*	94	0.051	0.043	–0.121	0.262
Overall Risk Disclosure	*Risk*	94	0.212	0.485	0.017	3.214
Environmental Competence	*Environmental*	94	3.052	0.684	1.25	5.00
Professional Competence	*Professional*	94	3.063	0.715	1.286	5.00
Managerial Competence	*Managerial*	94	3.086	0.762	1.40	5.00
Individual Competence	*Individual*	94	2.618	0.272	2.139	3.389
Internal Audit Competence (Method 1)	*IAC1*	94	2.955	0.537	1.658	4.453
Internal Audit Competence (Method 2)	*IAC2*	94	0.675	0.102	0.442	0.969
Abnormal Stock Return	*Abreturn*	94	0.011	0.021	–0.045	0.059

Table 2 presents the exploratory factor loadings used to calculate the *risk disclosure* variable. Based on the computed coefficients, it can be inferred that *operational risk* carries the greatest weight in risk disclosure, followed by *financial risk*, and, finally, *strategic risk.*

Table 2. Exploratory factor loadings for the risk disclosure variable

Variable	Strisk	FiRisk	Oprisk
Coefficient (Loading)	0.029	0.056	0.175

Similarly, Table 3 presents the exploratory factor loadings for the Internal Audit Competence variable (2). The results indicate that *individual competence* carries the greatest weight, whereas *professional competence* carries the least. Following individual competence, managerial competence, and then environmental competence rank next in importance.

Table 3. Exploratory factor loadings for the variable internal audit competence (2)

Variable	Environmental	Professional	Managerial	Individual
Coefficient (Loading)	0.060	0.010	0.066	0.096

Table 4 and Figure 2 present the Pearson correlation coefficients for the study's latent constructs. The correlation between *internal audit competence* and *abnormal stock returns* is *negative and significant* at the **99% confidence level.** Specifically, the correlation coefficient for variable IAC1 is –0.095, while that for IAC2 is –0.087, indicating that the relationship is slightly stronger for IAC1.

Furthermore, the correlation between *risk disclosure* and *abnormal stock returns is positive and significant* at the **95% confidence level** (r = 0.207), suggesting that increases in one variable are associated with increases in the other.

Table 4. Pearson correlation matrix of latent variables

Variable	Strisk	Firisk	Oprisk	Risk	Environmental	Professional	Managerial	Individual	IAC1	IAC2	Abreturn
Strisk	1										
Firisk	0.999***	1									
Oprisk	–0.084	–0.083	1								
Risk	0.999***	0.999***	–0.068	1							
Environmental	0.181	0.180	–0.055	0.179	1						
Professional	0.165	0.163	–0.025	0.163	0.964***	1					
Managerial	0.215**	0.214**	–0.013	0.214**	0.901***	0.935***	1				
Individual	0.065	0.063	0.119	0.065	0.061	0.067	0.081	1			
IAC1	0.197	0.196	–0.016	0.196	0.966***	0.980***	0.963***	0.197	1		
IAC2	0.208**	0.207**	–0.0001	0.207**	0.936***	0.942***	0.948***	0.327***	0.989***	1	
Abreturn	0.011	0.012	–0.105	0.010**	0.128	0.102	0.059	–0.009	–0.095**	–0.087**	1

Note: ($p < 0.05$) and $p < 0.01$ (***) indicate significance at the 95% and 99% confidence levels, respectively.

