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Internal Audit and Risk Management in Commercial Banks Listed on the Amman Stock Exchange in Light of the COVID-19 Pandemic

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Abstract: Risk management is frequently cited as one of the most important focuses for executives working in the financial industry. As a result, a great number of books and articles on risk management have been written. Regarding keeping track of a company's risk profile and identifying opportunities to improve risk management practices, the importance of internal auditing in today's rapidly evolving business climate cannot be underestimated. During the COVID-19 pandemic, this study investigated the impact of internal auditing and risk management on commercial banks listed on the Amman Stock Exchange. Only 198 of the 315 questionnaires that were sent out through email to various financial managers and accountants could be considered legitimate for the study. In addition, the data were evaluated using partial least square structural equation modeling (PLS-SEM). The findings indicated that an internal audit, an internal auditor, and the additional value of an internal audit are statistically substantially associated with risk management. This finding is consistent with the theory and our expectations. On the basis of these findings, the study recommended that more attention be paid to internal audit because of its importance in supporting the function of risk management through relevant specialized training courses and the provision of support to internal audit management in terms of trained and qualified human resources, both academically and practically, particularly during the COVID-19 pandemic. This recommendation was made because of the importance of internal audit in supporting the function of risk management through relevant specialized training courses.

Keywords: commercial banks, COVID-19 pandemic, partial least square structural equation modeling, risk management.

鉴于新冠肺炎大流行，安曼证券交易所上市商业银行的内部审计和风险管理

摘要：风险管理经常被认为是金融行业高管最重要的关注点之一。因此，出现了大量有关风险管理的书籍和文章。在跟踪公司的风险状况并寻找改进风险管理实践的机会方面，内部审计在当今快速变化的商业环境中的重要性不容低估。在新冠肺炎大流行期间，本研究调查了内部审计和风险管理对安曼证券交易所上市商业银行的影响。通过电子邮件发送给各财务经理和会计师的315份调查问卷中，只有198份可以被视为该研究的合法性。此外，还使用偏最小二乘结构方程模型（偏最小二乘扫描电镜）对数据进行了评估。研究结果表明，内部

审计、内部审计师以及内部审计的附加价值在统计上与风险管理密切相关。这一发现与理论和我们的预期一致。基于这些发现，该研究建议更加重视内部审计，因为它通过相关的专门培训课程支持风险管理职能，并通过训练有素的合格人员为内部审计管理提供支持。学术和实践方面的资源，特别是在新冠肺炎大流行期间。提出这一建议是因为内部审计在通过相关专业培训课程支持风险管理职能方面的重要性。

关键词：商业银行、新冠肺炎大流行、偏最小二乘结构方程模型、风险管理。

1. Introduction

Since quite some time ago, risk information has been a crucial component of the auditing process, as it should have been all along. Therefore, internal audit departments are now responsible for conducting their own risk assessments. This may be because there is not yet an established function for enterprise risk management, or it may be a way for them to demonstrate that they are independent [1]. Audits of risk management frameworks need to be carried out by internal audit to reassure boards of directors and top management that such frameworks are sufficient and efficient. It is difficult to have a single individual who is responsible for both internal auditing and risk management. This individual would then presumably submit reports on both areas and act as a representative for both to the board or a board audit and risk committee. Having a single individual with dual responsibilities is difficult. Although they are required to collaborate, internal audit and risk management are required to report to separate senior managers because we believe it is vital for clear governance objectives and to ensure that neither position is jeopardized by the other [2]. It is possible that Chief Risk Officers, who are responsible for monitoring all aspects of internal audits, risk management, and compliance, will find this challenging to implement in practice. Internal audit and risk management should be kept distinct for a variety of reasons, including those outlined above relating to governance and management and culture in general [3]. Line managers are ultimately responsible for accomplishing the company goals, and it is their responsibility to monitor risk management for the divisions for which they are responsible. When risk management is housed in a central, compliance-related area rather than in a line, it can send confusing signals to the business. It is best to have internal audit and risk management on two separate teams, with the former taking care of the organization's overall risk management structure, process, and database and the latter reporting directly to the top brass. Internal audit and risk management should both be reported to the top brass [4]. When this occurs, the risk management department has the opportunity to act as a mentor and consultant to senior management. Although isolation is

of the utmost importance, it is crucial that the process of internal audit obtain pertinent data from the process of risk management to allow the construction of assurance plans and schedules, such as the Internal Audit Plan [5]. The risk register of a company should contain information regarding the risks it is exposed to, the controls it has implemented to mitigate those risks, management's evaluation of the effectiveness of those controls, the consequences and likelihoods of each risk occurring given the current state of the controls, and the potential exposure the company might face should the controls fail completely [6]. The Department of Internal Auditing is interested in risk treatment plans because these plans reflect management's intent to address prevalent risks. They need to verify the correctness of the processes utilized in the activities that match the plans and keep track of the pace at which those activities are carried out [7]. Internal audits are concerned not only with the quality and effectiveness of line management's review of controls and risks but also with the application of procedures such as control self-assessment. The government is keeping a close eye on businesses to identify any potential dangers to their operations [8]. Consequently, boards of directors want evidence that the organization maintains a sound risk culture and that risks are being appropriately managed. In addition, the financial crisis and a spate of scandals in other industries have made risk management a critical approach for lowering the total risk that firms face. This was the case because risk management is a crucial method for lowering overall risk [9]. Enterprise risk management is a novel approach that is becoming increasingly popular for dealing with the myriad of challenges that contemporary firms face [10]. As a consequence of this, the relevance of effective risk management has come to be increasingly recognized as it has an effect not only on the profitability of the firm but also on its continued existence in the long term [11]. In the meantime, businesses over the past few years have been forced to rapidly adapt to survive the increasing economic complexity, tighter legal restraints, and new kinds of technology [12]. An internal audit now provides new opportunities as a result of these adjustments. In this particular context, the contributions

of the assurance and consulting responsibilities of internal auditing to the successful management of risk are mutually reinforcing. The major responsibility of an internal audit is to supply the board with independent assurance of how well risk is being managed [13]. The preceding discussion makes it abundantly evident that the significance of internal auditing and the benefits that it can deliver to modern firms requires a greater degree of awareness [14]. In addition, most research conducted up to this point has focused on preventive strategies [15, 16]. To the best of our knowledge, there has not been any previous empirical research carried out on the role that internal auditing plays in risk management within the context of Jordan. Within the scope of this study, we investigate in great detail how internal audit, the perceived value of internal audit, and the existing function of internal auditors in risk management are all seen within Jordan's particular environment. In light of the aforementioned research techniques, the investigation shed light on the linkages between internal audit and risk management. In spite of the difficulties that Jordan had to face ahead of the coronavirus pandemic as a direct consequence of existing circumstances, the country was able to deal with the pandemic in a way that did not influence the performance of the banking sector, and the banking sector was able to activate precautionary plans to deal with the knock-on effects of the pandemic. In other words, Jordan could deal with the pandemic in a way that did not affect the company's performance. This is because internal audit plays such a key role in delivering timely advice to risk management and keeping a close check on matters overall. Parallel to the development of the coronavirus, Jordan's banking industry has recently evolved to rely more and more on internal audits as the fail-safe. This is because bank management has a very high regard for it, and the company's auditors are steadfast in their commitment to maintaining a rigorous collection of qualified benchmarks.

