A literature review of systemic risk management and the role of stakeholders[1]

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Abstract

Frame of the research: *This study examines the relationship between non-financial risk governance, stakeholders, and management controls, employing a literature review and fuzzy-set qualitative comparative analysis (fsQCA). The findings indicate which configurations of controls and stakeholder involvement are necessary or sufficient for effective risk management, highlighting the pivotal role of stakeholders.*

Purpose of the paper: *This paper explores the relationship between non-financial risk governance, the role of stakeholders, and management control objects. It aims to fill a gap in the literature by investigating how specific configurations of controls and stakeholder engagement contribute to systemic risk governance.*

Methodology*: This study conducted a literature review combined with a fuzzy set qualitative comparative analysis (fsQCA) to examine and identify which management controls should be adopted to address various aspects of systemic risk management. This study also investigated stakeholder engagement in risk management processes. The fsQCA method was chosen for its ability to detect complex and non-linear relationships. A detailed calibration and validation process was followed to ensure methodological robustness.*

Findings*: The findings indicate that certain risk components are discussed more frequently in the literature than others. Management controls are highlighted as essential tools for intervening in and mitigating risks, and stakeholders are shown to play a critical role in all stages of risk management. Analysis revealed which combinations of controls are sufficient or necessary across the different phases of the risk management process.*

Research limitations: *This study is based on a theoretical framework suggesting that future research should include empirical investigations to explore the role of stakeholders in non-financial risk management. Moreover, the context-specific nature of fsQCA and the reliance on theoretical calibration introduce some limitations regarding generalisability.*

Practical implications: *This study identifies the relationships between management controls and risk management phases, emphasising the critical role of stakeholders in non-financial risk management. The proposed framework can help companies identify the necessary actions to manage all stages of risk management and determine the most strategically important stakeholders, who require greater*

involvement in this process. Organisations can use the configurational insights provided by this study to design more resilient and inclusive risk governance systems.

Originality of the paper: *This paper is original in its approach, as it synthesizes literature on non-financial risk governance and stakeholder engagement, and subsequently applies fsQCA to determine the necessary and sufficient elements that shape systemic risk management. To the best of our knowledge, this is one of the first studies to apply fsQCA to a literature-based dataset in the context of non-financial systemic risk, thereby offering a novel methodological contribution.*

Key words: *Systemic view of risk; stakeholder engagement; literature review; fsQCA*

1. Introduction

Managing risk means taking responsibility for one's choices by developing effective strategies to prevent, control, and mitigate risks and their effects (Miller *et al.*, 2008). Managing risks also means having tools or technologies available that allow for the intervention in and reduction of risks (Miller *et al.*, 2008) when unexpected events occur (Chenhall, 2003). The COVID-19 pandemic is just one example of an extraordinary event that affected organisations around the world. Unexpected events like the COVID-19 pandemic highlight the importance of considering risk analysis, management, and control-that is, governance, from a systemic (Martins *et al.*, 2022) and multidimensional perspective-to identify how and with what processes businesses manage and control these risks. The COVID-19 pandemic has altered the world of employment. In 2020, there was an increase of 24.7 million in unemployment (ILO, 2021), a reduction of 4.4% in global GDP, and significant changes in global trade relations and supply chains (Guan *et al.*, 2020; Linton and Vakil, 2020). Risks affect organisations and represent significant sources of crisis (Bundy *et al.*, 2017; Lampel *et al.*, 2009). Risks include climate change (Pinkse and Gasbarro, 2019; Weinhofer and Hoffmann, 2008) and related natural disasters (Baker, 2014; Battaglia *et al.*, 2019; Sargiacomo, 2014), as well as the social risks of human rights violations and occupational safety (EU-OHSA, 2010; Graetz and Franks, 2013; Passetti *et al.*, 2020). For instance, regarding the phenomenon of climate change, in 2017, the concentration of CO2 in the atmosphere reached 146%, the highest since the preindustrial era (UNEP, 2020). All of these events can have an impact on companies in terms of business interruption, administrative sanctions, and conflicts with stakeholders, producing negative repercussions on competitiveness and a reduced ability to create value (Bundy *et al.*, 2017). To respond to these issues, risk management and control systems (RMCS) can act as facilitating factors capable of preventing and reducing these negative effects (Chenhall, 2003; Mouritsen *et al.*, 2022; Passetti *et al.*, 2021; Sargiacomo *et al.*, 2014).

Based on the foregoing, this study undertook a literature review (Arshed and Danson, 2015; Huff, 2009) and fuzzy set qualitative comparative analysis (fsQCA) (Ragin, 2000, 2008, 2009) to deepen our understanding of relevant management and control systems (MCS) and

how they emerge in risk management, prevention, and control; that is, this study sought to identify what types of internal business controls, if any, influence the configurations of risk management practices to enable a systemic approach to risk governance. The concept of risk governance adopted in this study refers to a holistic and systemic perspective on risk (Miller *et al.*, 2008; Tryhuba *et al.*, 2022) in which the role of stakeholders cannot be ignored; thus, organisations should continually identify, manage, and communicate risks to key stakeholders during the different phases of crisis management (Ndlela, 2018; Xia *et al.*, 2018). In particular, this study focuses on systemic risk governance by considering the four components of the risk management process (Institute of Risk Management [IRM], 2002): risk assessment, risk reporting, risk treatment, and risk monitoring. Regarding controls, the objects of control adopted are those identified by Merchant and Van der Stede (2012): action controls, result controls, personnel controls, and cultural controls. The objects of control describe the contribution of a proactive management control system to the likelihood that the organisation's objectives will be achieved, given that the primary function of management control is to influence behaviour in desirable ways. These objects of control are used to analyse each risk management process component. From a methodological point of view, a two-step research approach was developed.

