

Risk Management Culture, Structure, and Process – Theoretical Insights and Empirical Evidence

Minela Nuhić-Mešković¹, & Admir Mešković²

¹ School of Economics and Business, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

² Faculty of Economics, University of Tuzla, Tuzla, Bosnia and Herzegovina

Correspondence: Admir Mešković, Faculty of Economics, University of Tuzla, 75000 Tuzla, Bosnia and Herzegovina.

Received: June 21, 2023

Accepted: September 7, 2023

Online Published: September 28, 2023

doi:10.5539/ibr.v16n10p10

URL: <https://doi.org/10.5539/ibr.v16n10p10>

Abstract

In the contemporary business environment, companies face a wide range of risks that necessitate effective risk management strategies. Risk management can be approached through either a traditional or integrated concept, which hinges on a company's ability to avoid, reduce, and transform risks into opportunities.

This research aims to investigate the risk management practices employed by joint-stock companies in Bosnia and Herzegovina. The study will focus on evaluating the risk management culture, structure, and processes implemented by these companies.

The research was conducted using a questionnaire distributed to a sample of 141 companies listed on two stock exchanges in B&H. The survey included 31 identified risk management components related to culture, processes, and organizational structure. To enhance accuracy, the survey responses were improved using a Likert scale, replacing the previous "Yes – No" dummy approach. Before administering the survey, all components were validated by a group of experts. The findings revealed that companies in Bosnia and Herzegovina (B&H) have inadequately developed components of an integrated risk management concept.

The research results suggest that B&H companies primarily rely on traditional risk management approaches, failing to keep up with the global trend of implementing risk management standards. This situation may lead to adverse implications for BH companies and its economy.

Keywords: ERM, risk culture, organizational structure, risk management process, risk management

1. Introduction

In today's dynamic business environment, companies encounter a diverse array of risks that necessitate effective management strategies. The traditional approach to risk management, once prevalent globally, is now being surpassed by the integrated method, which is increasingly adopted by companies worldwide. As asserted by Tan & Lee (2021), risk management plays a critical role in the success of any enterprise, significantly enhancing the value and efficacy of firms (Manas & Setapa, 2021).

The traditional approach to risk management has a long-standing history in business practices. It primarily relies on a silo-based structure, where risk management is confined to individual business units, departments, and specific functions. While specialization is essential, this approach limits a comprehensive understanding of risks that the entire organization faces, hindering top management's insight into the overall risk landscape. Consequently, this segmented approach often results in an inconsistent risk management strategy, as each business unit's risk appetite is set independently by managers. The lack of coordination prevents the identification of interconnected events and risk factors across different silos, leading to unintended consequences and increased exposure to risk. Furthermore, this traditional risk management approach predominantly focuses on the negative aspect of risk, leading to strategies aimed at reducing and eliminating risks (Harrington, et al., 2002).

As the business landscape evolves, companies recognize the importance of adopting an integrated risk management approach. This method emphasizes a holistic view of risks and their interactions, enabling better decision-making and risk mitigation strategies. By embracing this forward-thinking approach, organizations can

proactively address challenges and seize opportunities, resulting in improved overall performance and resilience. The integrative approach to risk management represents a modern and comprehensive form of organizational risk management. By addressing risks at all levels of the organization, this approach ensures a holistic perspective through transparent information exchange across different "silos" or units. Taking a top-down view of risks allows for the identification and quantification of most risks within the organization, along with analyzing the interconnections between individual risks. This approach treats the organization's risk as a dynamic portfolio, as described by Viscelli et al. (2017). Through this integrative approach, it becomes possible to manage risks that are sufficiently negatively correlated between different silos, providing a form of protection or hedging within the organization itself. This proactive stance towards risk enables a deeper understanding of risk as not solely a threat but also an opportunity. Embracing risk as an opportunity can contribute to safeguarding existing values and fostering the creation of new ones, as pointed out by Jalal et al. (2011).

Although the traditional risk management approach has a long business practice, the integrated concept is at the basis of the international standards for risk management ISO and COSO ERM. The chosen approach to risk, according to Simouna-Iulia (2014), risk plays a major role in the company's ability to avoid, reduce, and turn risks into opportunities.

Some empirical findings from studies conducted in the region suggest that companies in the area continue to rely on traditional approaches for risk management. However, there are currently no studies that specifically confirm this situation in Bosnia and Herzegovina (B&H). As a result, the primary objective of this paper is to address this knowledge gap and shed light on the risk management practices in B&H. The research addresses the previously unexplored concepts and methods of risk management in joint-stock companies in B&H. It focuses on three main areas: risk management culture, development of organizational processes, and organizational structure. The research question to be answered is:

RQ: "What risk management approaches are applied by companies in B&H?"

The following hypothesis is being tested:

H₁: Companies in Bosnia and Herzegovina predominantly rely on traditional risk management approach.

In the upcoming section of the article, we will provide a comprehensive overview of the relevant literature related to risk management practices. Following that, in the third section, we will outline the research methodology utilized for this study, including details on the sample selection process. Moving on, the fourth part of the article will present the research findings, detailing the risk management approaches employed by companies in B&H. Finally, the last section will offer a concise summary of the primary discoveries and key insights obtained from the research.

Undoubtedly, the results and findings will bring benefits not only to academics but also to all stakeholders. The research outcomes will improve the comprehension of risk management concepts and aid in identifying crucial factors. This will facilitate the implementation of corrective planning and organizational measures to enhance risk management practices. The research outcomes are anticipated to make a substantial contribution to improving risk management practices, thereby leading to better risk management outcomes for the organization and all its stakeholders.

Based on our findings, it is evident that companies in Bosnia and Herzegovina lack well-developed components of an integrated risk management concept. The analysis of risk management culture, structure, and processes highlights that B&H companies continue to primarily adopt traditional risk management approaches, and they are not aligning with the global trend of implementing risk management standards.

Theoretical Concepts Of Risk Management

Two general approaches to risk management are recognized in the literature: traditional and integrative. The traditional concept of risk management is characterized by a silo-based concept of risk management, where company risks are identified, assessed, and managed at the level of individual business units, departments and functions, which very often results in a mismatched approach to risk management in the company. Segmentation at the level of business functions very often results in an increase in risk exposure. The focus of this approach is on the negative side of risk, which consequently results in risk management based on reduction and elimination strategies (Harrington, et al., 2002).