2. Literature Review

Internal auditing has developed over the course of time because of the profession's need to accommodate the ever-shifting nature of society and demands placed on business management [17]. According to the definition provided by the Institute of Internal Auditors, an internal audit is an independent evaluation function established within an organization to investigate and analyze its actions as a service to the organization [18]. At the same time, the advancement of information technology has produced new dangers for enterprises [1]. [19] studied a risk-based method for conducting an internal audit in this setting. This technique has developed over time [20]. According to the definition provided by the Institute of Internal Auditors, an internal audit is an independent evaluation function established within an organization to

investigate and analyze its actions as a service to the organization [21]. At the same time, the advancement of information technology has spawned new kinds of dangers for enterprises [22]. In this context, [23] investigated a risk-based approach to an internal audit. According to the findings of their investigation, internal audits can either follow a risk-based strategy or a procedure-based one. According to the findings of the researchers, the efforts of the internal audit are focused on the regions that present a relatively higher risk in accordance with a risk-driven strategy. [24] investigated the use of internal auditing practices in Australian organizations. The findings suggest that better risk management techniques can be achieved through the implementation of internal auditing procedures. An international perspective of the operational risk management framework from the point of view of internal audit was offered by [13] within the same time span. The author highlights the significance of internal audit in operational risk management by explaining the growing role of the internal audit function within the context of risk management. This serves to illustrate the significance of internal audits in operational risk management. [25] investigated risk-based internal audits performed in Jordanian financial institutions. According to the research conducted, financial institutions in Jordan establish risk-based audit procedures; nevertheless, most these institutions do not properly document their risk assessments. Within this time frame, the Institute of Internal Auditors conducts an analysis of the function of internal auditing within the framework of enterprise-wide risk management [26]. According to the findings, the primary responsibilities of internal audit in the field of risk management are as follows: providing assurance on the processes of risk management, ensuring that risks are correctly evaluated, evaluating risk management processes, evaluating the reporting of key risks, and reviewing the management of key risks. According to [27], conducting an internal audit is critical for a successful firm today. The authors of the study concluded that, in today's environment of increased business risks, effective internal auditing requires not only the ability to anticipate future dangers but also the ability to recognize emerging trends in the control sector. The research also indicates that the achievement of a company's aims may be reliant on the degree to which its internal audit department and its audit committee collaborate to keep an eye on potential dangers. Conventional methods of conducting internal audits consist solely of examining a company's actions to determine whether or not they conform to predetermined standards. However, in the modern era, value-added audits are widely recognized and generally considered a regular component of any internal audit. According to [28], value-added approaches, such as those provided by internal audits, assist firms in achieving their objectives and improve the quality of

the data utilized in decision-making. Over sixty percent of European business leaders interviewed by [24] stated that they were confident in the value added by their organization's risk management and internal control systems. [29] investigated the value-added function of more contemporary internal audits. According to the findings of this study, one of the most important factors in evaluating the features of an internal audit department that delivers value to a business is the degree of risk that a firm is exposed to. A research project on internal auditing was conducted by the Institute of Internal Auditors at approximately the same time. According to the findings, one of the most important factors for determining the added value that internal auditing contributes to a company is the ability to provide objective assurance that the firm's internal control framework is operating as intended. When evaluating potential threats to an organization, it is in everyone's best interest for the company's internal auditors to take both a holistic and a targeted approach [30]. [26] investigated the most effective methods and tools that may improve the effectiveness of internal audit, in addition to the best structure and function of internal audit. Their research indicates that there should be a closer working relationship between risk management and internal audit. In addition, they demonstrated that skilled internal auditors are crucial to any successful internal auditing process. This conclusion can be drawn from the data. Recently, [31] highlighted the need to have both the necessary knowledge and experience for internal auditing. [32] compared the opinions of internal auditors on their role in risk management. They discovered that internal auditors are essential for establishing a more stringent risk management framework. [33] provided an overview of the current situation of internal auditing across five Asian and Pacific economies. The findings provide further evidence that internal auditors in the nations listed above make rational use of the standards. The influence that internal auditors have on the risk management of businesses is another topic that [2] investigated. When the relationship between internal auditors and the audit committee is positive, the results reveal no correlation between the level of risk management engagement and the willingness of internal auditors to report to the audit committee. Last but not least, [6] looked into the risk management strategies used by internal auditors working in Jordanian financial institutions. There are several categories of potential dangers presented here, along with the responses that an internal auditor might have to each one. According to the findings, Jordan's internal auditors are most concerned about potential dangers to the country's economy and way of life. [34] conducted a survey of chief audit executives and senior audit leaders in North America and found that the effects of COVID-19 on the revenue of affected industries were 61%. Human resources and supply

chains were also found to feel the effects of the risk. As a direct consequence of this, numerous industries have modified their production costs to reflect the impact of the epidemic on their human resources. This enables them to better protect their workforce while also increasing their productivity. According to their results, this presents an once-in-a-lifetime opportunity to both improve risk management and enhance best practices for internal auditing while the audit plan is being developed. Nevertheless, [29] revealed that the audit plan's strategies have evolved, notably regarding digital transformation, in anticipation of the coronavirus pandemic and that priorities would need to be readjusted because of these findings. On the other hand, regarding risk management, an internal audit is expected to assist, advise, and reevaluate on an annual basis, reorganize priorities, and provide a report to audit committees or management, which may then study the problem and come up with appropriate solutions. According to the global knowledge summary published by the Chartered Institute of Internal Auditors in May 2020, the coronavirus pandemic presents an excellent opportunity for internal auditors to showcase their skills. Practitioners of the profession are being hailed as heroes for their efforts to manage the crisis. Internal auditing is an excellent opportunity for the profession to showcase its skills. In addition, the article recommends that the phrase "now is the time to act, not to say" be spoken out loud and that the industry experts strive to improve their abilities by participating in debates, seminars, and other types of professional development opportunities. Throughout today's world of governance, internal auditing is more vital than ever. An article (2020) supervised by a consultant at the Chartered Institute of Internal Auditors named Liz Sanwith argued that internal audits add significant value to businesses by providing consultancy and vision supported by data to aid in making decisions related to goal attainment and risk reduction, identifying and reporting fraud, and fostering a culture of continuous improvement. In addition, it assists in focusing on future hazards while simultaneously reducing present risks, which influences future audit plans for 2020–2021 and changes the approach taken by the internal audit department to provide greater value to smaller-scale firms. Because we need an uncomplicated method and because risks are constantly shifting, we might switch to conducting audits remotely instead of using the more traditional approach. Auditors have been given new difficult jobs because of unanticipated dangers caused by the coronavirus pandemic. However, these challenges can be overcome with the appropriate combination of experience, training, forum participation, debate, dialog, and teamwork while auditors are on the job, being conscious of the fact that, in addition to being dependable information sources, they themselves are resources. It is evident that the dangers are currently

shifting and will continue to do so as a direct effect of this pandemic. However, researchers do not yet know the entire impact that the coronavirus pandemic will have, nor do they know how much influence it will have. Therefore, we need to explore what techniques are most suitable for the nature of the pandemic at this moment, and we also need to consider the advancement of technology and the consequences it will have in the future. [24] described the three-dimensional model, which is also known as the "three lines of defense." This model is based on six guiding principles, governance, duties of the ruling authority, roles of the first- and second-line management, functions of the third line, independence of the third line, value generation and preservation, and other related concepts. The objective of the audit is to contribute to risk management and educate stakeholders on how to confront non-traditional threats. In addition, the researcher referred to the model to support the thesis that risk-based decision-making cannot occur if the auditor is not included in the process of deliberation.