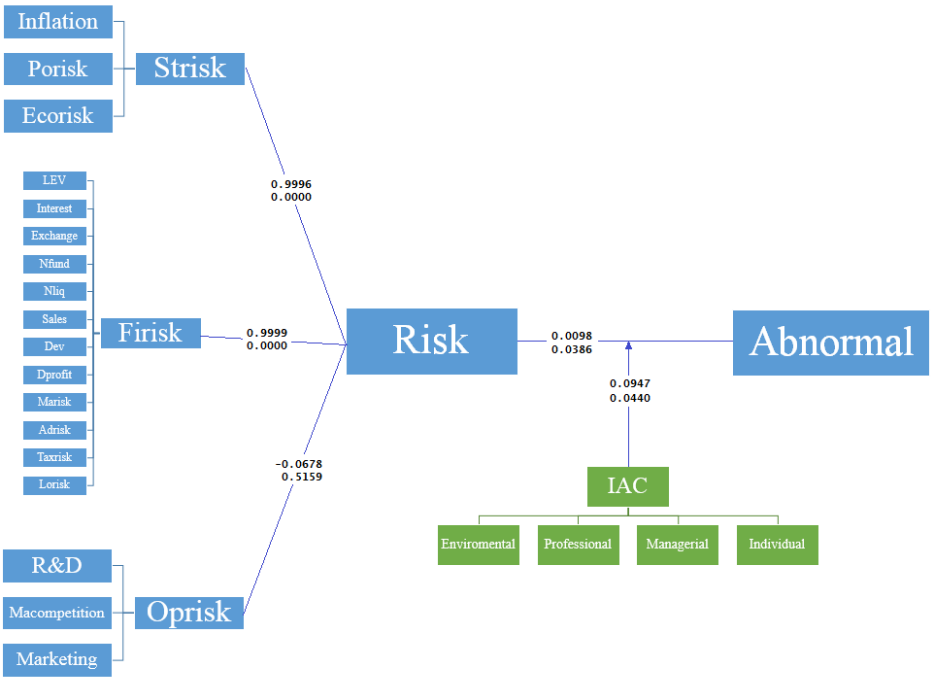

Figure 2. Structure of Relationships between Observed and Latent Variables in the Questionnaire

In this study, the Multivariate Analysis of Covariance (MANCOVA) method was employed to analyze multiple independent variables simultaneously. A prerequisite for applying this technique is verifying the *normality* of the data, which was tested using the *Kolmogorov–Smirnov test*. The results presented in Table 5 indicate that all variables follow a normal distribution, thereby confirming the null hypothesis of normality.

Table 5. Kolmogorov–Smirnov Test for Normality of variables

Variable	p-value	Variable	p-value
Abreturn	0.433	IAC1	0.976
Risk	0.330	IAC2	0.794

One of the key assumptions of covariance analysis is the *homogeneity of regression slopes*, which was tested by examining the interaction between the pretest and the hypotheses at the posttest stage. The results indicated that the interaction effects were not statistically significant, implying that the assumption of homogeneous regression slopes holds (as confirmed by the non-significant results in Table 6). Therefore, with this assumption satisfied, the application of Analysis of Covariance (ANCOVA) is both valid and appropriate for this study.

Table 6. Test results for Homogeneity of regression slopes

Relationship	Sum of Squares	Mean Square	Degrees of Freedom (df)	F-Statistic	Significance (p-value)
Effect of Risk Disclosure on Abnormal Stock Returns	1.726	1.726	1	1.064	0.435
Moderating Role of Internal Audit Competence 1 in the Relationship between Risk Disclosure and Abnormal Stock Returns	2.170	2.170	1	0.550	0.415
Moderating Role of Internal Audit Competence 2 in the Relationship between Risk Disclosure and Abnormal Stock Returns	1.400	1.400	1	0.680	0.409

Given that the assumptions listed above (see Table 7) are satisfied, the necessary conditions for applying *Analysis of Covariance (ANCOVA)* to test the research hypotheses are met. The results of the *one-way ANCOVA test* are presented in Table 7. According to the findings, the significance level (p-value) of the ANOVA test is greater than 0.05; therefore, the null hypotheses of the study cannot be rejected.

Table 7. Results of the one-way analysis of covariance (ANCOVA)

Source	Sum of Squares	Mean Square	F-Statistic	df	Significance (p-value)	Eta (Effect Size)
Effect of Risk Disclosure on Abnormal Stock Returns	Pretest × Group	13.556	0.019	0.74	1	0.755
	Error	13.358	0.019			
Moderating Role of Internal Audit Competence 1 in the Relationship between Risk Disclosure and Abnormal Stock Returns	Pretest × Group	16.879	1.206	0.716	1	0.737
	Error	36.393	1.685			
Moderating Role of Internal Audit Competence 2 in the Relationship between Risk Disclosure and Abnormal Stock Returns	Pretest × Group	15.197	1.086	2.517	1	0.107
	Error	3.131	0.431			

The results of the covariance analysis presented in Table 8 indicate that the *F-statistic* is significant at the 99% confidence level for all research hypotheses, which includes both the direct effect of risk disclosure on abnormal stock returns and the moderating effects of internal audit competence measured using both computational approaches.