First, we carried out an updated review of the literature (Arshed and Danson, 2015; Huff, 2009) on risk governance and stakeholder engagement. This review process involved selecting papers that considered stakeholders relevant subjects in risk management and control so that we could outline a profile of a systemic business risk process. Second, we analysed the selected papers based on the object-of-control framework proposed by Merchant and Van der Stede (2012), classifying them based on both risk management phases and the types of control that were adopted. Finally, we carried out an fsQCA (Ragin, 2000, 2008, 2009) of the literature review to define the necessary and sufficient elements that shape the configurations of systemic risk management based on the responses of businesses in terms of controls adopted for non-financial risks. The decision to use fsQCA in this study is justified by the complexity and configurational nature of systemic risk governance. Specifically, fsQCA enables the identification of conditions that are minimally necessary and/or sufficient to achieve desired outcomes (Ragin, 2008; Ragin, 2009). Unlike traditional linear methodologies, fsQCA is particularly effective in capturing asymmetric and non-linear causal relationships, which are common in complex managerial environments such as systemic risk management (Meyer *et al.*, 1993; Fiss, 2011). Applying fsQCA allowed this study to explore multiple simultaneous conditions that influence effective risk governance, thereby overcoming the limitations of methods that assume uniformity or linearity in causal processes.

Results show that the literature tends to concentrate resources on specific risk mitigation phases (Leopoulos *et al.*, 2004). Through fsQCA, we observed that, according to the literature, the risk mitigation and assessment phases have the greatest impact on the control dimension (Gond *et al.*, 2012), thus influencing risk management, although the academic impact is often indirect and mediated by other mechanisms. Furthermore, the results

show that stakeholders are taken into consideration in different phases of risk governance, although often superficially and marginally. Nonetheless, stakeholders play an important role because they influence business activities and contribute to identifying, managing, and communicating risk.

The remainder of this paper is organised as follows: Section 2 discusses the theoretical framework and the research methods; Section 3 reports the results of the literature review and the fsQCA; Section 4 discusses the results and implications; and Section 5 presents the conclusions, limitations, and future research directions.

2. Reference framework and research method

Managerial, organisational, and accounting studies use the concept of risk to denote the 'uncertainties and threats' to which the system is exposed (e.g., Nyberg and Wright, 2016). Starting from the work of Knight (1921), this literature conceptualises risks as choices and situations that affect the organisational system itself. Risk governance involves a set of models, practices, and tools that allow the identification of any future situations and their severity, frequency, and probability of occurrence, making them visible, calculable, controllable, and, consequently, manageable (Miller *et al.*, 2008). In the context of business and organisations, risk analysis and management have grown in relevance in the last 15 years due to an increase in the number of factors that influence the choices and methods of the organisation of business and society (Gephart *et al.*, 2009). Initially, the concept of risk largely focused on the financial dimension (De Goede, 2004). Subsequently, the need emerged to move beyond the financial perspective and embrace a broader vision to guide business and organisational choices (Whiteman and Williams, 2019). In recent years, different types of risks have emerged, such as environmental (Keverne and Binder, 2020), social, technological, and industrial risks (Hardy and Maguire, 2016). Many companies suffer from environmental pollution caused, for example, by organisational operations (Maguire and Hardy, 2013) or catastrophic events (Matilal and Höpfl, 2009). Furthermore, the scale of environmental risks has shifted from specific local threats to those that have a global impact (Rockström *et al.*, 2009; Whiteman *et al.*, 2013).

As Gephart *et al.* (2009) have stressed, we live in a risk-based society, and the organisational risk calculation processes previously used in modern society do not work anymore because the risks are no longer localised and are long-term. The close interconnection and growing interdependence between social, technological, economic, and environmental dynamics stimulate an integrated approach to risk governance. To respond to systemic risks, it is necessary to promote integrated solutions. As Bebbington and Larrinaga (2014) and Markard *et al.* (2012) have argued, effective risk analysis and management require adopting a systemic perspective that captures the interconnections among various issues to promote more sustainable business practices and societal outcomes. Embracing a systemic view enables the development of more resilient and sustainable

solutions. Crucially, achieving such a perspective involves recognising the role of stakeholders in the risk assessment process (Tryhuba *et al.*, 2022). The increasing complexity of modern risks presents a significant challenge that demands a comprehensive, integrated response-one that actively engages stakeholders throughout all phases of the risk management cycle. Traditionally, literature on risk governance primarily focused on technical aspects (Miller *et al.*, 2008; Bundy *et al.*, 2017). However, scholars such as Kujala *et al.* (2022), in line with Freeman's stakeholder theory (Freeman, 1984; Donaldson and Preston, 1995), have highlighted that stakeholders are not merely passive recipients of risk information but active participants in shaping the risk management process.

In this study, we explore this perspective by examining how the role of stakeholders is framed across the various stages of risk, including management, analysis, communication, and measurement. This approach fosters a more comprehensive understanding of risk, acknowledging the interconnectedness between a company's operational strategies and the broader social, economic, and environmental systems in which it operates. Stakeholders play a fundamental role in the company as they can influence the achievement of the organisation's objectives (Freeman, 1984, p. 46; Noland and Phillips, 2010). Therefore, the task of management is to co-ordinate the expectations and needs of the various interest groups (Eesley and Lenox, 2006; Harrison *et al.*, 2010). This information, in turn, can stimulate innovation and enable the company to better cope with changes in the environment (Harrison *et al.*, 2010) and possible risks. Girard and Sobczak (2012) defined stakeholder engagement as a set of learning activities involving 'the creation and dissemination of trust, knowledge, and values, to build a base of social capital' (p. 217). While acknowledging that various definitions of stakeholder engagement exist in the literature, the proposed definition is intended to represent a useful extension of the previous definitions by making explicit the importance of the link between stakeholder engagement (Mitchell *et al.*, 2020) and risk management and control from a systemic point of view. Integrated risk and stakeholder engagement can promote the effectiveness of both risk management and stakeholder engagement (Xia *et al.*, 2018).