This was done to show that the contention had some merits. The model's emphasis on open lines of communication and working together paid off when it came to dealing with potential threats, and the sixth principle, which was to develop value, was met with a cooperative effort of the participants. The success of the concept can also be attributed to its emphasis on open communication channels and working together.

3. Conceptual Framework

In this study, the research framework is represented diagrammatically through an analysis of the connections between different research structures and the sequence in which their effects occur. We can see an example of this in Fig. 1. There is a direct causal link between internal audit, internal auditors, and internal audit added value, which triggers the first flow of control, which is risk management. The current investigation extends the conceptual framework by including Board Members and External Auditors as control variables.

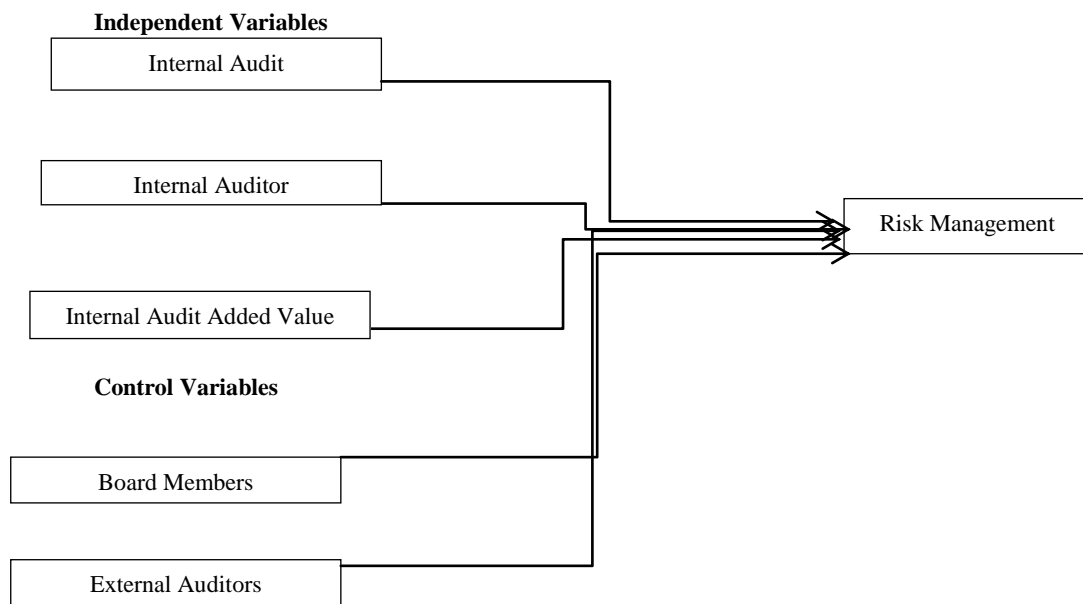


Fig. 1 Research framework

4. Methodology

In this investigation, strategies from quantitative descriptive research methodology were used as methodological frameworks. According to the report prepared by the ASE for 2021, the population under investigation also consists of financial managers and accountants from commercial banks listed on the Amman Stock Exchange. Because the population of the study did not contain a particularly large number of financial institutions, we had little choice but to include each of them in our sample. A questionnaire was distributed to corporate managers, accountants, and internal auditors of Jordanian companies. These individuals are responsible for conducting internal audits. This is the method used to collect the data. Because the objective was to collect data for use in

statistics, it was necessary to use closed questions, which meant that respondents could not interpret the questions in more than one manner. Participants were sent many emails over the course of the next year, beginning in September 2020 and continuing through June 2021, to complete the data gathering procedure. Consequently, a response rate of 62.9% was achieved, and 198 valid responses were acquired out of 315 surveys that were mailed out. The respondents were provided with a Likert scale that ranged from 1 (strongly disagree) to 10 (strongly agree), on which they were instructed to rate the degree to which they agreed or disagreed with each of the items. Our group of independent variables comprises the phrases "added value," "internal audit," and "internal auditor." To develop a suitable measure of "internal audit," we

incorporate five aspects related to internal audit objectives, internal audit use in routine and emergency situations, and internal audit cooperation with the audit committee with regard to risk management. All of these aspects are related to internal auditing. The "added value of internal audit" and the Institute of Internal Auditors will be evaluated on the basis of these five criteria that we decided upon. The efficiency of the internal control system, the accuracy of the information used in decision-making, and the value added by the internal audit were all put to good use. Six criteria were used in the evaluation of the "internal auditor." In addition, the data from the questionnaire were evaluated using partial least squares structural equation modeling (PLS-SEM). The researchers used a data mining strategy before performing the actual data analysis to ensure that the data are presented comprehensively and correctly. In addition, SmartPLS 4.0 was used to analyze the data and verify the dependability of the model. Using PLS-SEM can be justified for various reasons, depending on the context. The purpose of this research is to investigate the possible connections between various recognized components. On the other hand, the PLS-SEM method is used in this inquiry to analyze the survey outcomes. PLS-SEM is a statistical tool for studying and assessing causal linkages within the context of existing empirical evidence and a researcher's own prior assumptions in the study area. The SEM approach blends more conventional types of empirical research with more recent types of degeneration. To perform more granular analysis, the SEM might be divided in half. The estimating model establishes a connection between the observed events and fixed variables. This is the fundamental model to use if there are related passive variables. In addition, the reflective-reflective Type I model will be used throughout this investigation. Lower-order structures are computed using the reflective method; although they can be untangled from one another, they are still components of a greater total. A model of organizational latent variables, such as the "organizational common factor model," is the best choice if the goal of the study is to find the common factor among many reflective constructs that are related but differ in the quality of their reflections.

5. Findings of the Study

198 responses were considered valid for the survey. As a direct consequence of this, the research focused on this specific number. The information obtained from the structural equation model was used in the process of compiling the results presented here. When people do not answer parts of the survey questions, it can lead to missing information. To rule out the potential of missing data, a frequency analysis and an analysis of missing values were performed on each measurement object in this study. The screening of the data indicated a modest amount of information that was absent;

hence, the median variable responses were used to complete the missing data for each measurement item. Observations that stand out for having an abnormally high or low value for a single variable are known as outliers [35]. To guarantee that we were divulging all the pertinent information about each unit of interest, in addition to analyzing histograms and box plots, we calculated standard deviations for each variable. According to [36], an outlier case has a standard score greater than or equal to 4.0. To accomplish this, we consider a Z-score an outlier if it is either higher than 4 or lower than -4.

5.1. Measurement Model

Analyzing the total reliability values as part of the procedure for determining the internal consistency was selected as the method of choice for performing the reliability study. According to Table 1, all the variables showed that they may be relied on for constructing composites (values greater than 0.7) [37]. As the clarification implies, the indicators were maintained even if it was established that the reliability of the indicators (squaring of external loadings) was less than 0.7; however, it was determined that the composite reliability and AVE are adequate for measurement [38]. We assessed the convergent validity of the AVE values to determine whether they were higher than 0.5 (Table 1), and we used the Fornell-Larcker test to determine whether or not the discriminant validity of the values was adequate (Table 2). To satisfy the criteria of discriminant validity, the square root of AVE must be higher than the correlation between latent variables for each latent variable. As shown in Table 2, the criteria for discriminant validity are satisfied by the variables in question. If the HTMT value was greater than 0.90, the discriminant validity was doubtful [37]. Because every single HTMT score in this set fell much below the threshold value of 0.90, there was no reason to be concerned about the discriminant validity of the results (Table 3).