An integrative approach to risk management methodically considers all individual activities of the organization, and recognizes the positive, upside, and negative, downside, aspects of risk with the aim of protecting and creating new value and reducing the consequences of risk. In this sense, this approach does not rely exclusively

on strategies to eliminate and reduce the negative effects of risk, but approaches a risk management process that ensures the identification, measurement, control, exploitation and monitoring of all relevant risks with the aim of achieving long-term value for owners (Celona et al., 2011). Although the focus of the approach is on key risks, this approach considers all types of risks that the organization may face, and the overall risk exposure is expressed at the level of the organization. The integrative risk management approach proposes a paradigm shift in risk management that enables organizations to assess their position on risks, identify and prioritize risks, and determine which risks should be accepted, mitigated or avoided in the process of integrative and holistic auditing.

The main difference of this approach compared to the traditional one is its integrative nature, which combines different types of risks and unifies them towards the general goals of the organization (Rodriguez and Edwards, 2009). Banham (2005) summarizes the main differences between traditional and integrative approaches to risk management.

Table 1. Traditional vs. integrated risk management approach

| Traditional risk management approach | Integrated approach to risk management |
|---|---|
| Segmented by departments/silos | Comprehensive, Integrative/holistic |
| The risk is considered individually | Risk is seen as part of business strategy |
| Risk identification, analysis and risk reduction | Risk portfolio development, risk optimization |
| Random risk quantification | Risk monitoring and measurement |
| Risk as a threat | Risk as an opportunity |
| Focus on loss reduction within one business unit | Focus on reducing risk, preserving sustainability, protecting, and increasing value at the organizational level |
| Reactive and sporadic | Proactive and continuous |

Source: Banham (2005)

Conceptual, theoretical frameworks, standards of risk management in organizations, which makes risk management a standardized process:

- ISO 31000:2009 Risk Management – Principles and guidelines, which was revised in 2018 to ISO 31000:2018 – Risk management guidelines.
- COSO ERM – Integrated framework for risk management developed by the Committee of Sponsoring organizations of Tradeway Commission in 2004, revised in 2017 in the standard COSO ERM – Integrating with strategy and performance supports the creation and implementation of risk management processes on an integrated, holistic basis.

Although there are numerous guidelines, instructions, and guides adopted for risk management, their common denominator is a strategically integrated approach to risk management at all organizational levels. According to this perspective, risk management is closely related to strategy and permeates all levels of the organization (Fraser and Simkins, 2010), aiming to foster a culture of risk management throughout the entire organization (Farrell, Gallagher, 2015).

The ISO 31000 standard for risk management is widely regarded as one of the best practices for designing risk management systems in both profit and non-profit organizations. This standard incorporates the best elements of previously developed risk management standards. Initially established by the International Organization for Standardization (ISO), the framework for risk management was subsequently revised in 2018. This update was prompted by the evolution of economic systems and the emergence of new risk factors that needed to be addressed to ensure the standard's relevance and effectiveness.

The revised version of the ISO framework ISO 31000:2018 places more emphasis on the involvement of senior management and the integration of risk management into the organization, compared to the original version. It recommends developing a statement or policy affirming the commitment to risk management, assigning authority, responsibility, and accountability at appropriate levels within the organization, and allocating necessary resources to risk management. Furthermore, the revised standard now advocates integrating risk management into the structure, processes, objectives, strategy, and activities of the organization, aligning them with the organizational culture (Rampini et al., 2019). It also prioritizes value creation as a key driver of risk management and includes principles such as continuous improvement, stakeholder involvement, adaptability to the organization, and consideration of human and cultural factors (Hutchins, 2018). The revised content is simplified to maintain an open systems model, enabling regular feedback exchange with the external environment and adaptation to diverse needs and contexts (Simona, Cristian, 2018). Risk management according

to ISO 31000 is built on established principles, frameworks, and processes, ensuring efficiency, effectiveness, and consistency throughout the risk management process.

COSO ERM (Enterprise Risk Management) from 2017 distinctly differentiates between risk management and internal control. Its primary objective is to promote the integration of risk management strategy and processes, linking them explicitly to achieved performance, and enhancing their connection with the decision-making process in the organization (Prewett and Terry, 2018). The framework places greater emphasis on the relationship between risk and value, highlighting the advantages of an integrative approach to risk management. Additionally, it underscores the role of organizational culture in achieving successful ERM (Fox, 2018). COSO suggests that over time, ERM can enhance organizational resilience by enabling the anticipation and response to changes. It aids organizations in identifying factors that represent not only risks but also opportunities for change and the ways in which that change can impact performance and alter strategy. The guidelines also emphasize the importance of setting and periodically adjusting the strategy, in line with the continuous opportunities for value creation and the challenges that arise (Rubino, 2018). By synthesizing individual components of conceptual and regulatory frameworks, several authors, including Zheng et al. (2010), Viselli et al. (2016), Lai, Shad (2017), Lai, Samad (2010), and Monda and Giorgino (2013), have identified three key components crucial for effective and efficient risk management: organizational risk culture, organizational processes and organizational structure adapted to these processes.

Risk management culture

In the context of the risk management process, risk culture reflects shared values, goals, practices, mechanisms and attitudes that embed risk in the organization's decision-making processes and risk management in its activities (RMA, 2013). A well-designed and implemented risk culture in an organization creates a favorable environment for ERM implementation. Social aspects involved in ERM implementation cannot be neglected (Jean-Jules & Vicente, 2021). Ghafoori et al.(2023) identified seven unique factors of risk culture: management commitment to risk, psychological safety, incentives, risk capability and training, risk communication, risk strategy, and risk support of risk culture.

A risk culture that is effectively and efficiently embedded in business processes and practices can be a carrier of additional value in the organization (Kanu, 2020). A study conducted by Protiviti and RMA (2013) emphasizes the importance of management's commitment to developing a risk culture for effective and efficient risk management processes. Zhao et al (2013) appreciate that the commitment of management is the most important component of organizational culture, because risk management goes precisely from the "top down" direction.

Risk management policy implies basic general principles of risk management of organizations, which is relevant for all aspects of risk management. Common values, beliefs, attitudes are based on it, which is why it is necessary to ensure that the risk management policy is understandable and accessible to all members of the organization (Moeller, 2007). A risk management policy is not only a written document, but also implemented in the day-to-day operations of the organization (COSO, 2004). ISO (2018) states that the risk management policy should take into account the company's goals, responsibilities, as well as the framework of the entire risk management process (Hopkin, 2012).

According to RMA (2013), the existence of established appetites for risk can be considered as an indicator of the establishment of a risk culture. The materiality of the risk and the organization's capacities at its disposal, which in addition to financial resources also include other resources, human, material, etc., are related to defining risk appetite. In order to acquire an effective risk management culture, the framework for risk appetite should be formally established, well defined and supported by a clear rational policy that is consistent with ERM and well communicated throughout the company (S&P, 2013).