Based on the foregoing, this study aimed to identify what types of internal business controls, if any, influence the configurations of risk management practices to enable a systemic approach to risk management, that is, an approach that already includes and can foster virtuous and inclusive processes of stakeholder engagement (Zoritza *et al.*, 2022).

Therefore, our research question is:

What types of internal business controls influence the configurations of risk management practices to foster a systemic approach that integrates virtuous and inclusive stakeholder engagement processes?

Internal MCS can prevent, measure, and reduce the negative effects of risks, as widely stressed in the existing literature (Chenhall, 2003; Mouritsen *et al.*, 2022; Passetti *et al.*, 2021; Sargiacomo *et al.*, 2014). Nevertheless, the literature has not focused on the outlined systemic perspective of risks, in which stakeholders have a role, and has yet to assess the types of controls that play as enablers in risk management and control. To fill this gap, we

adopted Merchant and Van der Stede's (2012) object-of-control framework. This framework considers four types of controls (i.e. action, results, personnel, and cultural) and enables a comprehensive understanding of the management controls that an organisation can mobilise in response to organisational risks (Passetti *et al.*, 2020, 2021; Van der Kolk *et al.*, 2020).

We used the literature review method (Arshed and Danson, 2015; Huff, 2009). We selected papers from Scopus and Web of Science, which are considered the two most prestigious academic databases (Wang and Waltman, 2015) to search for scientific articles (Buzzao and Rizzi, 2020). We only considered articles written in English (Ansari and Kant, 2017; Daddi *et al.*, 2018) and published in the last 25 years, that is, from 2000 to 2025. Furthermore, we considered the 'business', 'management', and 'accounting' research areas in Scopus and the 'management' area in Web of Science. We used the results from the literature review for an fsQCA (Ragin, 2000, 2008, 2009) to investigate which elements of controls could be considered the main drivers explaining systemic risk management and the role of stakeholders.

Reading the literature is essential to define a complete and extensive picture of the influence of stakeholders in the risk treatment phases. The review was non-systematic (Arshed and Danson, 2015), and the choice of keywords to include in the algorithm did not follow a standard process, such as that required by systematic literature reviews (Xiao and Watson, 2017). Operatively, we reviewed the literature through the components of the risk management process described by the IRM (2002), integrated with the role covered by stakeholders. We then adopted the object-of-control framework (Merchant and Van der Stede, 2012) to interpret the four components of the risk management process and identify how these controls act over risk governance. In this way, we analysed risk management from a systemic perspective while considering the role of stakeholders.

The components of the risk management process (IRM, 2002) are risk assessment (risk analysis and evaluation), risk reporting, risk treatment, and risk monitoring (IRM, 2002, p. 4; Palermo, 2017).

Risk assessment aims at identifying, describing, and estimating risks. Risk reporting is concerned with communication at different organisational levels (i.e. board, business units, individuals, external stakeholders) of information about the risk management process. Risk treatment is the process of selecting and implementing measures to address risks (e.g. risk transfer, avoidance). Finally, the monitoring process should provide assurance that there are appropriate controls in place and that procedures are understood and respected (Palermo, 2017).

The systematic management of risk requires companies to implement proactive control over all desired choices and to anticipate overcoming and reducing the negative effects of unexpected events. The Merchant and Van der Stede (2012) model refers to management control within the company. It consists of four types of controls: action controls, result controls, personnel controls, and cultural controls. Action controls are the most direct form of management control because they involve steps to ensure that one is acting in the best interest of the organisation. Examples of actional control techniques include the operational and managerial

procedures and manuals adopted by the organisation (formalised knowledge) and the definition of managerial roles and responsibilities within the organisation. Result controls are an indirect form of control because they do not explicitly focus on actions but on the results obtained. Examples include performance monitoring systems about budget or internal non-financial measures, such as the number of accidents at work, product quality levels, and customer satisfaction levels. Personnel controls are indirect controls based on the fulfilment of job requirements and alignment with organisational requisites. Examples include training programmes, job design and worker selection procedures, and motivational systems and systems that provide recognition of personnel. Finally, cultural controls refer to indirect controls based on internal shared values, social norms, and beliefs. Examples include codes of conduct, ethics, and value principles. This framework enables a comprehensive understanding of the management controls that an organisation can mobilise to understand how to manage risk from a systemic view. Merchant and Van der Stede's (2012) model has been widely used in the literature as it has provided important theoretical and empirical insights into the various organisational dynamics and management controls (Passetti *et al.*, 2021; Passetti *et al.*, 2020; Van der Kolk *et al.*, 2020; Velez *et al.*, 2008).

Based on the components of the risk management process (IRM, 2002), we analysed the phases of risk management from a systemic perspective (Table 1).

Tab. 1: Matrix of risk categories and control actions considering the 'stakeholder dimension'

Stakeholder engagement (Ref. Freeman, 1984; Noland and Phillips, 2010)		Objects of control (Ref. Merchant and Van der Stede, 2012)			
		Action controls	Result controls	Personnel controls	Cultural controls
Systemic risk management components (Ref. IRM, 2002; Palermo, 2007)	Risk assessment (risk analysis and evaluation)				
	Risk reporting				
	Risk treatment (risk management and control)				
	Risk monitoring				