Table 1 Measurement model

Variables	Loading	CA	CR	AVE
Risk Management		0.917	0.936	0.708
RM1	Deleted			
RM2	0.811			
RM3	0.832			
RM4	0.869			
RM5	0.873			
RM6	0.853			
RM7	0.807			
Internal Audit		0.896	0.826	0.613
IA1	Deleted			
IA2	0.770			
IA3	0.796			
IA4	0.783			
IA5	Deleted			
Internal Auditors		0.885	0.908	0.624
IAs1	0.784			
IAs2	0.848			
IAs3	0.784			
IAs4	0.789			
IAs5	0.818			
IAs6	0.708			

Continuation of Table 1							
Internal Audit Added Value		0.874	0.914	0.726	BM3	0.78	
IAAV1	0.789				BM4	0.832	
IAAV2	0.890				External Auditors		0.914 0.936 0.744
IAAV3	0.894				EA1	0.853	
IAAV4	0.831				EA2	0.885	
Board Members		0.821	0.868	0.623	EA3	0.881	
BM1	0.775				EA4	0.843	
BM2	0.767				EA5	0.85	

Table 2 Discriminant validity with the Fornell-Larcker criterion

	Board Members	External Auditors	Internal Audit	Internal Audit Added Value	Internal Auditors	Risk Management
Board Members	0.789					
External Auditors	0.581	0.863				
Internal Audit	0.553	0.476	0.783			
Internal Audit Added Value	0.542	0.626	0.561	0.852		
Internal Auditors	0.686	0.677	0.584	0.681	0.790	
Risk Management	0.544	0.526	0.618	0.776	0.533	0.841

Table 3 Heterotrait and monotrait validity

	Board Members	External Auditors	Internal Audit	Internal Audit Added Value	Internal Auditors	Risk Management
Board Members						
External Auditors	0.727					
Internal Audit	0.658	0.601				
Internal Audit Added Value	0.809	0.707	0.727			
Internal Auditors	0.731	0.760	0.718	0.728		
Risk Management	0.721	0.570	0.776	0.760	0.724	

5.2. Common Method Bias

To establish the influence of CMB in this experiment, both the common latent factor (CLF) analysis and the single factor analysis developed by

Harman were applied [39]. Because the first variable explained less than half of the total variance, the results of Harman's one-factor test did not indicate a CMV issue.

Table 4 Harman's one-factor CMV assessment

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	18.402	48.426	48.426	18.402	48.426	48.426
2	2.967	7.808	56.234	2.967	7.808	56.234
3	1.996	5.252	61.486	1.996	5.252	61.486
4	1.376	3.622	65.109	1.376	3.622	65.109
5	1.109	2.919	68.028	1.109	2.919	68.028

5.3. Goodness of Fit (GoF)

Considering that PLS-SEM does not provide complete GoF indices, the R² value is typically used to evaluate the model's capacity to explain observed data [40]. With a value of 0.731 for its goodness-of-fit, the proposed theoretical model from this research was found to have significant predictive and explanatory potential.

$$GoF = \sqrt{AVE \times R^2} = \sqrt{0.656 \times 0.765} = \sqrt{0.535} = 0.731$$

5.4. Results of the Structural Model Analysis

Because PLS is a non-parametric analysis, it does not presume that the data will have a normal distribution. Therefore, there is a chance that the t-values will be manipulated in such a way that they would be intentionally inflated or deflated, which would result in a type I error. As a result, [41] created a method known as bootstrapping. The bootstrapping approach takes many subsamples (1000) from the

original sample and replaces some of the data in each one. This allows the t-values to be estimated for significance testing of the structural route. Establishing a theoretical research framework or model-based schematic diagram is necessary before using SmartPLS structural equation modeling. The visualization tool SmartPLS 4.0 was also used during the analysis. Fig. 2 displays the relationships between the independent variables, modified variables, and dependent variable. The factor loadings for each item are depicted in Fig. 2, which is a standardized estimate of the structural model utilized in this investigation.

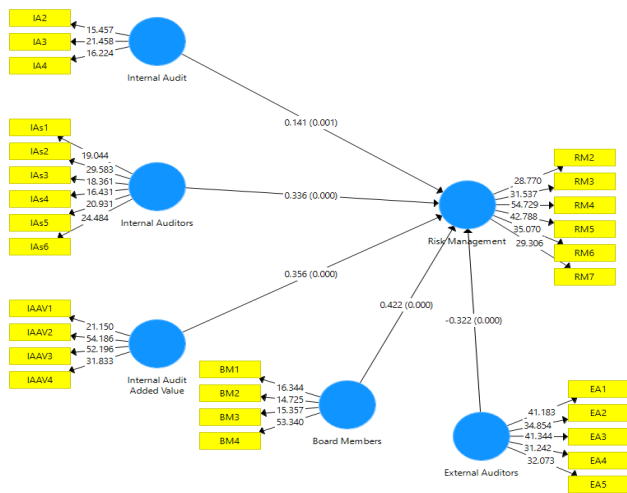


Fig. 2 SmartPLS standardized results

The findings compiled from the SmartPLS structural equation model (SmartPLS SEM) utilized in the research are summarized in Table 5. As a direct result of the various constructs used in this study, it was demonstrated that the path coefficients, standard deviation, and probability value were substantially connected with one another (P-value). In addition, the findings of the internal audit and risk management revealed a significant positive link. It was discovered that the level of risk management practiced by Jordanian commercial banks during the COVID-19 epidemic rose by 0.141 percentage points for every one percentage point that was added to the level of internal audit. In addition, the findings showed that internal auditors had a significant positive impact on risk management. This is something that was proved by the

findings. According to the data, an improvement in risk management of 0.336% would be achieved if Jordanian commercial banks increased the number of internal auditors by just one percent during the COVID-19 outbreak. It was also shown that there is a statistically significant association between the value added by internal audits and risk management. According to the findings, during the COVID-19 pandemic, a one percent rise in internal audit added value would result in a 0.356% increase in risk management in Jordanian commercial banks. This was determined by examining the correlation between the two variables. The R2 value provides insight into the extent to which the independent variables may explain the total variation. There was variation in the dependent variable, which was represented by the independent variables. During the COVID-19 pandemic in Jordan, risk management in commercial banks predicted that 75.5% of the country's volatility could be accounted for by Table 6. To put it another way, the error variance of risk management is responsible for approximately 24.5% of the variation in risk management itself. Additionally, the f2 of all the external latent variables is considered as a size impact that carries a significant amount of weight in the analysis. The exogenous latent constructs in this inquiry all have poor predictive relevance, as do all the exogenous latent constructs (Q2). According to the findings of [42], the predictive relevance of an exogenous construct to an endogenous construct was moderate at values of 0.02, medium at values of 0.15, and considerable at values of 0.35.