Hillson et al. (2011) identified four ways in which understanding and expressing risk appetite can benefit organizations. Firstly, comprehending and expressing risk appetite aids in the process of setting strategies, enabling organizations to align their risk-taking behavior with their overall objectives. Secondly, it results in a balanced risk profile, ensuring that the organization takes on risks that are acceptable and aligned with its risk tolerance, while avoiding those that may be detrimental. Thirdly, understanding and expressing risk appetite facilitate the identification of risks that should be avoided, as well as risks that may present opportunities to be taken advantage of. Lastly, this approach contributes to more effective risk management by establishing appropriate limits for risk-taking. This, in turn, leads to better and more consistent decisions by decision-makers, ultimately resulting in greater shareholder value. By embracing risk appetite as a guiding principle, organizations can enhance their risk management practices and achieve a more resilient and successful operation in an increasingly uncertain business environment.

Risk tolerance is defined as "an acceptable level of variation in relation to the achievement of a specific objective" (COSO, 2004). On the other hand, S&P (2013) describes risk tolerance as "a quantitative statement of risk appetite," specifying the maximum acceptable losses and guiding management in making risk-related decisions. It is essential for an organization to have a clear rationale for its chosen risk tolerance, which should directly relate to its strategic goals, available resources, and expected values, and be aligned with its risk appetite. In practice, the units used to measure the company's performance can also be used as the units for expressing risk tolerance. By establishing well-defined risk tolerance levels, organizations can effectively manage risk, ensuring that the risks taken are within acceptable limits and in harmony with the organization's overall risk management strategy and objectives. This approach promotes consistency in decision-making and aids in maximizing value creation while minimizing the potential negative impacts of risks.

Richter (2014) states that an appropriate and healthy risk culture encompasses several aspects. The author primarily emphasizes the importance of the integrity of the organization, and the establishment of clear risk management principles that pervade the entire organization. Risk management guidelines must be promoted by company managers, and all employees are involved and responsible for risk management. Promoting active learning and rewarding risk-appropriate behavior is necessary for the company's survival and adaptation to new risks.

In the domain of motivation, organizations should align motivation systems through performance management models, which implies their alignment with the risks taken and the responsibilities assigned and the results achieved. Also, this component implies the provision of incentive mechanisms that encourage prudent risk-taking at all organizational levels. Farrel and Hoon (2009) argue that developing an organizational risk culture is essential and a necessary element of implementing good risk management practices.

Risk process

Conceptual framework of integrative risk management differs from the traditional concept of risk management, including formalised risk management processes (Lundqvist, 2015). Risk management processes typically include risk management objectives, identification and assessment, risk treating, and monitoring and reporting. The risk management process, together with personnel capability and quality management system positively affect the performance of a companies (Rizal & DP, 2022).

In the process of creating value for shareholders, companies are faced with numerous activities and processes that carry with them certain risks. Ignorance, poor assessment and management of the main risks faced by the company can result in significant losses of value for the most important stakeholders. Therefore, management must implement processes for efficient management of all significant risks faced by the company. The risk management process is carried out in five interconnected steps: 1) Determination of strategy and objectives 2) Risk identification 3) Risk assessment 4) Risk treatment 5) Risk control 6) Risk monitoring and reporting. Different techniques and tools are used for effective results in certain stages of the risk management process. Colin (2018) published an overview of the most important methods and techniques for the effective implantation of risk-managed processes. The techniques used can have a qualitative or quantitative character. The first describes the risks and their possible effects on the organization's performance in a descriptive way, while quantitative techniques determine the range of risk's impact on the organization's results, including the probability of those effects. Bognar and Benedek (2023) emphasize the importance of individual risk assessment, using more than one risk assessment method in complex environment. According to Simon(2000) in determining the most appropriate technique, factors are considered: the availability of human, time, and infrastructure resources for the analysis, as well as the analyst's experience in applying the techniques, the complexity of the situation, the phase, available information and the purpose of the analysis.

Organizational structure

Carey (2011) emphasizes the importance of organizational structure on the effectiveness of risk management in financial institutions, and his views are supported by Yaraghi, Langhe (2011) who claim that organizational structure is a crucial success factor in the risk management model. Protiviti (2011) emphasizes that without an appropriate organizational structure, risk management will not be effective. Lunqvist (2015) appreciates that the conceptual framework of ERM differs from the traditional concept of risk management for the management structure that is adapted to risk management processes, which is reflected in the structure, centralized approach, established responsibilities, and formalization of the process. Some researchers showed that crises such as COVID-19 can have an impact on the organizational structure and risk-taking behavior of risk officers (Metwally & Diab, 2022). The organizational structure plays a pivotal role in risk management's effectiveness within financial institutions, as highlighted by Carey (2011) and supported by Yaraghi, Langhe (2011).

According to Protiviti (2011), an appropriate organizational structure is vital for risk management to be effective. Zhu and Mishra (2023) stated that the structure and operations of a company reflect its ERM system. Lunqvist (2015) also acknowledges that the conceptual framework of Enterprise Risk Management (ERM) differs from the traditional concept of risk management, with an emphasis on the management structure's alignment with risk management processes, including structure, centralized approach, established responsibilities, and formalization of the process. Furthermore, research by Metwally & Diab (2022) indicates that crises such as the COVID-19 pandemic can impact the organizational structure and risk-taking behavior of risk officers. The effectiveness of risk management is contingent upon an organization's ability to establish a sound and appropriate organizational structure that supports risk management practices and aligns with the organization's overall risk management strategy. COSO (2004) identified the organizational structure of risk management as one of the most important components of risk management in an organization. A formal, well-defined, and independent organizational structure of risk management is the basis of effective implementation of risk management (S&P, 2005). In this sense, it is the board of directors that has the ultimate responsibility in ensuring adequate systems of internal controls and risk management. Lam (2001) recognizes the responsibilities of the board of directors in terms of designing a good governance structure to organize risk management and oversight activities. Also, the board is responsible for establishing risk policies and tolerance levels, that is, articulating risk appetite. Finally, boards should establish assurance and feedback processes to assess the effectiveness of the risk management process. Garratt (2010) states that risk management must be integrated into the four basic responsibilities (functions) of the board of directors: policy formulation, strategy formulation, management control and accountability to owners.

The organizational structure of risk management should enable periodic review and insight into existing risks, fulfilling at the same time its supervisory role. In the context of responsibility towards the owners in the process of risk management, the basic task of the board is to ensure the acceptance of risks within acceptable capacities, which will contribute to the preservation and creation of new value. Malik et al (2020) in the context of the organizational structure emphasize the importance of the existence of the risk committee, looking at it through several dimensions: size, independence, number of meetings, expert composition, and gender diversity. Protiviti (2011) emphasizes that the addition of independent directors to risk committees is necessary to build objective communication between the board and management regarding risk management activities.