Source: Authors' elaboration

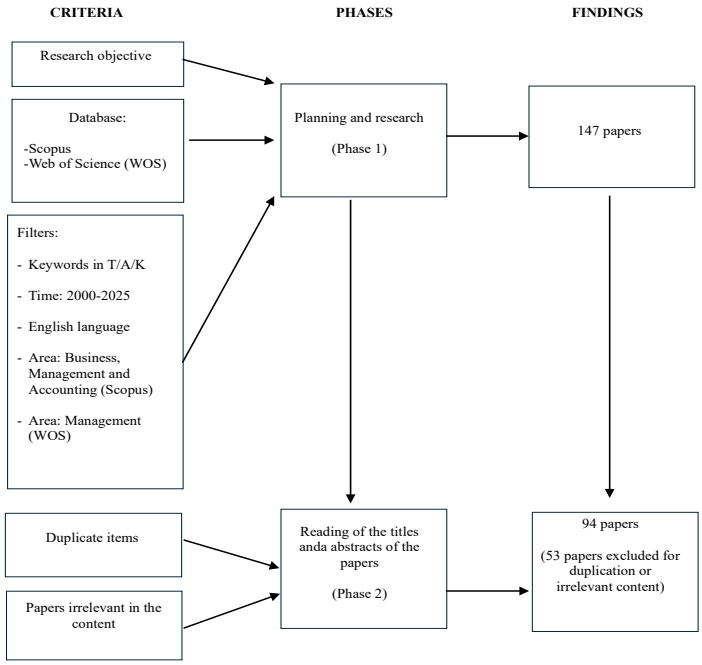
The matrix incorporates the components of the risk management process (IRM, 2002) along with stakeholder engagement (Freeman, 1984) on the one side, and the objects of control (Merchant and Van der Stede, 2012) on the other. This approach allows us to systematically assess risk by considering all control actions throughout the phases of risk management.

To carry out our analysis, we used the keywords derived from the intersection of the risk management process components, integrated with stakeholder engagement, and the objects of control. Consequently, the keywords identified in the title, abstract, or papers' keywords were risk

management AND compan* AND stakeholder and the combination of the categories described in the matrix (Table 1), risk analysis and evaluation AND action control, risk analysis and evaluation AND result control, risk analysis and evaluation AND personnel control, risk analysis and evaluation AND cultural control, risk reporting AND action control, risk reporting AND result control, risk reporting AND personnel control, risk reporting AND cultural control, risk treatment AND action control, risk treatment AND result control, risk treatment AND personnel control, risk treatment AND cultural control, risk monitoring AND action control, risk monitoring AND result control, risk monitoring AND personnel control, and risk monitoring AND cultural control.

This keyword search generated an initial pool of 147 articles. After reviewing the titles and abstracts, we excluded 53 articles that were deemed irrelevant. We then analysed the remaining 94 articles and entered them into the matrix. The process of collecting and analysing the papers began in September 2022 and ended in March 2025. The research methodology is depicted in Figure 1.

Fig. 1: Stages of the literature review



Source: Authors' elaboration

This study utilised fsQCA to investigate the various simultaneous conditions that affect effective risk governance. This approach addresses the shortcomings of methods that rely on uniformity or linearity in causal processes (Ragin, 2000, 2008, 2009). The analysis aimed to determine whether the configurations identified in the literature indicate specific relationships between management controls and risk management.

FsQCA is a configurational comparative method grounded in set theory and fuzzy logic, enabling the nuanced examination of how various configurations of conditions lead to specific outcomes (Ragin, 2008, 2009). By simultaneously employing qualitative and quantitative approaches (Ragin, 2009), fsQCA uncovers which combinations of factors are minimally necessary or sufficient to achieve desired results, facilitating the classification of case groups sharing particular condition sets (Meyer *et al.*, 1993; Skarmeas *et al.*, 2014).

Configurations in fsQCA consist of multiple conditions or factors, which can be positively present, negatively present, or entirely absent. A condition is necessary if a particular outcome cannot occur without it, and it is sufficient if it alone can produce the outcome without additional conditions (Ragin, 2008). This method is particularly suited to investigating complex causal relationships, including causal asymmetry and combined effects, that traditional methodologies may overlook (Fiss, 2011; Gligor and Bozkurt, 2020; Kumar *et al.*, 2022; Llopis-Albert *et al.*, 2018; Rihoux, 2006). Furthermore, fsQCA can handle conjunctive causality, where the necessity or sufficiency of conditions depends on their combination with others, and equifinal causality, where different configurations yield the same outcome (Fiss, 2011).

FsQCA bridges quantitative and qualitative analysis by clarifying complexities at the individual case level and identifying overarching patterns across cases (Aguilera-Caracuel *et al.*, 2014; Crilly, 2011). This approach enhances comprehension by identifying pertinent factors influencing desired outcomes and outlining how factors synergistically integrate, thereby illuminating causal complexities (Chang and Cheng, 2014; Fiss, 2011).

The operationalisation of variable values begins with calibration, assigning fuzzy membership scores that quantify the conformity of cases to predefined sets (Ragin, 2008). These fuzzy membership scores range from 0 (full non-membership) to 1 (full membership), with anchor points for full membership, full non-membership, and a crossover point of maximum ambiguity clearly defined (Kent, 2005; Ragin, 2008).

Following calibration, fsQCA generates a truth table-a matrix of 2^k rows (where k is the number of conditions)-depicting all logically possible configurations of causal conditions and their complements. Each case is categorised according to these configurations (Ragin, 2008; Woodside and Baxter, 2013). Subsequently, the Quine-McCluskey algorithm reduces the truth table into simplified configurations minimally sufficient for achieving outcomes based on the frequency and consistency thresholds (Chang and Cheng, 2014; Quine, 1952; Ragin, 2008, 2009).

Consistency and coverage measure solution quality (Ragin, 2008). Consistency quantifies how reliably instances with similar conditions yield the same outcome, while coverage measures the empirical relevance of solutions. Specifically, conditions are deemed necessary if their consistency is ≥ 0.9 and sufficient if their consistency is ≥ 0.75 (Schneider and Wagemann, 2010). Raw coverage indicates the proportion of outcomes explained by a specific configuration, whereas unique coverage shows the proportion explained exclusively by that configuration (Ragin, 2008).