Table 8. Results of the test of between-group effects

Relationship	Sum of Squares	Mean Square	F-Statistic	Degrees of Freedom (df)	Significance (p-value)
Effect of Risk Disclosure on Abnormal Stock Returns	3.689	3.689	2.169	1	0.004
Moderating Role of Internal Audit Competence 1 in the Relationship between Risk Disclosure and Abnormal Stock Returns	6.785	6.875	9.690	1	0.000
Moderating Role of Internal Audit Competence 2 in the Relationship between Risk Disclosure and Abnormal Stock Returns	11.225	11.225	12.460	1	0.000

To further examine the research hypotheses and determine the direction and strength of the relationships, the Ordinary Least Squares (OLS) method was employed. The results of the model estimation based on the leading hypotheses are presented in Table 9. The coefficient for the effect of risk disclosure on abnormal stock returns is 0.002, which is statistically significant at the 99% confidence level, indicating that *r*isk disclosure positively influences abnormal stock returns. Moreover, when internal audit competence is included as a moderating variable, the estimated coefficients become negative. However, the interaction term *Risk × IAC1* is not statistically significant. In contrast, the coefficient for *Risk × IAC2* is **–**0.039, significant at the 99% confidence level, confirming the moderating effect of *Internal Audit Competence 2* on the relationship between risk disclosure and abnormal stock returns.

Table 9. Direction and magnitude of effects based on research hypotheses

Relationship	Coefficient (β)	p-value	Conclusion
Abreturn ← Risk	0.002	0.007	Risk disclosure has a significant positive effect on abnormal stock returns.
Abreturn ← Risk × IAC1	–0.021	0.095	The moderating role of Internal Audit Competence 1 is not confirmed.
Abreturn ← Risk × IAC2	–0.039	0.004	The moderating role of Internal Audit Competence 2 is confirmed.

To achieve a more precise and realistic evaluation of the research hypotheses, the *Structural Equation Modeling (SEM)* approach was employed. The advantage of SEM over the OLS method lies in its ability to estimate coefficients *simultaneously*, treating all equations as part of a unified system. The results of this estimation are presented in Table 10. In Model (1), the effect of *risk disclosure on abnormal stock returns* was examined. The estimated coefficient was 0.043, which is statistically significant at the 99% confidence level. Therefore, the first hypothesis—that there is a significant relationship between risk disclosure and abnormal stock returns—is confirmed at the 99% confidence level. In both Models (2) and (3), the coefficient for *risk disclosure* remains positive and significant. In Model (2), the coefficient for *IAC1* (Internal Audit Competence 1) is –0.017, significant at the 95% confidence level. This finding suggests that Internal Audit Competence 1 contributes to lower abnormal stock returns. However, the interaction term *Risk × IAC1* is not statistically significant, indicating that Internal Audit Competence 1 does not moderate the relationship.

In Model (3), the coefficient for *IAC2* (Internal Audit Competence 2) is –0.129, significant at the 99% confidence level, implying that this variable also contributes to a reduction in abnormal stock returns. Additionally, the interaction term *Risk × IAC2* is –0.079, significant at the 99% confidence level. Therefore, the second hypothesis, which posits that internal audit competence has a *significant moderating effect* on the relationship between risk disclosure and abnormal stock returns, is *confirmed* when measured using IAC2.

Table 10. Structural equation modeling (SEM) results for the main research hypotheses

Variable	Model 1		Model 2		Model 3	
	Coefficient (β)	p-value	Coefficient (β)	p-value	Coefficient (β)	p-value
Risk	0.043	0.007	0.032	0.018	0.048	0.001
IAC1	—	—	–0.017	0.020	—	—
IAC2	—	—	—	—	–0.129	0.000
Risk × IAC1	—	—	–0.006	0.091	—	—
Risk × IAC2	—	—	—	—	–0.079	0.000
Constant	0.011	0.000	–0.001	0.960	–0.001	0.910
Observations (n)	94		94		94	

To examine the *sub-hypotheses* of the study, the first model evaluated the impact of the *subcomponents of risk disclosure on abnormal stock returns*. The estimated coefficients for *strategic risk disclosure* (0.455), *financial risk disclosure* (0.005), and *operational risk disclosure* (0.060) were all statistically significant. Accordingly, Sub-Hypotheses 1 through 3 are confirmed: *strategic* and *operational risk disclosures* are significant at the 99% confidence level, while *financial risk disclosure* is significant at the 95% confidence level. In the second model, only the interaction term *FiRisk × IAC1* was significant, with a coefficient of –0.098 at the 95% confidence level. This finding confirms that *Internal Audit Competence (1)* moderates the relationship between *financial risk disclosure and abnormal stock returns* (thus supporting Sub-Hypothesis 4). However, Sub-Hypotheses 5 and 6 are not supported (Table 11).