Table 5 Summary of the path coefficients

	Beta Value	STDEV	T Statistics	P Values
Internal Audit -> Risk Management	0.141	0.044	3.185	0.001
Internal Auditors -> Risk Management	0.336	0.066	5.075	0.000
Internal Audit Added Value -> Risk Management	0.356	0.062	5.790	0.000
Control Variables				
Board Members -> Risk Management	0.422	0.075	5.645	0.000
External Auditors -> Risk Management	-0.322	0.065	4.963	0.000

Table 6 Coefficient of determination

	R ²	R ² Adjusted	f ²	Q ²
Risk Management	0.755	0.749	0.199	0.494

6. Conclusion

Over the last ten years, a significant amount of attention has been paid to the role that financial growth plays in fueling economic prosperity [1]. The volatility that characterizes the economy on a worldwide scale in the modern era has elevated risk management to the status of a pressing concern that demands attention [2]. However, in this post-crisis era, internal auditing has taken on increased strategic importance, although its focus has largely shifted from a more traditional assurance focus to a value-added one. This shift in focus is because internal auditing is now more concerned with adding value. Considering the COVID-

19 pandemic, the objective of this study was to analyze the internal audit and risk management practices employed by commercial banks listed on the Amman Stock Exchange. To begin, this study provides an in-depth analysis of the current situation regarding the relationship between risk management and internal auditing. The next thing that we discovered was that "risk management," "internal auditors," and "added value of internal audit" are all statistically associated with "internal audit," so verifying the research predictions that we had made. At the 5% level of significance, the finding can be considered reliable. Our findings led us to the conclusion that internal audit does have an impact on the effectiveness of risk management, which agrees with the findings of [43, 44]. This finding agrees with findings from [1, 2], and it provides more evidence for the value-added function

that internal audit plays in risk management at a considerable level of 5%. The results show that an internal auditor and risk management have a positive and significant correlation, which is consistent with the findings of [3] and [4], which show that this correlation exists. Because of several caveats, the findings of our research should be regarded with extreme caution. To begin with, there is some uncertainty regarding whether or not the results of a survey that is completed via mail will be credible. Second, the investigators have stated that they are aware of the possibility of additional factors being engaged in the connection between risk management and internal audit. The constraints of the present analysis have led to the suggestion of several possible future lines of inquiry and opportunities for additional work in this area. It is possible that research will investigate the ways in which other governance players, including board members and external auditors, view the connection between risk management and internal audit. In addition, it is recommended to conduct interviews to gain a more comprehensive picture of risk management. This will allow better informed decision-making. There is, without a shadow of a doubt, a demand for greater research in this field, as well as the possibility that such investigation could be beneficial. According to the findings, to advance the internal auditing profession in terms of internal auditor performance and audit methodologies, training programs and the concomitant advancements in communications, the Internet, and technology are required. This is the case despite the fact that internal auditors are already performing well. When there is talk about remote auditing without providing specific details about the mechanism of procedures and how to put them into practice or work with them, we need to be ready for any unexpected action that may come our way. Because the coronavirus pandemic has not yet been brought under control, this is of utmost significance. In addition, to decrease or eliminate risks, they need to be regularly analyzed, managed, and prioritized according to their priority and severity. Right now, is the time to determine precisely what must be done during the internal audit and how it will be done? Because internal audit does not participate in decision-making, it is necessary for all relevant units or departments to collaborate to reduce risks and advance the institution's objectives. Internal audit has taken on a more significant role because of the repercussions of the coronavirus pandemic. This function includes regulating, following up on, and adopting required procedures and decisions to combat risks.

References

[1] TAMIMI O. The role of internal audit in risk management from the perspective of risk managers in the banking sector. *Australasian Accounting, Business and Finance Journal*, 2021, 15(2): 114-129.

<http://dx.doi.org/10.14453/aabfj.v15i2.8>

[2] CHOWDHURY A., & SHIL N. C. Influence of new public management philosophy on risk management, fraud and corruption control and internal audit: evidence from an Australian public sector organization. *Journal of Accounting and Management Information Systems*, 2019, 18(4): 486-508. <https://online-cig.ase.ro/jcig/papers.aspx?idc=51930>

[3] XIAO L. Application of Internal Audit in Risk Management of Private Enterprises in Southwest China Taking Chongqing Binxin Group as an Example. *Proceedings of the 3rd International Conference on Judicial, Administrative and Humanitarian Problems of State Structures and Economic Subjects, Domodedovo*, 2018: 516-523. <https://doi.org/10.2991/jahp-18.2018.106>

[4] EULERICH M., KREMIN J., and WOOD D. A. Factors that influence the perceived use of the internal audit function's work by executive management and audit committee. *Advances in Accounting*, 2019, 45: 100410. <http://dx.doi.org/10.1016/j.adiac.2019.01.001>

[5] MEXMONOV S. U., & TEMIRKHANOVA M. J. The Role of the Internal Audit Based International Internal Audit Standards in Uzbekistan. *Scientific Research Archive*, 2020, 33(1): 1-5. <https://ejournal.tsue.uz/index.php/archive/article/view/3257>

[6] HAMSHARI Y. M. The Impact of Internal Audit on Improving Risk Management Pursuant to Internal Auditing Standards in Commercial Banks Listed on Amman Stock Exchange in Light of the Covid-19 Pandemic. *Journal of Positive School Psychology*, 2022, 6(7): 4739-4754. <https://journalppw.com/index.php/jpsp/article/view/12360>

[7] KOTB A., ELBARDAN H., and HALABI H. Mapping of internal audit research: a post-Enron structured literature review. *Accounting, Auditing & Accountability Journal*, 2020, 33(8): 1969-1996. <https://doi.org/10.1108/AAAJ-07-2018-3581>

[8] GAVRYS P. O., GAVRYS M. O., and GAVRYS O. M. Features of risk management and organization of internal audit at industrial enterprises. *Business Inform*, 2020, 9: 128-135. <https://doi.org/10.32983/2222-4459-2020-9-128-135>

[9] LENZ R., SARENS G., and JEPPESEN K. K. In search of a measure of effectiveness for internal audit functions: an institutional perspective. *EDPACS*, 2018, 58(2): 1-36. <https://doi.org/10.1080/07366981.2018.1511324>

[10] LARASATI D. A., RATRI M. C., NASIH M., and HARYMAWAN I. Independent audit committee, risk management committee, and audit fees. *Cogent Business & Management*, 2019, 6(1): 1707042. <http://dx.doi.org/10.1080/23311975.2019.1707042>

[11] SPIRA L. F., & PAGE M. Risk management: The reinvention of internal control and the changing role of internal audit. *Accounting, Auditing & Accountability Journal*, 2003, 16(4): 640-661. <https://doi.org/10.1108/09513570310492335>

[12] ISLAM M. S., FARAH N., and STAFFORD T. F. Factors associated with security/cybersecurity audit by internal audit function: An international study. *Managerial Auditing Journal*, 2018, 33(4): 377-409. <https://doi.org/10.1108/MAJ-07-2017-1595>

[13] LOIS P., DROGALAS G., KARAGIORGOS A., and TSICALAKIS K. Internal audits in the digital era: opportunities risks and challenges. *EuroMed Journal of Business*, 2020, 15(2): 205-217. <https://doi.org/10.1108/EMJB-07-2019-0097>