In our analysis of different risk management components, we identified conditions under which specific management controls contributed to process phases, distinguishing between strictly necessary and sufficient control types.

3. Findings

3.1 Results of the literature review

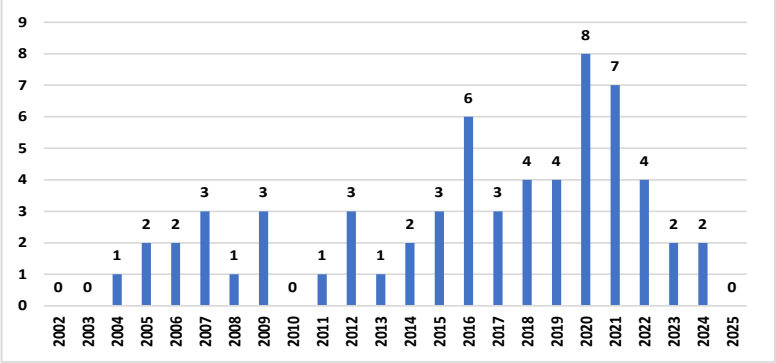
We inserted the articles resulting from the review process into the matrix (Table 2). The matrix revealed the phases of the risk process that were considered in the literature. A total of 33% of the articles were focused on risk treatment, 27% on reporting, 22% on risk assessment, and 18% on monitoring. We report the distribution per year of publications in Figure 2, which shows an oscillating trend, with the highest peaks in 2020 and 2021. Analysis revealed that 33% of the articles were published in the last three years. The synthetic content of the articles is reported in Annex 1.

Tab. 2: Matrix of articles that consider risk categories and stakeholders

Stakeholder engagement (Ref. Freeman, 1984; Noland and Phillips, 2010)		Objects of control (Ref. Merchant and Van der Stede, 2012)			
		Action controls	Result controls	Personnel controls	Cultural controls
Systemic risk management components (Ref. IRM, 2002; Palermo, 2007)	Risk assessment (risk analysis and evaluation)	1	6	8	5
	Risk reporting	7	13	3	3
	Risk treatment (risk management and control)	5	22	2	3
	Risk monitoring	5	10	1	0

Source: Authors' elaboration

Fig. 2: Number of relevant documents published annually from 2000 to 2025



Source: Authors' elaboration

Risk assessment (risk analysis and evaluation)

Articles described risk assessment and analysis through indices or platforms (Testorelli and Verbano, 2020) to identify and qualify risks (Gogan, 2014; Lo *et al.*, 2021). Above all else, the articles described risk assessment in corporate projects (Popescu and Petruş, 2012; Testorelli and Verbano, 2020; Zafar *et al.*, 2019), the assessment of risks related to the supply chain (Hernandez and Haddud, 2018), credit risk (Lo *et al.*, 2020), and intellectual capital (Gogan, 2014).

Regarding the stakeholders, the articles in the risk assessment phase considered the employees and their level of qualifications because this can influence the success of a project. Poor employee skills can be a risk factor for a company, making it important to evaluate and manage necessary skills (Popescu and Petruş, 2012). Companies also consider the expectations and priorities of dominant stakeholders in an assessment of risks (Hernandez and Haddud 2018; Hsiao and Ploughman, 2009; Zafar *et al.*, 2019). This is essential to identify the critical areas to which attention should be paid, which can influence decision-making (Kapiriri and Razavi, 2021).

Taking into consideration the four types of controls (Merchant and Van der Stede, 2012), personnel controls play an important role. This aspect confirms the importance of the 'dependent' stakeholder in the risk analysis and assessment phase, their perception, and their training regarding the possibility of responding to the risks identified as most relevant. Indeed, the articles described the checks carried out on the innovation and production capacity (Lo *et al.*, 2021) of workers (Zafar *et al.*, 2019), their perceptions and expectations (Testorelli and Verbano, 2020), and their training based on the performance of their work activities (Hsiao and Ploughman, 2009). Moreover, the indicators and platforms (Gogan, 2014) adopted for risk assessment have a certain degree of importance. In this respect, six articles highlighted the importance of result controls as systems that allow support for the risk assessment process and verify the effectiveness of companies' management response tools (Hernandez and Haddud, 2018; Lo *et al.*, 2021). Therefore, the selection of adequate performance indicators associated with the possible risks emerges as relevant from the initial assessment phase. Furthermore, it guides the risk management, control, and measurement process even in the subsequent phases (see Table 2 and the following details).

Only one article described action controls. These checks have an 'operational' nature and thus have less significant weight in the initial assessment phase. The article described the controls implemented to avoid exceeding established deadlines for the implementation of specific projects for which the risk assessment was conducted (Zafar *et al.*, 2019).

Finally, cultural controls concern the establishment of shared values that influence workers' mentality and behaviour. These controls are based on the communication of values and the motivation of staff. They emerge in this risk assessment phase as a connection between the evaluation process and company management systems (Zafar *et al.*, 2019) through the measurement of the value created (Testorelli and Verbano, 2020) to prevent possible risks (Fotr *et al.*, 2015).

Risk reporting

These articles described risk reporting through the publication of voluntary reports (Al-Shaer *et al.*, 2022; Callaghan and Nehmer, 2009). Such reports disclose information regarding the risks borne by a company (Lakshan *et al.*, 2021). External disclosure is crucial to improve stakeholder satisfaction (Callaghan and Nehmer, 2009) and enable stakeholders to make more informed decisions (Baig *et al.*, 2024; Lakshan *et al.*, 2021; Xiaoxia and Minghui, 2023). In some cases, the same stakeholders ask companies to provide information on how they manage social and environmental issues and integrate sustainability considerations into their operations (Ahmed *et al.*, 2019).