Table 11. Structural equation modeling (SEM) results for the sub-hypotheses

Variable	Model 1		Model 2		Model 3	
	Coefficient (β)	p-value	Coefficient (β)	p-value	Coefficient (β)	p-value
Strisk	0.455	0.004	0.176	0.004	0.631	0.020
FiRisk	0.005	0.013	0.032	0.018	0.056	0.000
OpRisk	0.060	0.001	0.150	0.068	0.274	0.000
IAC1	—	—	–0.020	0.016	—	—
IAC2	—	—	—	—	–0.049	0.004
Strisk × IAC1	—	—	–0.009	0.342	—	—

FiRisk × IAC1	—	—	–0.098	0.011	—	—
OpRisk × IAC1	—	—	–0.842	0.068	—	—
Strisk × IAC2	—	—	—	—	–0.109	0.024
FiRisk × IAC2	—	—	—	—	–0.572	0.000
OpRisk × IAC2	—	—	—	—	–1.370	0.000
Constant	0.008	0.514	0.013	0.848	0.034	0.675
Observations (n)	94		94		94	

In the third model, the coefficient of the interaction variable *Firisk* × Iac_2 was negative (–0.572) and statistically significant at the 99% confidence level. Similarly, the coefficients of the interaction terms *Strisk* × Iac_2 and *Oprisk* × Iac_2 were negative (–0.109 and –1.370) and significant at the 95% and 99% confidence levels, respectively. Therefore, based on the characteristics of *Internal Audit Competence (Model 2),* the fourth, fifth, and sixth sub-hypotheses—regarding the moderating role of these competencies in the relationship between financial, strategic, and operational risk disclosures and abnormal stock returns—are confirmed at the 99%, 95%, and 99% confidence levels, respectively.

Discussion and Conclusion

The findings of this study provide robust empirical evidence that risk disclosure exerts a significant influence on firm value, as reflected in abnormal stock returns, and that this relationship is meaningfully conditioned by the competence of internal auditors. The results indicate that higher levels of risk disclosure are associated with stronger market reactions, suggesting that investors actively incorporate disclosed risk information into their valuation decisions. This outcome reinforces the argument that risk disclosure functions as a value-relevant signal rather than merely a compliance-driven reporting activity (1, 4). The positive association observed between risk disclosure and firm value aligns with the premise that transparent communication of uncertainty reduces information asymmetry and enhances investor confidence, particularly in environments characterized by elevated economic and institutional risk (3, 5).

A more nuanced examination of the results reveals that not all categories of risk disclosure contribute equally to firm value. Operational and strategic risk disclosures exhibit stronger and more consistent effects on abnormal returns than purely financial risk disclosures. This finding suggests that investors place greater weight on information related to firms' core processes, resilience, and long-term strategic positioning than on traditional financial risk metrics alone. Such evidence is consistent with prior research emphasizing that markets increasingly value forward-looking and non-financial risk information, especially in contexts of uncertainty and rapid environmental change (7, 31). Strategic and operational risks often signal managerial foresight and organizational adaptability, which may explain their stronger valuation relevance.

The significant moderating role of internal audit competence constitutes one of the most important contributions of this study. The results demonstrate that internal audit competence alters both the magnitude and direction of the relationship between risk disclosure and firm value. Specifically, higher levels of internal audit competence attenuate excessive market reactions to risk disclosure, leading to more stable and less volatile abnormal returns. This pattern suggests that competent internal auditors enhance the credibility, balance, and interpretability of disclosed risk information, thereby preventing overreaction or mispricing by investors. This finding extends prior governance research by demonstrating that internal audit functions do not merely influence disclosure quantity but fundamentally shape how disclosed information is processed by the market (13, 14).