[14] YUSUF M., & KANJI L. Effect of internal audit

- and accounting information system on the effectiveness of internal control. *Atestasi: Jurnal Ilmiah Akuntansi*, 2020, 3(2): 120-125.
- [15] CARCELLO J. V., EULERICH M., MASLI A., and WOOD D. A. Are internal audits associated with reductions in perceived risk? *Auditing: A Journal of Practice & Theory*, 2020, 39(3): 55-73. <http://dx.doi.org/10.2308/ajpt-19-036>
- [16] ATMANEGARA A., ERLINA E., MUDA I., and ADNANS A. Can Risk Culture Implementation Raising Internal Audit Quality in Case Time Budget Pressure Is High? Proceedings of the 6th Batusangkar International Conference, Batusangkar, 2021. <http://dx.doi.org/10.4108/eai.11-10-2021.2319570>
- [17] SANTOMIL P. D., & GONZÁLEZ L. O. Enterprise risk management and Solvency II: the system of governance and the Own Risk and Solvency Assessment. *The Journal of Risk Finance*, 2020, 21(4): 317-332. <https://doi.org/10.1108/JRF-09-2019-0183>
- [18] LOISHYN A. A., TKACH I. M., LIASHENKO I. O., ZINCHENKO A., and LOBANOV A. A. Research of main international approaches for risk management process's standardization in the context of internal control standardization in the Armed Forces of Ukraine and providing national security. *Espacios*, 2019, 40(20): 14. <https://www.revistaespacios.com/a19v40n20/a19v40n20p14.pdf>
- [19] SETIAWAN R., WISETSRI W., ABDULLAH F. A., SD P., PACHALA V. V., KURNIULLAH A. Z., HASHIM N. A. A. N., and CHRISTABEL G. Making a Difference through Internal Audit Leadership and Enterprise Risk Management. *Productivity Management*, 2021, 26(1): 258-269.
- [20] FRASER J. R. S., QUAIL R., and SIMKINS B. J. Questions asked about enterprise risk management by risk practitioners. *Business Horizons*, 2022, 65(3): 251-260. <https://doi.org/10.1016/j.bushor.2021.02.046>
- [21] KIZIL C., KIZIL F., and DOLAZ B. Reconsidering the Role of Internal Controls in the COVID-19 Era. *The Institute for Internal Controls (IIC) e-Magazine*, 2021, 2(2): 9-19. <http://dx.doi.org/10.13140/RG.2.2.20331.67365>
- [22] HANDOYO B. R. M., & BAYUNITRI B. I. The influence of internal audit and internal control toward fraud prevention. *International Journal of Financial, Accounting, and Management*, 2021, 3(1): 45-64. <https://doi.org/10.35912/ijfam.v3i1.181>
- [23] MASHAYEKHI B., JALALI F., and REZAEI Z. The role of stakeholders' perception in internal audit status: the case of Iran. *Journal of Accounting in Emerging Economies*, 2022, 12(4): 589-614. <https://doi.org/10.1108/JAEE-03-2020-0064>
- [24] ABDELRAHIM A., & AL-MALKAWI H. A. N. The Influential Factors of Internal Audit Effectiveness: A Conceptual Model. *International Journal of Financial Studies*, 2022, 10(3): 71. <https://doi.org/10.3390/ijfs10030071>
- [25] AL-QUDAH L. A. The Impact of Business Risk-Based Audit Approach on Reducing Unsystematic Risks: Evidence from Jordanian Banks. *The Journal of Asian Finance, Economics and Business*, 2021, 8(1): 343-352. <http://dx.doi.org/10.13106/jafeb.2021.vol8.no1.343>
- [26] JARAH B. A. F., AL JARRAH M. A., AL-ZAQEBA M. A. A., and AL-JARRAH M. F. M. The Role of Internal Audit to Reduce the Effects of Creative Accounting on the Reliability of Financial Statements in the Jordanian Islamic Banks. *International Journal of Financial Studies*, 2022, 10(3): 60. <https://doi.org/10.3390/ijfs10030060>
- [27] ATMANEGARA A. W., MUDA I., and ADNANS A. A. Can the Risk Management Implementation Intensify the Internal Auditor Expertise Finding Risk in Local Government? *Webology*, 2021, 18(Special Issue on Current Trends in Management and Information Technology): 646-653. <https://doi.org/10.14704/WEB/V18SI05/WEB18252>
- [28] AL-KHASAWNEH R. O. Multiple Challenges Facing Auditing and Assurance during the Covid-19 in Jordan. In: ALAREENI B., & HAMDAN A. (eds.) *Explore Business, Technology Opportunities and Challenges after the Covid-19 Pandemic*. ICBT 2022. Lecture Notes in Networks and Systems, Vol. 495. Springer, Cham, 2023: 1437-1457. https://doi.org/10.1007/978-3-031-08954-1_125
- [29] FAITEH A., & AASRI M. R. Internal Audit and Added Value: What Is the Relationship? Literature Review. *Universal Journal of Accounting and Finance*, 2022, 10(3): 666-675. <https://doi.org/10.13189/ujaf.2022.100304>
- [30] KAYA Y., & UTKU M. Internal Audit in Public Banks in the Framework of International Internal Audit Standards: The Case of Turkey. In: GRIMA S., & BOZTEPE E. (eds.) *Contemporary Issues in Public Sector Accounting and Auditing (Contemporary Studies in Economic and Financial Analysis, Vol. 105)*. Emerald Publishing Limited, Bingley, 2021: 193-205. <https://doi.org/10.1108/S1569-375920200000105014>
- [31] PRASAD N., HAY D., and CHEN L. Use of in-house internal audit functions in New Zealand. *Meditari Accountancy Research*, 2023, 31(3): 762-785. <https://doi.org/10.1108/MEDAR-03-2020-0803>
- [32] ZAIDAN A. M., & NEAMAH I. S. The Effect of the Quality of Internal Audit Function to Improve the Operational Efficiency of Companies: An Empirical Study. *Webology*, 2022, 19(1): 6990-7019. [https://www.webology.org/data-cms/articles/20220212022323pmwebology%2019%20\(1\)%20-%2083.pdf](https://www.webology.org/data-cms/articles/20220212022323pmwebology%2019%20(1)%20-%2083.pdf)
- [33] RUSTAMLI S. Measuring effectiveness of risk management practices in banking sector. Doctoral dissertation, 2022.
- [34] KRETCHMAR D. F. COVID-19 and Internal Audit: Preparing for the New Normal in 2020 and Beyond. In: *2020 Year in Review*. Internal Audit Foundation, 2020: 7. <https://www.theiia.org/globalassets/documents/internal-audit-foundation/foundation-2020-year-in-review.pdf>
- [35] BOTTMER L., CROUX C., and WILMS I. Sparse regression for large data sets with outliers. *European Journal of Operational Research*, 2022, 297(2): 782-794. <https://doi.org/10.1016/j.ejor.2021.05.049>
- [36] LI Y., YANG X., CHEN L., ZHI Y., and LIU H. Robust Registration of Rail Profile and Complete Detection of Outliers in Complex Field Environment. *IEEE Transactions on Intelligent Transportation Systems*, 2022, 23(11): 20098-20109. <https://doi.org/10.1109/TITS.2022.3177860>
- [37] DELBARIANI-NEJAD A., FARROKHABADI A., and FOTOUHI M. Finite element reliability analysis of edge delamination onset due to interlaminar stresses in composite laminates. *Composite Structures*, 2022, 288: 115410. <http://dx.doi.org/10.1016/j.compstruct.2022.115410>
- [38] SABO A., KUEH Y. C., MUSA R. M., LU F. J., and

KUAN G. Factorial validity and measurement invariance of the psychological need satisfaction in exercise scale across gender. *PLoS One*, 2022, 17(6): e0269155.