Compared to objects of control, result controls have a significant role. Result controls concern the monitoring of management results and risk-related performances based on the adoption of adequate sustainability performance indicators (Ahmed *et al.*, 2019; Buniamin, 2020), which are communicated to the various stakeholders through reports (Al-Shaer *et al.*, 2022; Callaghan and Nehmer, 2009).

Action controls also have a certain degree of relevance, emerging in seven of the investigated reports. Companies aim to provide indications of their risk management methods as well as the procedures and practices (Bager and Lambin, 2020; Karwowski *et al.*, 2021) they adopted to prevent harmful events and reduce the probability of the unexpected occurring.

Few articles described personnel controls, although the issue of personnel involvement and training represents a crucial step for the correct implementation of risk management procedures (Buniamin, 2020). Similarly, few articles referred to cultural controls, although the identification of values and principles that guide business activity is considered important for directing the approach to corporate risk governance (Lakshan *et al.*, 2021). However, the communication of these issues did not emerge as a priority, and this type of control does not appear to have a significant influence on the risk reporting phase.

Risk treatment (risk management and control)

A large number of articles dealt with the topic of risk treatment. Some articles described how enterprises manage global risks along the value chain (Liu *et al.*, 2020; Wu *et al.*, 2021), while others described risk management in projects (Leopoulos *et al.*, 2004; Liu *et al.*, 2023; Wang *et al.*, 2022; Zhu *et al.*, 2020) and how risk management plays a fundamental role in achieving project success (Wang *et al.*, 2022). Several articles considered risk management in business performance (Abiodun Eniola, 2020; Mateescu *et al.*, 2017). Finally, some articles focused on the management of risks arising from sustainability issues, such as climate change, resource depletion, and natural disasters (Guimarães *et al.*, 2018; Kuruppu *et al.*, 2024; Manab and Aziz, 2019; Osland and Osland, 2007; Schaltegger *et al.*, 2015).

Different categories of stakeholders were reported, but suppliers, consumers, and workers emerged as the most relevant. By sharing risk with stakeholders, companies obtain both image and prevention advantages (Wang *et al.*, 2022). Firms that manage risks by considering stakeholder expectations increase stakeholder satisfaction (Prioteasa *et al.*, 2021) and

decrease negative impacts that can affect stakeholder relationships (Manab and Aziz, 2019; Pham, 2016).

Considering the four objects of control, the articles frequently considered result controls, while action controls were considered less frequently than expected. Performance controls concern the monitoring of the results achieved to manage risks, and are the main evidence of the effectiveness of management practices and actions that have been implemented. In particular, the articles described the checks carried out on the implementation status of the completed projects (Wang *et al.*, 2022; Zhu *et al.*, 2020), checks on their quality and the level of customer satisfaction (Wu *et al.*, 2021), and the controls carried out on management performance with specific indices (Guimarães *et al.*, 2018; Abiodun Eniola, 2020; Schaltegger, 2016; Arnold, 2015; Mateescu *et al.*, 2017).

Five articles described action controls. Action controls concern practices and procedures used for risk prevention and to identify the actions that should be taken to reduce the effects of events associated with critical occurrences (Bostan *et al.*, 2012; Guserl, 2016; Osland and Osland, 2007). These are central activities in the field of risk prevention and minimisation, which allow risk management to be concretely and operationally integrated into a company's business practices. However, the number of papers explicitly dealing with this topic was rather low, demonstrating an even greater tendency of research to focus on the measurement and control of results rather than on the tools and practices that can support those results.

As previously noted, few papers dealt with cultural controls, and even fewer described personnel controls as determinants of the risk treatment phase. Cultural controls concern codes and principles that guide corporate action and have the objective of influencing the behaviour of corporate employees in terms of risk prevention and management. The papers in this case concerned the reputational effects of value systems (Hirsch, 2017) and the existing relationships between cultural controls and the adoption of a company's integrated management system (Zeng *et al.*, 2007). Personnel controls concern the actions companies take to valorise and qualify human resources to achieve company objectives and manage risks (Borggraefe, 2016; Popescu and Petruş, 2012).

Risk monitoring

Only 16 papers in our review considered risk monitoring. Some of these articles described the monitoring of risks related to sustainability issues (Lueg *et al.*, 2015; Naidoo and Gasparatos, 2018; Schaltegger *et al.*, 2015), while others dealt with monitoring systems for risks related to intellectual capital (Parshakov, 2017). Although there were few papers related to this risk management phase, collaboration with stakeholders remains an element that can support companies in measuring the impact that potential risks can generate over time (Wu *et al.*, 2021).

Finally, in respect to the four objects of control, most articles considered controls on results while only a few articles addressed controls on actions. Once again, controls over results emerged as the main driver. The definition of structured performance indicators allows for the monitoring of actions and projects aimed at preventing critical events (Jin *et al.*, 2022;

Schaltegger *et al.*, 2015) and the maintenance of certain quality standards (Wu *et al.*, 2021). Five papers described the action controls that outline the operational methods with which the monitoring activity is developed as a function of risk reduction (Bostan *et al.*, 2012; f.i. Guserl, 2016), and one paper connected the training and qualification of staff to risk monitoring activities (Borggraefe, 2016). None of the articles considered cultural controls.

3.2 FsQCA results

The fsQCA methodology was chosen because it enables the identification of the sufficient and necessary conditions (i.e. types of controls) in the literature that are pertinent to the four components of the risk management process (IRM, 2002). FsQCA facilitates an understanding of which control components are relevant within each specific phase of risk management. This analysis supplemented what has been previously highlighted and aimed to uncover additional information. Based on findings from the literature, this analysis allowed for:

- Identifying the phases of risk management that are generally influenced by controls.
- Delineating the control objects most pertinent to each phase in which they are influential.