From a theoretical perspective, these findings are strongly aligned with signaling theory. Risk disclosure serves as a signal of managerial quality and transparency, yet the effectiveness of this signal depends on its perceived credibility. Internal audit competence strengthens this credibility by ensuring that disclosed risks are accurately identified, consistently reported, and appropriately contextualized. As a result, investors are more likely to interpret risk disclosures as informative rather than opportunistic when firms possess strong internal audit capabilities (12, 33). This moderating mechanism helps reconcile previously mixed empirical findings regarding the valuation effects of risk disclosure.

The negative main effect of internal audit competence on abnormal stock returns, observed alongside its positive moderating role, deserves careful interpretation. Lower abnormal returns in firms with higher internal audit competence may reflect reduced information surprises and diminished speculative trading opportunities. In other words, competent internal auditing contributes to more efficient pricing by narrowing the gap between expected and realized information, thereby limiting abnormal market movements. This interpretation is consistent with evidence that stronger internal control systems reduce earnings management and reporting volatility (6, 24). Rather than suppressing firm value, internal audit competence appears to stabilize it.

The findings also resonate with the corporate governance literature emphasizing the complementary roles of internal and external monitoring mechanisms. While audit committees and boards provide strategic oversight, internal auditors operate closer to operational processes and information flows. Their competence enables them to translate governance objectives into effective risk assessment and disclosure practices. This study's results suggest that without adequate internal audit competence, governance reforms and disclosure mandates may fail to achieve their intended market effects (10, 11). Internal audit competence thus emerges as a critical link between governance structures and capital market outcomes.

The relevance of internal audit competence is further amplified in emerging markets, where institutional constraints, regulatory enforcement gaps, and economic volatility heighten investor sensitivity to risk information. In such contexts, credible internal controls serve as substitutes for weaker external enforcement mechanisms. The results support prior evidence indicating that governance and auditing quality play a disproportionately important role in shaping disclosure outcomes in emerging economies (23, 32). Internal audit competence, by enhancing informational reliability, may compensate for broader institutional deficiencies.

Recent developments in digital transformation and artificial intelligence-assisted auditing provide additional context for interpreting the findings. Advanced analytical tools and data-driven audit techniques enhance auditors' ability to identify complex and emerging risks, particularly those related to technology, sustainability, and strategic disruption. Firms that invest in developing such competencies are likely better positioned to deliver high-quality risk disclosures that markets perceive as credible and forward-looking (19, 20). The moderating effect observed in this study may therefore become even more pronounced as audit technologies continue to evolve.

The results also have implications for sustainability and climate risk disclosure. As firms increasingly disclose climate-related risks, the role of internal auditors in validating assumptions, scenarios, and metrics becomes critical. Prior studies suggest that climate risk disclosure can either enhance or undermine firm value depending on its quality and credibility (7, 8). The present findings imply that internal audit competence may be a decisive factor in determining whether such disclosures are interpreted as proactive risk management or as indicators of vulnerability.

Overall, the findings of this study suggest that risk disclosure should be understood as a systemic process embedded within internal control and governance frameworks. Its impact on firm value cannot be fully explained

without accounting for the quality of internal mechanisms that generate and validate disclosed information. Internal audit competence plays a central role in this system by enhancing disclosure credibility, moderating market reactions, and contributing to more efficient valuation processes. These insights advance the literature by integrating internal auditing more explicitly into models of disclosure and firm value (2, 9).

Despite its contributions, this study is subject to several limitations. The analysis is based on a single market context, which may limit the generalizability of the findings to other institutional settings with different regulatory environments and investor behaviors. Additionally, the measurement of internal audit competence, while multidimensional, relies on available indicators that may not fully capture informal skills or organizational culture. The use of abnormal stock returns as a proxy for firm value, although well established, reflects short-term market reactions and may not capture long-term valuation effects.

Future research could extend this study by conducting cross-country comparisons to examine whether the moderating role of internal audit competence varies across legal systems and levels of market development. Longitudinal designs could also explore how changes in audit competence over time influence disclosure credibility and firm value dynamics. Moreover, future studies may investigate specific components of internal audit competence, such as technological expertise or sustainability-related knowledge, to determine which dimensions are most influential in shaping market responses to risk disclosure.

From a practical perspective, firms should prioritize strengthening internal audit competence as part of their broader governance and risk management strategies. Investments in continuous professional training, advanced audit technologies, and cross-functional collaboration can enhance auditors' ability to support high-quality risk disclosure. Regulators and professional bodies may also consider developing competency-based standards and certification frameworks to ensure that internal audit functions are equipped to meet growing disclosure demands. By doing so, organizations can improve disclosure credibility, stabilize market reactions, and support sustainable firm value creation.

