Challenges of Risk-Based Auditing in Non-Financial Domains (Compliance Risk, Operational Risk)

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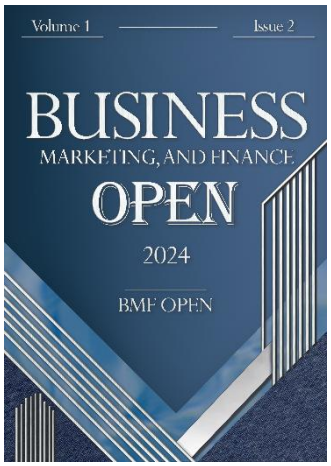

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Abstract: Risk-based auditing in non-financial domains is considered a crucial tool for risk management and ensuring the achievement of an organization's strategic objectives. The use of appropriate methods and techniques, along with sufficient knowledge and experience in the relevant audit domain, can enhance the efficiency and effectiveness of this type of audit. The aim of this study is to examine the challenges of risk-based auditing in non-financial domains (compliance risk, operational risk). Auditing non-financial risks may encounter resistance to change from employees and management. This resistance may stem from fears of exposing weaknesses or an unwillingness to alter existing procedures. The reporting of risk-based audit findings in non-financial areas must be structured in a way that is comprehensible and useful to management. Reports should include the identification of significant risks, an assessment of the effectiveness of controls, and recommendations for improvement. The findings of the study indicate that risk-based auditing in non-financial domains requires a deep understanding of the business, relevant laws and regulations, and the operational environment. Therefore, based on the study's findings, auditors must possess specific skills and be able to address challenges related to risk identification, assessment, implementation, reporting, and follow-up.

Keywords: Risk-based auditing, non-financial domains, compliance risk, operational risk.

1. Introduction

Risk-Based Auditing (RBA) is a systematic approach to planning and conducting audits that focuses on identifying, assessing, and responding to risks associated with audit objectives [1, 2]. Unlike the traditional approach, which applies uniform audit procedures based on predefined protocols, RBA strategically allocates audit resources to areas with the highest probability of error or fraud. Risk-based auditing in non-financial domains requires a deep understanding of business operations, relevant laws and regulations, and the operational environment. Auditors must possess specialized skills and be able to address challenges related to risk identification, assessment, implementation, reporting, and follow-up [3, 4].

Operational risk is generally defined as arising from human errors, unforeseen events, or technical failures. This risk includes fraud (where traders provide false information), management errors, and deficiencies in control mechanisms [5]. Technical failures may result from defects in transaction processing systems, transfer mechanisms, or broader organizational issues [6, 7]. Auditing non-financial risks may encounter resistance to change from

employees and management. This resistance may stem from fears of exposing weaknesses or reluctance to alter existing procedures. The reporting of non-financial risk audit findings must be structured in a way that is comprehensible and useful to management [8-10]. Reports should include the identification of significant risks, an assessment of control effectiveness, and recommendations for improvement. Risk-based auditing in non-financial domains requires a thorough understanding of business operations, relevant regulations, and the operational environment [2, 11]. Auditors must possess specific skills and be able to manage challenges related to risk identification, assessment, implementation, reporting, and follow-up [12].

Auditing plays a fundamental and essential role in developing internal control methods for financial and non-financial matters, establishing internal control systems, assessing and evaluating internal control mechanisms, providing constructive recommendations for improving these systems, and assessing the effectiveness and efficiency of resource utilization within an enterprise. In this regard, financial, managerial, and operational systems, along with special reviews, fall within the scope of auditing activities. The scope of activities, methods, and tasks of internal auditing within an organization, as well as its reporting structure, must be explicitly defined, and competent individuals or groups must continuously evaluate the performance of internal auditing [11, 13]. Managers must also utilize the results of internal audit activities to enhance the organization and improve performance. Internal auditors must possess an accurate understanding of operations, processes, and company procedures to prevent and detect irregularities in internal control. Additionally, they must be able to design and implement tests to determine whether processes and procedures function as intended. Providing information on the adequacy and efficiency of internal control systems and the quality of a business unit's performance to the board of directors and executive managers is among the responsibilities of internal auditors. Companies that implement the best internal audit guidelines—those that employ leading practices and align with the strategic expectations and goals set by management and the board—generally have stronger control systems [14, 15].