Lam (2001) recognizes the importance of the Chief Risk Officer (CRO) function. De La Rosa (2006) states that a good CRO has a developed awareness of risk, knows the main business processes, has quality education in risk management, communication skills that include the ability to work closely with individuals at all levels, and adaptation skills. According to Moller (2007), the main responsibilities of the CRO are aimed at managing the risk assessment process throughout the organization, implementing appropriate corrective actions, and communicating problems and events at all levels of the company. Characteristics of a strong CRO include independence from any line of business, membership in the executive / board of directors which gives it direct influence over strategy, and gives it the ability to challenge and potentially veto risk-related decisions.

A direct line of reporting to the executive director, and according to some research, a secured line of direct reporting to the Supervisory Board are additional indicators of the strong function of the CRO (IFC, 2012).

Many studies use the existence of an ERM function as a proxy indicator of ERM implementation (Liebenberg, Hoyt, 2003; Hoyt and Liebenberg, 2011, Lechner, Gatzert, 2018).

Burnaby, Hass (2009) give special importance to a separate ERM department, led by the CRO, in an efficient risk management process. Moeller (2007) states that for the efficient work of the CRO, it is necessary to provide a supporting department, with a supporting group of experts. He also suggests that a separate risk management department should have a status like the internal audit function, which has the human resources to review all levels and controls in the organization. The author also recognizes the main differences between the internal audit department and the risk management department. Unlike the internal audit department, which has the mandate to review internal controls and recommendations for improvement, the risk department recognizes risks with a proactive approach, and while the audit department does not participate in the implementation of recommendations, the risk management department is involved in risk management processes at all stages, from identification, assessment, management, monitoring to documenting and reporting on risks.

The risk management function in any organization should be given appropriate status, authority, and resources (IFC, 2012). A separate department for risk management, which is ensured independence from other business functions, should cover all types of risks and business lines, while being directly responsible to the CRO, which reports directly to the executive director or the board of directors. Further functional specialization is possible

depending on the risk management policy and organizational needs. A dedicated risk function plays a key role in identifying, assessing and managing the overall risks facing an organization. In the risk function, sufficient relevant experts should be employed, who not only have a good understanding of the concept of risk itself, but also of the products and markets that are monitored, and adequate technological resources should be provided.

The independence of the ERM function is associated with greater oversight, and a lower likelihood of possible fraud and misreporting (Malik et, 2020). Ng et al. (2013) claim that an independent assessment of key risk areas could minimize the firm's exposure to significant risks. The risk management function, just like other business functions, must have an independent reporting line directly to senior management - the CEO. Elimination of a possible conflict of interest is achieved by establishing key controls and ensuring the development of functions. Separation of functions is an imperative step towards establishing proper risk management (IFC, 2012).

2. Method

The main objective of this research is to address the lack of adequate knowledge about the risk management practices employed by companies in Bosnia and Herzegovina. To achieve this, the study focuses on understanding the various elements of the risk management culture, processes, and organizational structure that support risk management.

The research was conducted in 2021, on joint-stock companies operating in Bosnia and Herzegovina, specifically those with stable business continuity, regardless of their financial performance. Companies undergoing bankruptcy proceedings, liquidation, organizational/legal changes, or facing blocked banking accounts were excluded from the study. Additionally, investment funds were not considered due to their unique financial reporting characteristics. The sample was stratified to represent the population's sectoral distribution accurately. A total of 579 e-mail addresses were approached with the survey questionnaire, and 141 companies provided complete responses.

The questionnaire used for the survey asked the companies in Bosnia and Herzegovina to conduct self-assessments on a scale of 1 to 5 for each of the 31 components related to effective and efficient risk management. Based on components previously identified in the literature (see: Monda & Giorgino, 2013), the authors developed a questionnaire.

The identified components underwent validation by an expert group led by Monda & Giorgino (2013). Additionally, a local expert group comprising eight members from Bosnia and Herzegovina confirmed the relevance of these components for assessing the maturity of risk management models in developing countries. Unlike Monda and Giorgino's binary approach (yes or no questions), the survey questionnaire used a scale ranging from 1 to 5, where 1 represented "not at all," 2 "minimally," 3 "partially," 4 "significantly," and 5 "completely" in terms of risk management implementation. Additionally, the assessment of internal consistency or reliability was conducted using the Cronbach's alpha test.

The surveys were directly gathered from senior top management and individuals responsible for risk management.

In the paper, descriptive statistics were primarily used. The data analysis was performed using the Stata software.

3. Results

Through a survey of companies, an analysis was carried out by individual components that are recognized in the literature as part of an effective and efficient risk management model. There are 31 components that encompass aspects of risk management culture, organizational processes, and organizational structure. On a scale from 1 (not at all) to 5 (completely), company managers evaluated the extent to which individual components were implemented. The Cronbach's alpha reliability test value of 0.9799 confirmed the internal consistency of the questionnaire.

In the segment of the organizational culture of risk management, which included 10 individual components, out of 141 companies from the sample, it was determined that more than 34% of companies were evaluated in the range from 1 (not at all) to 3 (partially) for all components.

Regarding individual components, 65.96% of companies from the sample rated the "Commitment of management and board of directors" component with grades 4 and 5, which represents the best-rated individual component in the segment of risk management culture. It is followed by the components "Clear communication of goals, policies and risk tolerance thresholds throughout the entire organization", with 42.55% of responses - completely, and significantly, and the component "Sharing information about risk", where 39% of companies declared that in the last three years or longer, has implemented an information system. 63.83% of companies

stated that they did not implement any of the risk management standards. 25.54% of them rated this component minimally or partially, while only 10.64% of companies rated that some of the risk management standards were fully or significantly implemented. This is also the worst-rated component in the segment of organizational culture. Almost a third of companies (32.62%) declared that they do not implement learning programs for employees at all, while more than half (51.06%) implement such programs on an annual or semi-annual basis. Only 16.32% of companies from the sample stated that learning programs are conducted quarterly, monthly, or more often.