<https://doi.org/10.1371/journal.pone.0269155>

[39] ZHANG W., YUAN G., XUE R., HAN Y., and TAYLOR J. E. Mitigating Common Method Bias in Construction Engineering and Management Research. *Journal of Construction Engineering and Management*, 2022, 148(9): 04022089.

[http://dx.doi.org/10.1061/\(ASCE\)CO.1943-7862.0002364](http://dx.doi.org/10.1061/(ASCE)CO.1943-7862.0002364)

[40] ALEKSANDROV B., WEIB C. H., JENTSCH C., and FAYMONVILLE M. Novel goodness-of-fit tests for binomial count time series. *Statistics: A Journal of Theoretical and Applied Statistics*, 2022, 56(5): 957-990.

<https://doi.org/10.1080/02331888.2022.2134384>

[41] LAILA U. E., AHMED N., ARFEEN A., ALI A. Y., KHURRAM M., and KHAN M. A. Mission-critical open-source software adoption model validation using Partial Least Square - Structural Equation Modeling. *Journal of Software: Evolution and Process*, 2023, 35(2): e2514.

<https://doi.org/10.1002/smr.2514>

[42] HAIR J. F., HULT G. T. M., RINGLE C. M., and SARSTEDT M. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Sage, Los Angeles, California, 2014.

[43] JASSEM S. Influence of internal audit functions on enterprise risk management: evidence from Malaysian transportation industry. *International Journal of Business Excellence*, 2022, 26(2): 196-223.

<http://dx.doi.org/10.1504/IJBEX.2019.10028540>

[44] KHADDAFI M., HEIKAL M., and FALAHUDDIN F. Risk management implementation model in moderating risk relationship based on internal audit. *MORFAI Journal*, 2022, 1(2): 311-322.

<http://dx.doi.org/10.54443/morfai.v1i2.103>

参考文献:

[1] TAMIMI O. 从银行业风险管理者的角度看内部审计在风险管理中的作用。 *澳大利亚会计、商业和金融杂志*, 2021, 15(2): 114-129. <http://dx.doi.org/10.14453/aabfj.v15i2.8>

[2] CHOWDHURY A., & SHIL N.C. 新公共管理理念对风险管理、欺诈和腐败控制以及内部审计的影响：来自澳大利亚公共部门组织的证据。 *会计与管理信息系统学报*, 2019, 18(4): 486-508. <https://online-cig.ase.ro/jcig/papers.aspx?idc=51930>

[3] 肖丽. 内部审计在西南地区民营企业风险管理中的应用——以重庆宾鑫集团为例[J].

第三届国家结构和经济主体的司法、行政和人道主义问题国际会议论文集, 多莫杰多沃, 2018年: 516-523. <https://doi.org/10.2991/jahp-18.2018.106>

[4] EULERICH M., KREMIN J. 和 WOOD D. A. 影响执行管理层和审计委员会对内部审计职能工作的认知使用的因素。 *会计进展*, 2019, 45 : 100410. <http://dx.doi.org/10.1016/j.adiac.2019.01.001>

[5] MEXMONOV S. U., & TEMIRKHANOVA M. J. 基于国际内部审计标准的内部审计在乌兹别克斯坦的作用。 *科学研究档案*, 2020, 33(1) : 1-5. <https://ejournal.tsue.uz/index.php/archive/article/view/32>

57

[6] HAMSHARI Y. M. 鉴于新冠肺炎大流行, 内部审计对在安曼证券交易所上市的商业银行根据内部审计标准改善风险管理的影响。 *积极学校心理学杂志*, 2022, 6(7): 4739-4754. <https://journalppw.com/index.php/jpsp/article/view/12360>

[7] KOTB A., ELBARDAN H. 和 HALABI H. 内部审计研究的映射: 安然事件后的结构化文献综述。 *会计、审计与问责杂志*, 2020, 33(8) : 1969-1996. <https://doi.org/10.1108/AAAJ-07-2018-3581>

[8] GAVRYS P. O., GAVRYS M. O., 和 GAVRYS O. M. 工业企业风险管理和内部审计组织的特点。 *商业资讯*, 2020, 9 : 128-135. <https://doi.org/10.32983/2222-4459-2020-9-128-135>

[9] LENZ R., SARENS G. 和 JEPPESEN K.K. 寻找内部审计职能有效性的衡量标准: 制度视角。 *EDP ACS*, 2018, 58 (2) : 1-36. <https://doi.org/10.1080/07366981.2018.1511324>

[10] LARASATI D. A., RATRI M. C., NSIH M. 和 HARYMAWAN

I. 独立审计委员会、风险管理委员会和审计费用。《令人信服的商业与管理》, 2019, 6(1) : 1707042. <http://dx.doi.org/10.1080/23311975.2019.1707042>

[11] SPIRA L. F., & PAGE M. 风险管理: 内部控制的重塑和内部审计角色的转变。 *会计、审计与问责杂志*, 2003年, 16(4) : 640-661. <https://doi.org/10.1108/09513570310492335>

[12] ISLAM M. S., FARAH N. 和 STAFFORD T. F. 与内部审计职能的安全/网络安全审计相关的因素: 一项国际研究。 *管理审计杂志*, 2018, 33(4) : 377-409. <https://doi.org/10.1108/MAJ-07-2017-1595>

[13] LOIS P., DROGALAS G., KARAGIORGOS A. 和 TSIKALAKIS

K. 数字时代的内部审计: 机遇、风险和挑战。 *欧洲医学商业杂志*, 2020, 15(2) : 205-217. <https://doi.org/10.1108/EMJB-07-2019-0097>

[14] YUSUF M., & KANJI L. 内部审计和会计信息系统对内部控制有效性的影响。 *证明: 《伊尔米亚·阿昆坦西杂志》*, 2020, 3(2): 120-125.

[15] CARCELLO J. V., EULERICH M., MASLI A. 和 WOOD D. A. 内部审计是否与感知风险的降低相关? *审计: 理论与实践杂志*, 2020, 39(3): 55-73. <http://dx.doi.org/10.2308/ajpt-19-036>

[16] ATMANEGARA A., ERLINA E., MUDA I. 和 ADNANS A. 在时间预算压力很大的情况下, 风险文化实施能否提高内部审计质量? 第六届巴都桑卡国际会议论文集, 巴都桑卡, 2021年. <http://dx.doi.org/10.4108/eai.11-10-2021.2319570>

[17] SANTOMIL P. D. 和 GONZÁLEZ L. O. 企业风险管理和偿付能力II: 治理体系以及自身风险和偿付能力评估。 *风险金融杂志*, 2020, 21(4) : 317-332. <https://doi.org/10.1108/JRF-09-2019-0183>

[18] LOISHYN A. A., TKACH I. M., LIASHENKO I. O., ZINCHENKO A. 和 LOBANOV A. A.

在乌克兰武装部队内部控制标准化和提供国家安全的背景下风险管理流程标准化的主要国际方法研究。埃斯帕西奥斯, 2019, 40 (20) : 14. <https://www.revistaespacios.com/a19v40n20/a19v40n20p14.pdf>

[19] SETIAWAN R., WSETSRI W., ABDULLAH F. A., SD P., PACHALA V. V., KURNIULLAH A. Z., HASHIM N. A. A. N. 和 CHRISTABEL G. 通过内部审计领导力和企业风险管理发挥作用。生产与管理, 2021, 26(1) : 258-269.