The challenges of risk-based auditing in non-financial domains primarily stem from the inherent complexity of these areas and the intangible nature of many associated risks. Risk-Based Auditing (RBA) in non-financial domains, such as compliance risk and operational risk, faces numerous challenges. Non-financial risks are often more complex and intangible than financial risks [5, 16, 17]. Identifying and assessing these risks requires a deep understanding of business processes, relevant regulations, and the operational environment. The uncertainty surrounding the likelihood and impact of these risks complicates precise assessment [18, 19]. In many cases, adequate and reliable data for assessing non-financial risks are not available. This may result from inadequate data collection, improper data recording, or the absence of suitable reporting systems. Risk assessment is often based on expert judgment, which can lead to biases and inconsistencies in risk evaluation. Defining the scope of non-financial risk audits can be challenging [20, 21]. Auditors must ensure that the audit scope is broad enough to cover all significant risks while remaining sufficiently focused to be effectively managed.

Accessing necessary information for auditing non-financial risks can be difficult. Information may be scattered across different systems, or access to data may be restricted. Auditors must receive appropriate training in non-financial risks, relevant regulations, and risk auditing methods [2, 22]. They must also utilize suitable tools and techniques to identify, assess, and manage non-financial risks. These tools and techniques may include process analysis, employee interviews, document reviews, and control testing. Organizations should foster a risk-aware culture in which employees recognize existing risks and take responsibility for managing them. Auditors should collaborate and interact with other organizational units, including compliance, operations, and information technology departments. Identifying risks related to non-financial objectives involves determining the likelihood

of their occurrence and the severity of their consequences. This process includes methods such as process analysis, employee interviews, document reviews, and the use of checklists.

Risk assessment in non-financial domains often has a more qualitative nature and depends on the professional judgment of auditors. Developing an audit plan based on risk assessment and conducting appropriate audit tests to evaluate controls and identify weaknesses is crucial. Audit tests in non-financial domains may include document reviews, process observations, employee interviews, and internal control assessments. Risk-based auditing focuses on evaluating business processes and strategic processing [23, 24] and assessing objectives, risks, and controls that must align and integrate for organizational success. Internal auditing helps ensure the adequacy of resources and their alignment with priorities by identifying, assessing, and monitoring corporate risks (Jahanbani et al., 2010). Overall, risk-based auditing assesses high-risk areas and, more importantly, implements continuous risk assessment. The insights gained from comprehensive annual risk assessments, along with risk assessments conducted at the beginning of each audit engagement, should be shared with management and the board.

The objective of this study is to examine the challenges of risk-based auditing in non-financial domains, specifically compliance risk and operational risk.

2. Methodology

This study is applied in nature, employing a correlational and survey research method. The data collection tool is a questionnaire. By identifying specific indicators related to the application of risk-based auditing in non-financial domains (compliance risk, operational risk), these indicators were tested in selected Iranian companies. After extensive review and investigation, this study utilized the validated questionnaire developed by Castanheira et al. (2009). It is noteworthy that multiple-choice questions were employed to prevent misinterpretations and facilitate response processing. Additionally, to classify companies as small, medium, or large, previous studies conducted in Iran were also considered. In the findings section, the questions presented in the questionnaire and the percentage of responses received are provided.

The statistical population of this study comprises the heads of internal audit departments across all private, public, and government-owned companies, whether financial or non-financial, listed or unlisted, that have an internal audit unit. To this end, after thorough reviews and investigations, 63 companies with a defined internal audit unit were identified, and questionnaires were sent to their respective heads of internal audit. It is worth noting that a similar sampling method has been employed in many previous studies. Although many companies formally had an internal audit function, internal auditing in these companies was not clearly defined in its true sense. In many cases, only a single individual was responsible for internal auditing, and their activities were largely limited to tasks significantly below the standard levels of internal auditing. As a result, the sample size was restricted. Ultimately, after the final evaluations, 52 completed questionnaires were confirmed and processed. Additionally, in identifying companies with internal audit units, guidance and collaboration from numerous university professors and audit firm employees were utilized.