Table 2. Responses per component – Organisational risk culture

| Components | 1 – not at all | | 2 - minimal | | 3 - partially | | 4 - significant | | 5 - completely | | Total | |
|---|-------------------|-------|----------------|-------|------------------|-------|--------------------|-------|-------------------|-------|-------|--------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Board of directors and top management commitment | 4 | 2.84 | 7 | 4.96 | 37 | 26.24 | 52 | 36.88 | 41 | 29.08 | 141 | 100.00 |
| Clear defining and communicating of a RM policy | 28 | 19.86 | 9 | 6.38 | 58 | 41.13 | 33 | 23.40 | 13 | 9.22 | 141 | 100.00 |
| Risk appetite definition and an explicit risk-appetite statement | 54 | 38.30 | 16 | 11.35 | 33 | 23.40 | 29 | 20.57 | 9 | 6.38 | 141 | 100.00 |
| Definition of a risk tolerance threshold for each objective of the organisation considering the risk appetite | 21 | 14.89 | 25 | 17.73 | 52 | 36.88 | 34 | 24.11 | 9 | 6.38 | 141 | 100.00 |
| Clear communicating of objectives, policies, and risk tolerance thresholds throughout the entire organisation | 8 | 5.67 | 18 | 12.77 | 55 | 39.01 | 45 | 31.91 | 15 | 10.64 | 141 | 100.00 |
| Common risk language shared within the organisation | 90 | 63.83 | 17 | 12.06 | 19 | 13.48 | 9 | 6.38 | 6 | 4.26 | 141 | 100.00 |
| Sharing and communicating risk information | 35 | 24.82 | 21 | 14.89 | 30 | 21.28 | 13 | 9.22 | 42 | 29.79 | 141 | 100.00 |
| Organising learning programs for employees | 46 | 32.62 | 51 | 36.17 | 21 | 14.89 | 19 | 13.48 | 4 | 2.84 | 141 | 100.00 |
| Designing a remuneration and incentive system | 28 | 19.86 | 43 | 30.50 | 36 | 25.53 | 28 | 19.86 | 6 | 4.26 | 141 | 100.00 |
| Integrating RM with the Performance Measurement System (PMS), particularly with the Balanced Scorecard (BSC) | 25 | 17.73 | 42 | 29.79 | 49 | 34.75 | 20 | 14.18 | 5 | 3.55 | 141 | 100.00 |

Source: Authors

Almost a third of the companies (31.91%) from the sample stated that the organizational processes are not covered by the information system at all, a third of them rated this component minimally or partially, while 34.76% of the companies stated that the organizational processes are covered by the information system significantly or entirely. Although more than 36.17% of companies assessed that they have established risk identification and treatment processes, only 26.96% of companies assessed that they keep and maintain risk registers, while 17.73% stated that the risk registers are in the preparation phase. Stjepić et al. (2021), in their research on sample of Croatian companies, note that Croatian companies are lacking the technology infrastructure as well as a possible

lack of BIS integration with existing systems, tools, software, business processes, and values within the Croatian SMEs. The largest percentage of companies perform risk assessment on an annual basis (44.68%), using the subjective assessment of appraisers (39.01%). Only 4.96% of companies from the sample assessed that the integration of all risks and assessment of the connection between them was fully implemented.

Table 3. Responses per component – Risk Management Process

| Components | 1 – not at all | | 2 - minimal | | 3 - partially | | 4 - significant | | 5 - completely | | Total | |
|---|----------------|-------|-------------|-------|---------------|-------|-----------------|-------|----------------|-------|-------|--------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Integration of RM in the strategic and business plans | 13 | 9.22 | 41 | 29.08 | 45 | 31.91 | 29 | 20.57 | 13 | 9.22 | 141 | 100.00 |
| Implementation of an efficient and effective process for identifying all relevant potential risks | 9 | 6.38 | 23 | 16.31 | 58 | 41.13 | 33 | 23.40 | 18 | 12.77 | 141 | 100.00 |
| Creation and maintenance of a risk register | 33 | 23.40 | 45 | 31.91 | 25 | 17.73 | 19 | 13.48 | 19 | 13.48 | 141 | 100.00 |
| Risk classification into risk categories (e.g., strategic, operational, financial, and compliance, or strategic, operational, financial, and hazards) | 13 | 9.22 | 30 | 21.28 | 55 | 39.01 | 25 | 17.73 | 18 | 12.77 | 141 | 100.00 |
| Periodical repetition of the risk assessment process | 21 | 14.89 | 63 | 44.68 | 24 | 17.02 | 21 | 14.89 | 12 | 8.51 | 141 | 100.00 |
| Using qualitative and quantitative techniques in risk assessment formal process | 24 | 17.02 | 55 | 39.01 | 19 | 13.48 | 4 | 2.84 | 39 | 27.66 | 141 | 100.00 |
| Prioritisation of risks on a residual basis | 19 | 13.48 | 40 | 28.37 | 45 | 31.91 | 27 | 19.15 | 10 | 7.09 | 141 | 100.00 |
| Risk integration in a risk portfolio and evaluation of correlations between them | 32 | 22.70 | 35 | 24.82 | 44 | 31.21 | 23 | 16.31 | 7 | 4.96 | 141 | 100.00 |
| Defining treatment strategy (avoidance, reduction, sharing, retention), considering a trade-off between costs and benefits, for each risk | 9 | 6.38 | 25 | 17.73 | 56 | 39.72 | 39 | 27.66 | 12 | 8.51 | 141 | 100.00 |
| Development of adequate contingency plans | 21 | 14.89 | 34 | 24.11 | 35 | 24.82 | 36 | 25.53 | 15 | 10.64 | 141 | 100.00 |
| KRI system developing for monitoring risk exposure and ensure it is coherent with KPIs and firm strategy, inclusive with correction and escalation plans if risks exceed the limits | 33 | 23.40 | 36 | 25.53 | 39 | 27.66 | 25 | 17.73 | 8 | 5.67 | 141 | 100.00 |
| Existence of a periodic risk-reporting system | 10 | 7.09 | 67 | 47.52 | 28 | 19.86 | 30 | 21.28 | 6 | 4.26 | 141 | 100.00 |
| Properly using the technology as an aid to support risk management activities | 45 | 31.91 | 23 | 16.31 | 24 | 17.02 | 30 | 21.28 | 19 | 13.48 | 141 | 100.00 |

Source: Authors

Almost half of the companies (47.52%) report annually, while 25.53% stated that reporting is quarterly or more often. 10.64% of companies assessed that they prepare plans for crisis situations, while 5.67% of them significantly or completely tested recovery plans to ensure the operation of key operations in crisis situations. The third segment, which includes the components of the organizational structure, clearly indicates the worst ratings compared to the previous two analyzed segments. Thus, 74.47% of companies from the sample stated that they do not have an appointed chief risk manager. Only 14.18% stated that they have had a chief risk manager for more than three years, while 3.54% of companies stated that he is in the process of being selected. 17.03% of companies stated that they have had a dedicated function/department in charge of risk management for more than a year, while almost two thirds of companies (65.96%) do not have a separate systematized function of the risk department.