[20] FRASER J. R. S., QUAIL R. 和 SIMKINS B. J. 风险从业者提出的有关企业风险管理的问题。商业视野, 2022, 65(3) : 251-

260. <https://doi.org/10.1016/j.bushor.2021.02.046>

[21] KIZIL C., KIZIL F. 和 DOLAZ B. 重新考虑内部控制在新冠肺炎时代的作用。内部控制研究所(国际集成电路公司)电子杂志, 2021, 2(2): 9-19. <http://dx.doi.org/10.13140/RG.2.2.20331.67365>

[22] HANDOYO B. R. M., & BAYUNITRI B. I. 内部审计和内部控制对预防欺诈的影响。国际金融、会计和管理杂志, 2021, 3(1) : 45-64. <https://doi.org/10.35912/ijfam.v3i1.181>

[23] MASHAYEKHI B., JALALI F. 和 REZAEI Z. 利益相关者看法在内部审计状况中的作用: 伊朗案例。新兴经济体会计杂志, 2022, 12(4): 589-614. <https://doi.org/10.1108/JAEE-03-2020-0064>

[24] ABDELRAHIM A., & AL-MALKAWI H. A. N. 内部审计有效性的影响因素: 概念模型。国际金融研究杂志, 2022, 10(3) : 71. <https://doi.org/10.3390/ijfs10030071>

[25] AL-QUDAH L. A. 基于业务风险的审计方法对减少非系统性风险的影响: 来自约旦银行的证据。亚洲金融、经济与商业杂志, 2021, 8(1): 343-352. <http://dx.doi.org/10.13106/jafeb.2021.vol8.no1.343>

[26] JARAH B. A. F., AL JARRAH M. A., AL-ZAQEBA M. A. A. 和 AL-JARRAH M. F. M. 内部审计在减少创造性会计对约旦伊斯兰银行财务报表可靠性的影响方面的作用。国际金融研究杂志, 2022, 10(3) : 60. <https://doi.org/10.3390/ijfs10030060>

[27] ATMANEGARA A. W., MUDA I. 和 ADNANS A. A.

风险管理实施能否强化内部审计师在地方政府中发现风险的专业知识? 网络学, 2021, 18 (管理与信息技术当前趋势特刊) : 646-

653. <https://doi.org/10.14704/WEB/V18SI05/WEB18252>

[28] AL-KHASAWNEH R. O. 约旦新冠肺炎疫情期间审计和保证面临的多重挑战。见: AL AREENI B. 和 HAMDAN A. (编辑) 探索新冠肺炎大流行后的商业、技术机遇和挑战。集成电路BT 2022. 网络与系统讲义, 卷. 495. 查姆·施普林格, 2023

: 1437-1457. https://doi.org/10.1007/978-3-031-08954-1_125

[29] FAITEH A., & AASRI M. R. 内部审计和增值: 什么关系? 文献综述。环球会计与金融杂志, 2022, 10(3) : 666-

675. <https://doi.org/10.13189/ujaf.2022.100304>

[30] KAYA Y., & UTKU M. 国际内部审计标准框架下的公共银行内部审计: 土耳其案例。见: GRIMA S. 和 BOZTEPE E. (编辑) 公共部门会计和审计的当代问题 (经济和金融分析的当代研究, 第105卷)。翡翠出版有限公司, 宾利, 2021 : 193-205. <https://doi.org/10.1108/S1569-375920200000105014>

[31] PRASAD N., HAY D. 和 CHEN L. 在新西兰使用内部审计职能。梅迪塔里会计研究, 2023, 31(3): 762-785. <https://doi.org/10.1108/MEDAR-03-2020-0803>

[32] ZAIDAN A. M., & NEAMAH I. S. 内部审计职能质量对提高公司运营效率的影响: 实证研究。网络学, 2022, 19(1): 6990-7019. [https://www.webology.org/data-cms/articles/20220212022323pmwebology%2019%20\(1\)%20-%2083.pdf](https://www.webology.org/data-cms/articles/20220212022323pmwebology%2019%20(1)%20-%2083.pdf)

[33] RUSTAMLI S. 衡量银行业风险管理实践的有效性。博士论文, 2022年.

[34] KRETTCHMAR D. F. 新冠肺炎和内部审计: 为2020年及以后的新常态做好准备。见: 2020年回顾。内部审计基金会, 2020年: 7. <https://www.theiia.org/global-assets/documents/internal-audit-foundation/foundation-2020-year-in-review.pdf>

[35] BOTTMER L., CROUX C. 和 WILMS I. 具有异常值的大型数据集的稀疏回归。欧洲运筹学杂志, 2022, 297(2) : 782-794. <https://doi.org/10.1016/j.ejor.2021.05.049>

[36] LI Y., YANG X., CHEN L., ZHI Y., 和 LIU H. 复杂现场环境下钢轨轮廓的稳健配准和异常值的完整检测。IEEE智能交通系统学报, 2022年, 23(11) : 20098-20109. <https://doi.org/10.1109/TITS.2022.3177860>

[37] DELBARIANI-NEJAD A., FARROKHABADI A. 和 FOTOUHI M. 复合材料层压板中层间应力引起的边缘分层起始的有限元可靠性分析。复合结构, 2022, 288 : 115410. <http://dx.doi.org/10.1016/j.compstruct.2022.115410>

[38] SABO A., KUEH Y. C., MUSA R. M., LU F. J., 和 KUAN G. 跨性别运动量表心理需求满足的因子效度和测量不变性。《公共科学图书馆一号》, 2022年, 17(6) : e0269155. <https://doi.org/10.1371/journal.pone.0269155>

[39] 张文, 袁刚, 薛瑞, 韩Y., 泰勒·J.E. 减轻建筑工程和管理研究中的通用方法偏差。建筑工程与管理学报, 2022, 148(9): 04022089. [http://dx.doi.org/10.1061/\(ASCE\)CO.1943-7862.0002364](http://dx.doi.org/10.1061/(ASCE)CO.1943-7862.0002364)

[40] ALEKSANDROV B., WEIB C. H., JENTSCH C. 和 FAYMONVILLE M. 二项式计数时间序列的新颖拟合优度检验。统计学: 理论与应用统计学杂志, 2022, 56(5): 957-990. <https://doi.org/10.1080/02331888.2022.2134384>

[41] LAILA U. E., AHMED N., ARFEEN A., ALI A. Y., KHURRAM M. 和 KHAN M. A. 使用偏最小二乘结构方程建模进行关键任务开源软件采用模型验证。软件杂志: 演化与过程, 2023, 35(2) : e2514. <https://doi.org/10.1002/smr.2514>

[42] HAIR J. F., HULT G. T. M., RINGLE C. M. 和

-
- SARSTEDT M.
偏最小二乘结构方程模型(偏最小二乘扫描电镜)入门。
塞奇, 加利福尼亚州洛杉矶, 2014年。
- [43] JASSEM S.
内部审计职能对企业风险管理的影响: 来自马来西亚运
输业的证据。国际卓越商业杂志, 2022, 26(2): 196-
223。 <http://dx.doi.org/10.1504/IJBEX.2019.10028540>
- [44] KHADDAFI M., HEIKAL M., FALAHUDDIN F.
基于内部审计的风险关系调节风险管理实施模型。莫菲
杂志, 2022, 1(2): 311-
322。 <http://dx.doi.org/10.54443/morfai.v1i2.103>