3. Findings and Results

Following the final reviews and data processing, the heads of internal audit from 82 companies completed the questionnaires. The classification of companies into small, medium, and large was conducted based on Castanheira et al.'s (2009) framework, using the number of employees as a criterion. Additionally, a review of studies conducted

in Iran helped refine this classification: companies with fewer than 500 employees were categorized as small, those with 500 to 1,000 employees as medium-sized, and those with more than 1,000 employees as large.

Among the 52 companies analyzed, 20 were classified as small, 16 as medium, and 16 as large. Thus, 40% were small, 30% medium, and 30% large. Additionally, 11 companies (21%) were financial firms, while 41 companies (79%) were non-financial. A total of 34 companies (65%) were privately owned, while 18 (35%) were non-private. Moreover, 23 companies (44%) were listed on the Tehran Stock Exchange, whereas 29 (56%) operated outside the stock market.

In terms of annual internal audit planning, companies were asked about the number of units under audit responsibility, the basis for determining audit responsibilities, the review period for audit responsibilities, the method used for designing annual audit plans, and the key risk factors considered in risk-based auditing. The responses to these questions are summarized in Table 1.

Table 1. Annual Internal Audit Planning

Question	Response Options	Count	%
In your company, how many units fall under the internal audit scope?	≤ 20 units	29	55
	> 20 and ≤ 50 units	13	25
	> 50 and ≤ 100 units	3	6
	> 100 and ≤ 500 units	7	14
In your company, how is the internal audit scope determined?	Based on the organization's strategic plans	14	27
	Independently determined by the head of the audit department, separate from organizational strategy	15	29
	Other	23	44
In your company, what is the review period for the internal audit scope?	≤ 1 year	9	17
	> 1 year and ≤ 2 years	15	29
	> 2 years and ≤ 3 years	8	15
	> 3 years	20	39
In your company, which method is used to design annual audit plans?	Risk-Based Method	8	15
	Cycle-Based Method	30	58
	Combined Method	14	27
In your company, what are the three major risk factors considered in risk-based auditing?	Adequacy of internal controls	33	63
	Financial materiality	35	67
	Complexity of operations	19	36
	Audit history	3	6
	Extent of changes, adjustments, or stability	11	21
	Liquidity of assets	28	54
	Competency of human resources	9	17
	Other	8	15

As seen in Table 1, most companies had fewer than 20 units under audit scope (55%), and the determination of audit responsibility was primarily based on independent decisions by the head of the audit department (29%) or the organization's strategic plans (27%). The review period for audit responsibilities varied, with 39% of companies reviewing their audit scope every three years or more. Regarding the method used for audit planning, 58% of companies employed a cycle-based approach, while 15% used a risk-based approach. The most significant risk

factors considered in risk-based auditing were the adequacy of internal controls (63%), financial materiality (67%), and liquidity of assets (54%).

Additionally, the study examined how companies allocate their annual internal audit programs. The responses indicated which areas of auditing receive the most attention, as shown in Table 2.

Table 2. Allocation of Annual Internal Audit Programs

Question	Response Options	Count	%
In your company, what is the primary focus of the internal audit annual program?	Operational auditing	7	13
	Compliance auditing	28	54
	Risk assessment	4	8
	IT auditing	0	0
	Financial auditing for general financial statements	23	44
	Special projects	8	15
	Fraud investigation	8	15

Table 2 illustrates that compliance auditing was the most common focus of internal audit programs (54%), followed by financial auditing for general financial statements (44%). Notably, none of the companies reported conducting IT auditing, indicating a potential gap in corporate risk assessment strategies. Operational auditing accounted for only 13% of the audit focus, while risk assessment was conducted in just 8% of companies.

In Table 3, several questions related to the planning of each audit engagement are presented. It is important to note that in most cases, respondents did not exclusively select risk management options; instead, they predominantly favored internal control-related options and combined approaches. The emphasis on internal controls was more prevalent among the surveyed companies, and heads of internal audit demonstrated a greater inclination towards reviewing internal controls. Additionally, responses to the first four questions in Table 3 were used to test the study's hypotheses.