Our fsQCA was conducted in three steps (Ragin, 2008). Initially, we examined and defined the outcome measures and conditions. We then codified the cases and calibrated the membership set using the direct method (Kraus *et al.*, 2018; Woodside, 2013), resulting in three calibration anchors representing full membership (0.95), full non-membership (0.05), and the crossover point (0.5). Ultimately, we constructed the truth tables.

We utilised fsQCA 3.0 software (Ragin and Davey, 2016), with the objective of understanding the level of dependence of the outcomes (O1, O2, O3, O4) on the four input conditions, either necessarily or sufficiently (C1.1, C1.2, C1.3, C1.4-C2.1, C2.2, C2.3, C2.4-C3.1, C3.2, C3.3, C3.4-C4.1, C4.2, C4.3, C4.4). Table 3 summarises the outcomes and conditions considered in the fsQCA.

Tab. 3: Definition of outcomes and conditions for the fsQCA

Outcomes	Conditions
Risk assessment (O1)	Action controls (C1.1) Result controls (C1.2) Personnel controls (C1.3) Cultural controls (C1.4)
Risk reporting (O2)	Action controls (C2.1) Result controls (C2.2) Personnel controls (C2.3) Cultural controls (C2.4)
Risk treatment (O3)	Action controls (C3.1) Result controls (C3.2) Personnel controls (C3.3) Cultural controls (C3.4)
Risk monitoring (O4)	Action controls (C4.1) Result controls (C4.2) Personnel controls (C4.3) Cultural controls (C4.4)

Source: Authors' elaboration

We analysed each condition in terms of consistency and coverage. The results are presented in detail. Table 4 summarises the configurations analysed. Necessary conditions are indicated by a black circle (•); sufficient conditions are indicated by an open circle (°).

Tab. 4: Summary of the configurations of the literature

	Risk assessment (Outcome 1)	Risk reporting (Outcome 2)	Risk treatment (Outcome 3)	Risk monitoring (Outcome 4)
Action controls (IN 1.1)	°		°	
Result controls (IN 2.1)	°		°	
Personnel controls (IN 3.1)	°		°	
Cultural controls (IN 4.1)	°		°	
Raw coverage	0.526316	0.407895	0.526316	0.407895
Unique coverage	0.526316	0.407895	0.526316	0.407895
Consistency	1	1	1	1

Legend:
• Necessary condition
° Sufficient condition
Blank space: none of the previous

Source: Authors' elaboration

The results show that all of the controls examined are sufficient conditions for risk management in the assessment and treatment phases. These are the two phases in which the technical (Schaltegger and Burritt, 2005), organisational (Ahrens and Chapman, 2007; Brown and Duguid, 1991), and cognitive (Hoffman and Bazerman, 2007) aspects act more on the control dimension (Gond *et al.*, 2012), ultimately influencing risk management as well. Thus, it is not surprising that these phases play an important role in literature. Therefore, the risk assessment and risk treatment phases for the management of non-financial risks are well supported by the totality of controls that can be adopted within the company. Although not strictly necessary, the presence of all such controls seems to allow a dynamic approach to the analysis and treatment of risks. All controls were found to be important, and it is precisely from their integrated adoption that adequate systems of identification, prevention, and response to possible crises can be obtained.

The monitoring and reporting aspects have a dominant technical component in business management and risk management as well. Through them, indicators are defined that allow performance to be monitored over time and stakeholders to be informed through adequate reporting processes. Nevertheless, these actions come after the phases of assessment and treatment, and do not present a direct connection with controls adopted by the organisation. From this point of view, the contribution of internal controls is not directly necessary or sufficient for reporting and monitoring initiatives, but emerges as a consequence of the importance of these controls in the assessment and treatment phases.

4. Discussion and implications

Through this literature review, we have illustrated the important role and influence of stakeholders in risk management, the integrated management of all risk phases, and the implementation of harmonised controls over the different phases.

Regarding the role of stakeholders, the articles highlighted the attention paid to stakeholders in the assessment, treatment, monitoring, and reporting of risk (Bostan *et al.*, 2012; Abiodun Eniola *et al.*, 2020; Guserl, 2016). This attention seems to improve the relationship an organisation has with stakeholders (Prioteasa *et al.*, 2020; Pham, 2016; Leopoulos *et al.*, 2004). Stakeholders considered by the articles primarily included customers, employees, investors, and suppliers, who can help the company identify and manage risks. There is a mutual influence between risk management and stakeholders. Managing risk improves an organisation's relationship with stakeholders (Prioteasa *et al.*, 2020; Pham, 2016; Leopoulos *et al.*, 2004) and collaboration with stakeholders can lead to learning, innovation, and business transformations (Sloan, 2009), reducing the occurrence of unexpected events. As stakeholder support makes an important contribution to organisational outcomes (Mateescu *et al.*, 2017), it is crucial to consider them in all risk management processes. Companies should consider stakeholders in the risk analysis process to respond to their expectations (Bager and Lambin, 2020). Stakeholders should be considered in the risk reporting phase to provide them with useful information (Lakshan *et al.*, 2021) and to improve relationships with them. Finally, they should be considered in risk management and monitoring because of the need to respond to stakeholder pressure and requests for risk reduction (Ahmed *et al.*, 2019). However, the articles showed that companies currently consider stakeholders in some phases of risk management but not in others. Companies should make an effort to integrate stakeholders across all phases in order to learn from stakeholders and improve risk management.