Acknowledgments

We would like to express our appreciation and gratitude to all those who helped us carrying out this study.

Authors' Contributions

All authors equally contributed to this study.

Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

All ethical principles were adheried in conducting and writing this article.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

Funding

This research was carried out independently with personal funding and without the financial support of any governmental or private institution or organization.

References

1. Weber V, Müßig A. The effect of business strategy on risk disclosure. Accounting in Europe. 2022;19(1):190-225. doi: 10.1080/17449480.2021.2018473.
2. Velte P. Which attributes of audit committees are most beneficial for European companies? Literature review and research recommendations. Journal of Global Responsibility. 2023;14(4):403-30. doi: 10.1108/JGR-07-2022-0063.
3. Santos MR, Laureano RM. Developing a vulnerability-based conceptual model for managing risk in non-profit projects: A multicase study in a European country. Public Management Review. 2023;25(2):313-39. doi: 10.1080/14719037.2021.1972685.
4. Jain S, Raithatha M. Risk disclosures and firm value: the role of governance in an emerging market. International Journal of Productivity and Performance Management. 2022;71(8):3205-27. doi: 10.1108/IJPPM-09-2020-0476.
5. Gull AA, Abid A, Hussainey K, Ahsan T, Haque A. Corporate governance reforms and risk disclosure quality: evidence from an emerging economy. Journal of Accounting in Emerging Economies. 2023;13(2):331-54. doi: 10.1108/JAEE-11-2021-0378.
6. Zafar R, Millatina F, Mukhtar M, Astuti KD, Ismail T. Antecedents of disclosure on internal control and earnings management. Journal of Asian Finance, Economics and Business. 2021;8(3):0391-7.
7. Megeid NSA. The impact of climate risk disclosure on financial performance, financial reporting and risk management: evidence from Egypt. Future Business Journal. 2024;10(1):21. doi: 10.1186/s43093-024-00309-5.
8. Salah W, Hassaan M. Climate change disclosure in egyptian firms and its key-determinants following the implementation of financial regulatory authority Decree. Researchgate. 2024;1(108):1-22. doi: 10.21608/alat.2024.339231.
9. Blanco B, Guillamón-Saorín E, Guiral A. The two sides of corporate social responsibility and the quality of internal control audit opinions. International Journal of Auditing. 2024;28(1):226-50. doi: 10.1111/ijau.12328.
10. Al-Dubai SAA, Alotaibi KO. Examining the relationship between board characteristics and financial risk disclosure: A longitudinal analysis based on agency theory. Corporate Governance and Organizational Behavior Review. 2023;7(4):137-51. doi: 10.22495/cgobrv7i4p12.
11. Almunawwaroh M, Setiawan D. Does audit committee characteristics a driver in risk disclosure? Cogent Business & Management. 2023;10(1):2167551. doi: 10.1080/23311975.2023.2167551.
12. Velte P. The impact of external auditors on firms' financial restatements: a review of archival studies and implications for future research. Management Review Quarterly. 2023;73(3):959-85. doi: 10.1007/s11301-022-00264-x.
13. Mardessi S. Audit committee and financial reporting quality: the moderating effect of audit quality. Journal of Financial Crime. 2022;29(1):368-88. doi: 10.1108/JFC-01-2021-0010.
14. Noor A, Farooq M, Tahir Z. Nexus between audit committee and corporate risk: evidence from Pakistan. Corporate Governance: The international journal of business in society. 2022;22(6):1327-44. doi: 10.1108/CG-11-2021-0418.
15. ElHawary E. Audit committee effectiveness and company performance: Evidence from Egypt. Journal of Governance and Regulation. 2021;10(2):134-56. doi: 10.22495/jgrv10i2art12.
16. Sharpe WH, Carey P, Zhang HF. Being private, Big 4 auditors, and debt raising. Accounting & Finance. 2023;63(2):2295-345. doi: 10.1111/acfi.12969.
17. Müller JC, Kern EM, Holling JM. Intraorganisational knowledge transfer in security-critical environments: a conceptual framework for high reliability organisations. European Journal for Security Research. 2021;6(1):1-20. doi: 10.1007/s41125-020-00067-9.
18. Oghuma RI, Garuba AO. Corporate governance and risk disclosures in Nigerian banks. Indian Journal of Commerce and Management Studies. 2021;12(1):19-32. doi: 10.18843/ijcms/v12i1/03.
19. Gökoğlan K, Sevim H, Kılıç S. Digital Transformation and Artificial Intelligence-Assisted Auditing: The Role of Technology in Internal Audit Processes in 2025. Dynamics in Social Sciences and Humanities. 2025;6(1):25-33. doi: 10.62425/dssh.1647929.
20. Moshayekhi B, Amirollah MR. The Impact of Knowledge and Professional Skepticism of Internal Auditors on the Adoption of Artificial Intelligence. Experimental Accounting Research. 2025;15(2):1-28. doi: 10.22051/jera.2025.50268.3523.