Table 4. Responses per component – Organisational structure

| Components | 1 – not at all | | 2 - minimal | | 3 - partially | | 4 - significant | | 5 - completely | | Total | |
|--|----------------|-------|-------------|-------|---------------|-------|-----------------|-------|----------------|-------|-------|--------|
| | N | % | N | % | N | % | N | % | N | % | N | % |
| Appointment of a CRO | 105 | 74.47 | 5 | 3.55 | 10 | 7.09 | 1 | 0.71 | 20 | 14.18 | 141 | 100.00 |
| Building a dedicated RM function | 93 | 65.96 | 24 | 17.02 | 4 | 2.84 | 3 | 2.13 | 17 | 12.06 | 141 | 100.00 |
| Designation of a RM group or team to support CRO's job | 114 | 80.85 | 10 | 7.09 | 5 | 3.55 | 2 | 1.42 | 10 | 7.09 | 141 | 100.00 |
| Independence of RM function (direct reporting of CRO to board or to CEO) | 95 | 67.38 | 12 | 8.51 | 13 | 9.22 | 12 | 8.51 | 9 | 6.38 | 141 | 100.00 |
| Identifying risk owners responsible for the identification and management of each risk | 23 | 16.31 | 63 | 44.68 | 14 | 9.93 | 12 | 8.51 | 29 | 20.57 | 141 | 100.00 |
| Defining and communicating of roles and responsibilities for the management of risks | 28 | 19.86 | 30 | 21.28 | 41 | 29.08 | 30 | 21.28 | 12 | 8.51 | 141 | 100.00 |
| Integration of the process of RM among all the business functions and unit | 32 | 22.70 | 33 | 23.40 | 33 | 23.40 | 24 | 17.02 | 19 | 13.48 | 141 | 100.00 |
| Involving all employees, at all levels, in RM process | 19 | 13.48 | 34 | 24.11 | 52 | 36.88 | 33 | 23.40 | 3 | 2.13 | 141 | 100.00 |

Source: Authors

80.85% of companies from the analysed sample confirmed that there are no groups or teams that support the work of the chief risk manager. Instead, 44.68% of the companies in the sample stated that risk identification is most often carried out by the accounting department, while 14 of them (9.93%) use internal audit departments for this. 29.08% stated that a separate risk management department or appointed process owners are responsible for this.

Regarding the determination of roles and responsibilities in the risk management process, 19.86% of companies declared that the roles and responsibilities in the risk management process were not clearly defined. Less than a third of the analyzed companies (29.79%) rated this component significantly or completely satisfied. Also, only 30.50% of companies indicated that the business processes in the company were identified and documented, while more than 46.10% of companies estimated that this process was not completed at all or was completed to a minimal extent. Only 2.12% of companies assessed that their employees are fully involved in risk management processes, and the largest percentage of companies, 36.88%, stated that they rated this component partially.

4. Discussion

The conducted research is filling the gap about the hitherto undefined concepts and methods of risk management in joint-stock companies in B&H, in the segments of risk management culture, development of organizational processes, and organizational structure. Surveys were collected directly from the highest top management and persons in charge of risk management.

Based on the conducted research, it was confirmed that companies in B&H do not have developed components of an integrated concept of risk management. The development of the components of the risk management culture, structure, and process indicate that B&H companies still predominantly rely on traditional risk management approaches, which is in line with the results of research from neighbouring countries.

Risk management models, in the absence of a risk management culture and a supporting structure, tend to rely more on components of the traditional approach to risk management. The identified findings, indicating the lack of risk management culture and well-developed organizational structures required for implementing an integrated risk management concept in B&H companies, align with research conducted in neighboring countries such as Croatia and Serbia by Sprčić et al. (2017) and Barjaktarović et al. (2017).

Furthermore, these findings align with the estimates of Hofstede Insights, which, within the framework of Hofstede's (1993) fourth dimension of national culture, assess Bosnia and Herzegovina very highly, with as many as 87 points, in terms of uncertainty avoidance. This indicates that as a nation, we are more inclined to let the future simply unfold, rather than attempting to control and manage it through specific methods and techniques. If we equate the future with risk, which is often the case, it can be interpreted that we are more prone to situations where risk simply occurs, instead of being actively managed and controlled.

The failure to effectively manage risk leads to perceiving it as a danger rather than an opportunity, which is

characteristic of the traditional risk management approach. Consequently, people tend to avoid risks and become intolerant of unconventional behavior and ideas. This cultural trait may contribute to the lack of a well-established risk management culture and a preference for traditional risk management methods in B&H companies.

It is indisputable that the results and findings will be beneficial not only to academics but also to all stakeholders. The research outcomes will enhance the understanding of risk management concepts and assist in identifying key factors. This will enable the implementation of corrective planning and organizational actions to improve risk management practices. The research outcomes are expected to contribute significantly to enhancing risk management practices and ultimately leading to better risk management outcomes for the organization and its stakeholders.

5. Conclusion

Our results indicate that companies in Bosnia and Herzegovina do not have developed components of an integrated risk management concept. The development of risk management culture, structure, and processes indicates that B&H companies still predominantly rely on traditional risk management approaches, and they are not following the global trend of implementing risk management standards. In line with findings from researchers in the region, particularly Croatia and Serbia, it is evident that companies in B&H lack a well-developed risk management culture and a supporting structure for implementing advanced risk management approaches.

As a limitation of the study, the sample size on which the research was conducted could be considered. Additionally, relying on only one methodological approach in the research, such as the questionnaire, could be an additional limitation of the study. Combining multiple different methods, such as interviews, case studies, or document analysis, could provide deeper insights and validation of the results. Furthermore, the research was conducted shortly before and during the COVID-19 coronavirus pandemic, so not all dimensions of risk regarding the COVID pandemic may have been covered. Additionally, in questionnaire-based research, there is always a risk of subjectivity from the respondents. There is a possibility that some responses from executive staff or individuals responsible for risk management may be subject to subjective assessments and unrealistic reports.

In a methodological sense, further research on the application of conceptual models of risk management can contribute through studies that will be based on the study of risk management of one sector or activity, that is, a comparison of two or at most three business areas. Research can cover not only companies organized in the form of joint-stock companies but also other forms of organizing business entities. Additionally, comparisons of risk management experiences between domestic and foreign companies are possible. Moreover, future risk management research can be conducted at the level of individual-specific companies through a case study approach, enabling a more detailed analysis of individual segments of organizational culture, risk management processes, and structures, along with recommendations for further improvement. By exploring these various avenues, researchers can gain deeper insights into the effectiveness and applicability of different risk management approaches in different organizational contexts and sectors.