Table 3. Planning of Each Audit Engagement

Question	Response Options	Count	%
In your company, what is the objective of each audit engagement?	Evaluating risk management practices in the business unit	6	12
	Evaluating the adequacy and effectiveness of the internal control system	24	46
	A combination of the above	22	42
In your company, for what purpose is the audit program designed?	Control activities	30	58
	Risk management activities	4	8
	A combination of the above	18	34
In your company, from which perspective is the audit reported to management?	Internal control	27	52
	Risk management	1	2
	A combination of the above	24	46
In your company, how is risk classified in management reports?	No classification	37	71
	1 to 5 risk categories	9	17
	6 to 10 risk categories	4	7
	More than 10 risk categories	2	5
In your company, which audit approach is primarily used for each audit engagement?	Risk-Based Approach	5	10
	Control-Based Approach	25	48
	Combined Approach	22	42

As observed in Table 3, the majority of respondents (46%) stated that the primary objective of audit engagements was to evaluate the adequacy and effectiveness of internal control systems, while only 12% focused on risk management. Similarly, 58% of audit programs were designed to test control activities, and only 8% were focused on risk management. The dominant approach to reporting audit findings was internal control (52%), while only 2% reported from a risk management perspective. Moreover, 71% of companies did not use any form of risk classification in their management reports. The most commonly used audit approach was the control-based approach (48%), while the risk-based approach was employed by only 10% of companies.

Table 4 presents the final set of research questions. A notable observation in this section is the non-responsiveness to certain questions. Some respondents lacked awareness of the nature of the questions in Table 4 and did not implement such practices, leading to missing responses. The frequency and percentage of missing responses are also presented in this table. Additionally, the third and fourth questions in Table 4 were used to test part of the study's hypotheses.

Table 4. The Role of Internal Audit in Compliance Risk Management

Question	Response Options	Count	%
Does your company implement compliance risk management?	Yes	3	6
	Implementation process is in progress	10	19
	No	39	75
If compliance risk management exists in your company, what role does internal audit play in its implementation?	Active role, supporting the initial implementation of enterprise risk management	17	32
	Other	27	52
	No response	8	16
What is the role of internal audit in compliance risk management in your company?	Suggests implementation when compliance risk management does not exist	6	12
	Plays a dynamic role and supports initial implementation	10	19
	Audits compliance risk management as part of the audit program	4	8
	Has continuous and dynamic participation in compliance risk management	3	6
	Manages and coordinates compliance risk management	1	2
	Does not intervene	18	34
	No response	10	20
Does your company have a risk management department?	Yes	10	19
	No	40	77
	No response	2	4
To what extent does the head of the internal audit department collaborate with the head of the risk management department?	The same person holds both positions	7	13
	Never	7	13
	Rarely	8	15
	Regularly	3	6
	Often	2	4
	Frequently	2	4
	No response	23	45

As presented in Table 4, 75% of respondents indicated that their company does not implement compliance risk management, while only 6% reported that such a system is in place. Among companies that have compliance risk management, the role of internal audit in its implementation was unclear, with 52% selecting "other" as their

response. When assessing the specific role of internal audit in compliance risk management, 34% of respondents stated that internal auditors did not intervene, while only 6% reported continuous participation. Additionally, 77% of companies did not have a dedicated risk management department, and 45% of respondents did not answer the question regarding collaboration between internal audit and risk management.

Following the descriptive statistical analysis of the observations, the study hypotheses were tested. It should be noted that the chi-square test was used to evaluate the hypotheses. The chi-square test is one of the most important non-parametric statistical tests, which examines whether the observed frequencies in a research design significantly differ from expected frequencies. This test determines whether there is a meaningful association between two variables or whether any observed differences are merely due to chance. In essence, the chi-square test helps assess whether there is a relationship between two variables or if they are independent of each other.

Two important points must be noted. First, to identify the application of risk-based techniques, companies using a combined approach were also considered as users (positive response). Additionally, non-responses were categorized as non-application of the respective technique (negative response), based on respondents' explanations.

The number of positive and negative responses regarding the studied questions, which were used to test the research hypotheses, are presented in Tables 5, 6, 7, and 8. Table 5 shows the distribution of positive and negative responses across small, medium, and large companies.