21. Masoumi Bilandi Z, Tabatabaiyan MS, Youssefzadeh N. Challenges, Barriers, and Solutions for Integrating Information Technology in Internal Auditing. Empirical Studies in Financial Accounting. 2025;22(87):1-36. doi: 10.22054/qjma.2024.82520.2625.
22. Zaman R, Farooq MB, Khalid F, Mahmood Z. Examining the extent of and determinants for sustainability assurance quality: The role of audit committees. Business Strategy and the Environment. 2021;30(7):2887-906. doi: 10.1002/bse.2777.
23. Sharif MJ, Islam AF. Corporate governance and risk disclosure: evidence from listed pharmaceuticals and chemicals companies of Bangladesh. Researchgate. 2021;1(1):17-28.
24. Alshirah M, Alshirah A, Lutfi A. Audit committee's attributes, overlapping memberships on the audit committee and corporate risk disclosure: Evidence from Jordan. Accounting. 2021;7(2):423-40. doi: 10.5267/j.ac.2020.11.008.
25. Kao MF, Shiue MJ, Tseng CH. Voluntary audit committees, auditor selection and audit quality: evidence from Taiwan. Managerial Auditing Journal. 2021;36(4):616-42. doi: 10.1108/MAJ-04-2020-2632.
26. Kiflee AKR, Ali Khan MNA. The effect of performance and corporate governance to risk disclosure among listed companies in Malaysia. Asia-Pacific Management Accounting Journal (APMAJ). 2021;16(1):119-61. doi: 10.24191/APMAJ.V16i1-06.
27. Elmarzouky M, Hussainey K, Abdelfattah T. The key audit matters and the audit cost: does governance matter? International Journal of Accounting & Information Management. 2023;31(1):195-217. doi: 10.1108/IJAIM-08-2022-0178.
28. Elmarzouky M, Hussainey K, Abdelfattah T. Key audit matters: a systematic review. International Journal of Accounting, Auditing and Performance Evaluation. 2024;20(3-4):319-41. doi: 10.1504/IJAAPE.2024.138473.
29. Masoud N. Moderating Effect of Sustainable Innovation on Internal Audit Effectiveness and Sustainability Auditing Practices: Evidence from Libya's Public Sector. International Journal of Financial Studies. 2025;13(2):69. doi: 10.3390/ijfs13020069.
30. Heydari M, Charmahalizadeh AA, Matinfard M. Designing and Validating a Local Conceptual Model for Internal Audit Performance Evaluation in Iran's Petrochemical Industry Using a Mixed-Methods Approach. Iranian Internal Audit Research Journal. 2025;2(1):1-25.
31. Fiandrino S, Gromis di Trana M, Tonelli A, Lucchese A. The multi-faceted dimensions for the disclosure quality of non-financial information in revising directive 2014/95/EU. Journal of Applied Accounting Research. 2022;23(1):274-300. doi: 10.1108/JAAR-04-2021-0118.
32. Mohammad N, Ismail RF, Zainon S, Mohd Abdul Kadir J. Corporate governance and operational risk disclosure: evidence from shariah-compliant companies in Malaysia. Asia-Pacific Management Accounting Journal (APMAJ). 2021;16(3):31-53. doi: 10.24191/APMAJ.v16i3-02.
33. Haj-Salem I, Hussainey K. Risk disclosure and corporate cash holdings. Journal of Risk and Financial Management. 2021;14(7):328. doi: 10.3390/jrfm14070328.