References

- Banham, R. (2005). *Enterprising views of risk management*. Articles of Merit Award Program for Distinguished Contribution to Management Accounting, 14.
- Barjaktarović, L., Pindžo, R., Đulić, K., & Vjetrov, A. (2017). Implementation of the ERM concept in Serbia: Comparative analysis: Real sector and financial sector. *Bankarstvo*, 46(2), 50-67. <https://doi.org/10.5937/bankarstvo1702050b>
- Bognár, F., & Benedek, P. (2022). Multi-Method Risk Assessment Process for Sustainable Business—A compliance research Follow-up Case Study. *Acta Polytech. Hung.* <https://doi.org/10.12700/APH.20.4.2023.4.3>
- Carey, A. (2011). Effective Risk Management in Financial Institutions: The Turnbull Approach. *Balance Sheet*, 9(3), 24-27. <https://doi.org/10.1108/09657960110696014>
- Celona, J., Driver, J., & Hall, E. (2011). Value-driven ERM: Making ERM an engine for simultaneous value creation and value protection. *Journal of Healthcare Risk Management*, 30(4), 15-33. <https://doi.org/10.1002/jhrm.20065>
- Colin, C. (2018). *Enterprise Risk Management: Tools and Techniques for Effective Implementation*.
- Coso, I. I. (2004). Enterprise risk management-integrated framework. *Committee of Sponsoring Organizations of*

the Treadway Commission.

- De La Rosa, S. (2006). Cultivating the best board: CAEs need to be aware of the six key areas that contribute to board effectiveness. *Internal Auditor*, 63(4), 69-74. <https://doi.org/10.1109/emr.2009.5384050>
- Farrel, J. M., & Hoon, A. (2009). *What's your company Risk Culture*. National Association of Corporate Directors Directorship, 50-62.
- Farrell, M., & Gallagher, R. (2015). The valuation implications of enterprise risk management maturity. *Journal of Risk and Insurance*, 82(3), 625-657. <https://doi.org/10.1111/jori.12035>
- Fox, C. (2018). Understanding the New ISO and COSO Updates. *Risk Management*, 65(6), 4-7.
- Garratt, B. (2010). *The fish rots from the head: The crisis in our boardrooms: developing the crucial skills of the competent director*. Profile Books.
- Ghafoori, E., Mata, F., Lauren, N., Faulkner, N., & Tear, M. J. (2023). Measuring risk culture in finance: Development of a comprehensive measure. *Journal of Banking & Finance*, 148, 106720. <https://doi.org/10.1016/j.jbankfin.2022.106720>
- Harrington, S. E., Niehaus, G., & Risko, K. J. (2002). Enterprise risk management: the case of united grain growers. *Journal of Applied Corporate Finance*, 14(4), 71-81. <https://doi.org/10.1111/j.1745-6622.2002.tb00450.x>
- Hillson, D., & Murray-Webster, R. (2011). Using risk appetite and risk attitude to support appropriate risk-taking: a new taxonomy and model. *Journal of Project, Program & Portfolio Management*, 2(1), 29-46 <https://doi.org/10.4324/9781315263601>
- Hofstede, G. (1993). Cultural constraints in management theories. *Academy of Management Perspectives*, 7(1), 81-94. <https://doi.org/10.5465/ame.1993.9409142061>
- Hoyt, R. E., & Liebenberg, A. P. (2011). The value of enterprise risk management. *Journal of risk and insurance*, 78(4), 795-822. <https://doi.org/10.1111/j.1539-6975.2011.01413.x>
- Hutchins, G. (2018). *ISO 31000: 2018 Enterprise Risk Management*. Greg Hutchins.
- International Finance Corporation. (2012). World Bank Group. Standards on Risk Governance in Financial Institutions, 10(1). (Available at: IFC+Risk+Culture+Governance+Incentives+report.pdf, accessed: april 2019.)
- ISO 31000:2018 - Risk management — Guidelines
- Iwedi, M., Anderson, O. E., Barisua, P. S., & Zaagha, S. A. (2020). Enterprise risk management practice and shareholders value: evidence from selected quoted firms in Nigeria. *Green Finance*, 2(2), 197-211. <https://doi.org/10.3934/gf.2020011>
- J. R. S. Fraser & B. J. Simkins., (2010). Enterprise risk management. An Introduction and overview”, in Enterprise Risk Management: Today's Leading Research and Best Practices for Tomorrow's Executives, J. R. S. Fraser and B. <https://doi.org/10.1002/9781118267080.ch1>
- Jalal, A., AlBayati, F. S., & AlBuainain, N. R. (2011). Evaluating enterprise risk management (ERM); Bahrain financial Sectors as a case study. *International Business Research*, 4(3), 83. <https://doi.org/10.5539/ibr.v4n3p83>
- Jean-Jules, J., & Vicente, R. (2021). Rethinking the implementation of enterprise risk management (ERM) as a socio-technical challenge. *Journal of Risk Research*, 24(2), 247-266. <https://doi.org/10.1080/13669877.2020.1750462>
- Kanu, M. S. (2020). The Role of Risk Culture in Enterprise Risk Management Implementation. *International Journal of Business and Management*, 15(11). <https://doi.org/10.5539/ijbm.v15n11p13>
- Lai, F. W., & A Samad, F. (2010). *Enterprise risk management framework and the empirical determinants of its implementation*.
- Lai, F. W., & Shad, M. K. (2017). Economic Value Added Analysis for Enterprise Risk Management. *Global Business & Management Research*, 9. <https://doi.org/10.15405/epsbs.2018.07.02.75>
- Lam, J. (2001). The CRO is here to stay. *Risk Management*, 48(4), 16-16.
- Lechner, P., & Gatzert, N. (2018). Determinants and value of enterprise risk management: empirical evidence from Germany. *The European Journal of Finance*, 24(10), 867-887.