Table 5. Testing the First Four Research Hypotheses

Hypothesis	Small	Medium	Large	Total
H1: Application of risk-based internal auditing in annual audit planning	Yes: 6, No: 14	Yes: 9, No: 7	Yes: 9, No: 7	Yes: 22, No: 30
H2: Purpose of auditing – Evaluating risk management in business units	Yes: 9, No: 11	Yes: 9, No: 7	Yes: 10, No: 6	Yes: 28, No: 24
Audit planning is designed to test management activities	Yes: 8, No: 12	Yes: 3, No: 13	Yes: 11, No: 5	Yes: 22, No: 30
Auditing is reported to management from a risk management perspective	Yes: 7, No: 13	Yes: 7, No: 9	Yes: 11, No: 5	Yes: 25, No: 27
Use of risk classifications in audit reports	Yes: 3, No: 17	Yes: 3, No: 13	Yes: 9, No: 7	Yes: 15, No: 37
H3: A dynamic role in implementing operational risk management	Yes: 7, No: 13	Yes: 4, No: 12	Yes: 6, No: 10	Yes: 17, No: 35
H4: Continuous and dynamic participation in operational risk management	Yes: 3, No: 17	Yes: 0, No: 16	Yes: 0, No: 16	Yes: 3, No: 49

Chi-Square Test Results:

- H1: $\chi^2 = 1.838$; df = 2; Asymp. Sig = 0.399
- H2: $\chi^2 = 0.53$; df = 2; Asymp. Sig = 0.767
- Audit planning to test management activities: $\chi^2 = 4.768$; df = 2; Asymp. Sig = 0.092
- Reporting from a risk management perspective: $\chi^2 = 2.196$; df = 2; Asymp. Sig = 0.334
- Use of risk classifications in audit reports: $\chi^2 = 6.06$; df = 2; Asymp. Sig = 0.048
- H3: $\chi^2 = 0.435$; df = 2; Asymp. Sig = 0.804
- H4: Chi-square test could not be conducted due to lack of positive responses

Based on the presented data, only the use of risk classifications in audit reports showed a significant difference, with greater adoption in large companies compared to small and medium-sized ones. Consequently, part of Hypothesis 2 is confirmed, while Hypotheses 1, 3, and 4, along with the other components of Hypothesis 2, are rejected. Overall, Hypothesis 2 is also rejected.

Regarding Hypothesis 4, due to the absence of positive responses in medium and large companies, the hypothesis test could not be conducted. Only three small companies demonstrated dynamic participation of internal auditors in compliance risk management.

Table 6 presents the distribution of positive and negative responses across financial and non-financial companies.

Table 6. Testing the Second Set of Research Hypotheses

Hypothesis	Financial	Non-Financial	Total
H5: Application of risk-based internal auditing in annual audit planning	Yes: 11, No: 1	Yes: 11, No: 29	Yes: 22, No: 30
H6: Purpose of auditing – Evaluating risk management in business units	Yes: 12, No: 0	Yes: 16, No: 24	Yes: 28, No: 24
Audit planning is designed to test management activities	Yes: 10, No: 2	Yes: 12, No: 28	Yes: 22, No: 30
Auditing is reported to management from a risk management perspective	Yes: 11, No: 1	Yes: 14, No: 26	Yes: 25, No: 27
Use of risk classifications in audit reports	Yes: 9, No: 3	Yes: 6, No: 34	Yes: 15, No: 37
H7: A dynamic role in implementing enterprise risk management	Yes: 7, No: 5	Yes: 10, No: 30	Yes: 17, No: 35
H8: Continuous and dynamic participation in enterprise risk management	Yes: 0, No: 12	Yes: 3, No: 37	Yes: 3, No: 49

Chi-Square Test Results:

- H5: $\chi^2 = 10.976$; df = 1; Asymp. Sig = 0.001
- H6: $\chi^2 = 7.908$; df = 1; Asymp. Sig = 0.005
- Audit planning to test management activities: $\chi^2 = 7.789$; df = 1; Asymp. Sig = 0.005
- Reporting from a risk management perspective: $\chi^2 = 7.823$; df = 1; Asymp. Sig = 0.005
- Use of risk classifications in audit reports: $\chi^2 = 13.571$; df = 1; Asymp. Sig = 0.000
- H7: $\chi^2 = 4.086$; df = 1; Asymp. Sig = 0.043
- H8: Chi-square test could not be conducted due to lack of positive responses

Based on the results, Hypotheses 5, 6, and 7 are confirmed. However, for Hypothesis 8, due to the absence of positive responses in financial companies, the hypothesis test could not be conducted. Only three non-financial companies reported dynamic participation of internal auditors in compliance risk management.

Table 7 presents the distribution of positive and negative responses among private and non-private companies.

Table 7. Testing the Third Set of Research Hypotheses

Hypothesis	Private	Non-Private	Total
H9: Application of risk-based internal auditing in annual audit planning	Yes: 17, No: 16	Yes: 5, No: 14	Yes: 22, No: 30
H10: Purpose of auditing – Evaluating risk management in business units	Yes: 17, No: 16	Yes: 11, No: 8	Yes: 28, No: 24
Audit planning is designed to test management activities	Yes: 15, No: 18	Yes: 7, No: 12	Yes: 22, No: 30
Auditing is reported to management from a risk management perspective	Yes: 19, No: 14	Yes: 6, No: 13	Yes: 25, No: 27
Use of risk classifications in audit reports	Yes: 9, No: 24	Yes: 6, No: 13	Yes: 15, No: 37
H11: A dynamic role in implementing compliance risk management	Yes: 9, No: 24	Yes: 8, No: 11	Yes: 17, No: 35
H12: Continuous and dynamic participation in compliance risk management	Yes: 3, No: 30	Yes: 0, No: 19	Yes: 3, No: 49

Chi-Square Test Results:

- H9: $\chi^2 = 1.374$; df = 1; Asymp. Sig = 0.241
- H10: $\chi^2 = 0.27$; df = 1; Asymp. Sig = 0.603
- Audit planning to test management activities: $\chi^2 = 0.076$; df = 1; Asymp. Sig = 0.783
- Reporting from a risk management perspective: $\chi^2 = 1.245$; df = 1; Asymp. Sig = 0.265
- Use of risk classifications in audit reports: $\chi^2 = 0.192$; df = 1; Asymp. Sig = 0.661
- H11: $\chi^2 = 1.163$; df = 1; Asymp. Sig = 0.281
- H12: Chi-square test could not be conducted due to lack of positive responses

Based on the provided values, Hypotheses 9 and 10 are rejected, while Hypothesis 11 is confirmed. Regarding Hypothesis 12, due to the absence of positive responses in non-private companies, the hypothesis test could not be conducted. Only three private companies reported dynamic participation of internal auditors in compliance risk management.

Table 8. Results of Hypothesis 13 Testing

Evaluated Effectiveness Variables	Groups	Sample Size	Mean Ranks	Sum of Ranks	Mann-Whitney Test	Wilcoxon Test	Z Statistic	P-value
Specified confidence level (var1)	Group 1	10	5.7	57	2	57	-3.234	0.000
	Group 2	7	13.71	96				
Specified materiality level (var2)	Group 1	10	5.5	55	0	55	-3.452	0.000
	Group 2	7	14	98				
Budget based on standards (var3)	Group 1	10	45.5	55	0	55	-3.424	0.000
	Group 2	7	14	98				

For Hypothesis 13, the application of risk-based auditing in operational audits was tested for its impact on audit effectiveness. Three evaluation indices were defined: the specified confidence level in operational auditing, the specified materiality level in operational auditing, and achieving a budget based on standards. The analysis was conducted using a qualitative Likert scale approach, as the available indices (materiality level, confidence level, and audit budget) were also present in operational audit projects not utilizing a risk-based model.

Table 8 presents the results of the statistical tests. The significant p-values ($p < 0.05$) indicate that the implementation of a risk-based audit model leads to increased audit effectiveness in operational auditing.