- <https://doi.org/10.1080/1351847x.2017.1347100>
- Liebenberg, A. P., & Hoyt, R. E. (2003). The determinants of enterprise risk management: Evidence from the appointment of chief risk officers. *Risk management and insurance review*, 6(1), 37-52.
<https://doi.org/10.1111/1098-1616.00019>
- Lundqvist, S. A. (2015). Why firms implement risk governance – Stepping beyond traditional risk management to enterprise risk management. *Journal of Accounting and Public Policy*, 34(5).
<https://doi.org/10.1016/j.jaccpubpol.2015.05.002>
- Malik, M. F., Zaman, M., & Buckby, S. (2020). Enterprise risk management and firm performance: Role of the risk committee. *Journal of Contemporary Accounting & Economics*, 16(1).
<https://doi.org/10.1016/j.jcae.2019.100178>
- Manas, N., & Setapa, M. (2021). *The practices of Enterprise Risk Management (ERM) in Small and Medium Enterprises (SMES)—A literature review*.
- Metwally, A. B. M., & Diab, A. (2022). An institutional analysis of the risk management process during the COVID-19 pandemic: evidence from an emerging market. *Journal of Accounting & Organizational Change*, Vol. ahead-of-print No. ahead-of-print. <https://doi.org/10.1108/JAOC-03-2021-0043>
- Moeller, R. R. (2007). *COSO enterprise risk management: understanding the new integrated ERM framework*. John Wiley & Sons.
- Monda, B., & Giorgino, M. (2013, April). An ERM maturity model. In *Enterprise Risk Management Symposium. Chicago, IL, IL: Management, Economics and Industrial Engineering Department*.
<https://doi.org/10.2139/ssrn.2198944>
- Ng, T. H., Chong, L. L., & Ismail, H. (2013). Is the risk management committee only a procedural compliance? An insight into managing risk taking among insurance companies in Malaysia. *The Journal of Risk Finance. Norrisu* (1992) i Simon et al. (1997). <https://doi.org/10.1108/15265941311288112>
- Prewett, K., & Terry, A. (2018). COSO's Updated Enterprise Risk Management Framework—A Quest For Depth And Clarity. *Journal of Corporate Accounting & Finance*, 29(3), 16-23. <https://doi.org/10.1002/jcaf.22346>
- Protiviti (2011). Should the board have a separate risk committee? (Available at <https://www.protiviti.com/US-en/insights/bpro-issue-72> , Accessed: June 2023.
- Rampini, G. H. S., Takia, H., & Berssaneti, F. T. (2019). Critical success factors of risk management with the advent of ISO 31000 2018-Descriptive and content analyzes. *Procedia Manufacturing*, 39, 894-903.
<https://doi.org/10.1016/j.promfg.2020.01.400>
- Richter, C. (2014). *Development of a risk culture intensity index to evaluate the financial market in Germany*. In Proceedings of FIKUSZ'14 Symposium for Young Researcher (pp. 237-248).
- Risk Management Association. (2013). Risk culture: From theory to evolving practice. *RMA Journal*, 96(4), 24-26.
- Rizal, Y. S., & DP, A. H. (2022). The Improvement Of Company Performance Through Risk Management Process, Personnel Capability And The Application Of Tqm (Case Study: Lubricant Manufacturing Company PT X). *Dinasti International Journal of Education Management And Social Science*, 3(4), 577-586. <https://doi.org/10.31933/dijemss.v3i4.1182>
- Rodriguez, E., & Edwards, J. S. (2009). Applying knowledge management to enterprise risk management: Is there any value in using KM for ERM? *Journal of Risk Management in Financial Institutions*, 2(4), 427-437.
- Rubino, M. (2018). A comparison of the main ERM frameworks: how limitations and weaknesses can be overcome implementing IT governance. *International Journal of Business and Management*, 13(12), 203-214. <https://doi.org/10.5539/ijbm.v13n12p203>
- Simon, T. W. (2000). In defense of risk assessment: A reply to the environmental justice movement's critique. *Human and Ecological Risk Assessment*, 6(4), 555-560.
<https://doi.org/10.1080/10807030008951329>
- Simona, D. A., & Cristian, D. (2018). Enterprise risk management—Benefits of ISO 31000: 2018. *Revista OEconomica*, (03-4).
- Simona-Iulia, C. (2014). Comparative study between traditional and enterprise risk management—a theoretical

- approach. *Annals of the University of Oradea*, 23(1), 276-282.
- Sprcic, D. M., Pecina, E., & Orsag, S. (2017). Enterprise risk management practices in listed Croatian companies. *UTMS Journal of Economics*, 8(3), 219-230. [https://doi.org/10.1016/s2212-5671\(15\)01326-x](https://doi.org/10.1016/s2212-5671(15)01326-x)
- Standard & Poor's (S&P), 2005, Criteria, Insurance, General: Evaluating the Enterprise Risk Management Practices of Insurance Companies, www.standardandpoors.com, accessed: 12/01/2022.
- Standard & Poor's (S&P), 2013, Criteria, Insurance, General: Enterprise Risk Management. www.standardandpoors.com, accessed: 12/01/2022
- Stjepić, A. M., Pejić Bach, M., & Bosilj Vukšić, V. (2021). Exploring risks in the adoption of business intelligence in SMEs using the TOE framework. *Journal of Risk and Financial Management*, 14(2), 58. <https://doi.org/10.3390/jrfm14020058>
- Tan, C., & Lee, S. Z. (2021). Adoption of enterprise risk management (ERM) in small and medium-sized enterprises: evidence from Malaysia. *Journal of Accounting & Organizational Change*. <https://doi.org/10.1108/jaoc-11-2020-0181>
- Viscelli, T. R., Beasley, M. S., & Hermanson, D. R. (2016). Research insights about risk governance: Implications from a review of ERM research. *Sage Open*, 6(4), 2158244016680230. <https://doi.org/10.1177/2158244016680230>
- Viscelli, T. R., Hermanson, D. R., & Beasley, M. S. (2017). The integration of ERM and strategy: Implications for corporate governance. *Accounting Horizons*, 31(2), 69-82. <https://doi.org/10.2308/acch-51692>
- Yaraghi, N., & Langhe, R. G. (2011). Critical success factors for risk management systems. *Journal of Risk Research*, 14(5), 551-581. <https://doi.org/10.1080/13669877.2010.547253>
- Zhao, X., Hwang, B. G., & Low, S. P. (2013). Developing fuzzy enterprise risk management maturity model for construction firms. *Journal of construction engineering and management*, 139(9), 1179-1189. [https://doi.org/10.1061/\(asce\)co.1943-7862.0000712](https://doi.org/10.1061/(asce)co.1943-7862.0000712)
- Zheng, W., Yang, B., & McLean, G. N. (2010). Linking organizational culture, structure, strategy, and organizational effectiveness: Mediating role of knowledge management. *Journal of Business research*, 63(7), 763-771. <https://doi.org/10.1016/j.jbusres.2009.06.005>
- Zhu, D., Li, Z., & Mishra, A. R. (2023). Evaluation of the critical success factors of dynamic enterprise risk management in manufacturing SMEs using an integrated fuzzy decision-making model. *Technological Forecasting and Social Change*, 186, 122137. <https://doi.org/10.1016/j.techfore.2022.122137>

Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).