Table 9. Results of Hypothesis 14 Testing

Evaluated Efficiency Variables	Groups	Sample Size	Mean Ranks	Sum of Ranks	Mann-Whitney Test	Wilcoxon Test	Z Statistic	P-value
Number of recommendations / actual hours (var1)	Group 1	10	8.4	84	29	84	-0.586	0.601
	Group 2	7	9.86	69				
Number of recommendations / actual cost (var2)	Group 1	10	7.7	77	22	77	1.269	0.230
	Group 2	7	10.86	76				
Number of weaknesses / actual hours (var3)	Group 1	10	45.5	55	24	79	-1.073	0.315
	Group 2	7	14	98				
Number of weaknesses / number of human resources (var4)	Group 1	10	5.5	55	0	55	-3.416	0.000
	Group 2	7	14	68				
Number of recommendations / number of human resources (var5)	Group 1	10	6.1	61	6	61	-2.832	0.003

For Hypothesis 14, the application of a risk-based auditing model in operational auditing was tested for its impact on audit efficiency. Five evaluation indices were defined:

1. Number of recommendations per actual hours
2. Number of recommendations per actual cost
3. Number of weaknesses per actual hours
4. Number of weaknesses per number of human resources
5. Number of recommendations per number of human resources

These efficiency indices were quantitatively measured through project files, audit documentation, and archival records.

According to Table 9, no significant differences ($p > 0.05$) were observed for the indices of recommendations per actual hours, recommendations per actual cost, and weaknesses per actual hours between the two groups of operational audit projects. Although the mean index values were higher in the second group of projects, due to sample size limitations, these differences were not statistically significant.

4. Discussion and Conclusion

Auditing plays a fundamental role in developing internal control methods for financial and non-financial aspects, establishing internal control systems, reviewing and evaluating these systems, providing constructive recommendations for improvement, and assessing the effectiveness and efficiency of resource utilization within an enterprise. It encompasses financial, managerial, and operational systems, along with special audits. The scope, methods, and responsibilities of internal auditing, as well as its reporting structure, must be clearly defined, with competent individuals or groups continuously evaluating its performance. Internal auditing significantly contributes to risk management by assisting management in identifying and assessing potential risks and determining organizational risk points. Moreover, internal auditors provide impartial and independent opinions on the effectiveness of risk response measures, key controls, and whether organizational risks have been mitigated to an acceptable level.

This study sought to identify the characteristics of companies utilizing risk-based internal auditing and to examine the role of internal auditors in corporate risk management processes. Sixteen hypotheses were developed, and the study analyzed small, medium, and large companies, as well as financial and non-financial, private and non-private, and listed and non-listed firms. The findings revealed that the adoption of a risk-based approach for annual audit planning is independent of company size, and there is no significant relationship between this approach and the planning of individual audit engagements. The presence of an active role for internal auditing in implementing compliance risk management is also independent of company size. Additionally, dynamic and continuous participation of internal auditing in corporate risk management was observed only three times, rendering further analysis infeasible.

The study further confirmed that the number of companies using risk-based methods for annual audit planning is higher in the financial sector than in non-financial sectors, as is the number of companies employing risk-based methods for individual audit engagements. The role of internal auditing in implementing compliance risk management is also more pronounced in financial institutions than in non-financial entities. These findings align with prior research [8, 25-32].

The analysis of private and non-private companies showed that the risk-based approach for annual audit planning is not significantly related to an organization's private status, and its application in planning individual audit engagements is independent of whether a company is private or not. This contradicts the findings of Goodwin (2004) and Castanheira (2009) [32, 33]. Additionally, the active role of internal auditing in implementing compliance

risk management does not depend on a company's private or non-private status. The study also revealed that membership in the stock exchange does not influence the adoption of a risk-based approach for annual audit planning or individual audit engagements. Furthermore, listing status has no effect on the active role of internal auditing in compliance risk management. The dynamic and continuous participation of internal auditing in corporate risk management was again observed only three times, preventing further evaluation. These conclusions are consistent with the findings of Castanheira et al. (2009) [32].

Overall, the study demonstrated that the adoption of risk-based internal auditing in financial institutions differs significantly from its implementation in other economic sectors. Internal auditors in financial entities show greater involvement in implementing compliance risk management than their counterparts in non-financial firms.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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