Based on the results of our research, many articles in the literature described the importance of each phase of risk management. What is missing is the company's use of all components of risk management in a systemic way, as well as consideration of the role of stakeholders and the controls on the risk phases. Regarding the risk identification and assessment phase, many articles in the literature have described its value and importance (e.g., Walker *et al.*, 2001). Others have pointed out that organisations use the risk assessment phase to provide sufficient means to reduce risks (Lo and Chen, 2012). Regarding the risk treatment and risk reporting phase, the literature describes the importance of developing one's culture and organisational processes to guarantee the reliability of risk reporting information (Oliveira *et al.*, 2013) and minimise the negative effects (Gander *et al.*, 2011) of unexpected events. Finally, in terms of the risk monitoring and control phases, the literature shows that they are often poorly implemented due to the lack of ability to monitor and manage the identified risks, causing significant losses (Obondi, 2022). Therefore, based on our review, all risk phases are fundamental, and companies cannot

underestimate them because risk management can significantly contribute to the survival of the company. Risk management can have an impact on the social status of all stakeholders involved (Fotr *et al.*, 2015). At the same time, stakeholders can influence risk management (Liu *et al.*, 2020) and thus the survival of the businesses (e.g., Barnett and Solomon, 2006).

Regarding controls, our study shows that companies do not systematically consider risk and risk management phase controls because they place more importance on specific risk phases. Companies can only effectively manage non-financial risks through the adoption of harmonised control systems.

The fsQCA results show the parsimonious relationships between conditions and outcomes. The results of the fsQCA, derived from the literature review, show that action controls, result controls, personnel controls, and cultural controls are sufficient for risk assessment and treatment. This interesting result shows that, according to fsQCA, controls are not necessary and sufficient for risk reporting and monitoring results, but it is sufficient that conditions exist for the assessment and treatment of risk. This result is linked to the nature of the risk management phases considered: risk assessment and treatment have a technical (Schaltegger and Burritt, 2005), organisational (Ahrens and Chapman, 2007; Brown and Duguid, 1991) and cognitive nature (Hoffman and Bazerman, 2007) and tend to act more on the control dimension (Gond *et al.*, 2012); whereas risk reporting and risk monitoring are technical in nature and are the effects of the correct implementation of controls over the other phases of risk management (Battaglia *et al.*, 2016; Lai *et al.*, 2014; Porac and Thomas, 2002).

Based on our analysis, management controls have a relevant role in supporting an organisation's response to risks. At the organisational level, management controls facilitate close internal co-ordination among staff members regarding the different risk management phases, and support the definition of the various operational practices capable of facilitating the response to emergencies. In the external dimension, control mechanisms can foster dialogue, trust, and opportunities to mitigate the impacts that may emerge from these risks.

From this perspective, the harmonious management of control systems gives visibility to the greater complexity generated from a crisis at all levels of controls-a result that is in line with previous literature highlighting the concomitant use of multiple control mechanisms to deal with unplanned situations (Bedford and Malmi, 2015; Passetti *et al.*, 2021; Rikhardsson *et al.*, 2021; Van der Kolk *et al.*, 2015). Indeed, the action controls allow rigorous and extraordinary operational co-ordination of health, safety, and prevention practices to minimise the occurrence of emergencies. However, this technical dimension should be integrated with the active participation of staff (skilled and empowered) who can manage critical situations with a sensitivity of governance and a set of values (cultural controls) aimed at guiding processes, detecting the needs of stakeholders, and responding to their expectations. Finally, the result controls enable the measurement of the effectiveness of what has been implemented, facilitating the correct identification of actions that can be implemented.

In short, companies should holistically manage risk to avoid unexpected adverse events under a system of controls based on organic rather than mechanistic approaches. They should also consider stakeholders at all stages of the risk management process, not sporadically or superficially.

This study provides significant contributions from both theoretical and managerial perspectives. Theoretically, it enhances the ongoing discussion on integrated risk governance by emphasising the importance of adopting a strategic agility perspective (McGrath, 2013)-highlighting the organisation's ability to rapidly adapt to changing conditions and emerging risks-while actively involving stakeholders throughout all phases of the risk management process. In this view, stakeholders are not only affected parties, but strategic allies whose engagement is crucial to ensure responsiveness, relevance, and resilience in an increasingly uncertain environment. Our updated literature review addresses a critical gap: while many studies focus on individual phases of risk management, a comprehensive approach that integrates the entire risk management cycle while considering the role of stakeholders is largely missing. By applying the object of control framework (Merchant and Van der Stede, 2012), this study identified theoretical configurations that link stakeholder engagement and the adoption of specific control mechanisms to corporate practices in managing non-financial risks.

The results revealed that the existing literature focuses on the risk management and control phase. Significantly, many contributions concentrate on a single phase of the risk management process, overlooking the integrated perspective across all phases to achieve truly effective and proactive risk management. Furthermore, stakeholders are recognised as essential actors whose engagement must evolve from operational involvement to a strategic partnership role, contributing actively to organisational learning, adaptability and risk anticipation. This theoretical fragmentation points to the need for more integrated approaches that recognise the interdependence of various phases of risk management and the evolving nature of stakeholder relationships.

From a managerial perspective, the results offer concrete implications for organisations. Companies are encouraged to adopt a holistic and cross-functional view of risk by integrating stakeholder contributions throughout the entire management cycle-from risk analysis and evaluation to treatment, communication, and monitoring. Customers, suppliers, employees, and investors can serve as valuable sources of knowledge, helping anticipate unforeseen events, thereby enhancing organisational resilience and improving adaptability to changing environments. Moreover, structured stakeholder engagement can promote organisational learning, innovation, and transformation, thereby supporting the long-term sustainability of business decisions. Companies are encouraged to adopt a holistic and agile view of risk, integrating stakeholder contributions throughout the entire management cycle as strategic resources capable of detecting weak signals, triggering innovation, and supporting long-term adaptability.

Another important managerial implication is the need to implement coherent and harmonised control systems across all stages of the risk management process. The lack of structured controls in critical phases, such

as monitoring and reporting, can undermine the overall effectiveness of risk governance. Therefore, companies need to establish integrated control mechanisms that support not only risk identification and assessment but also ongoing risk management and continuous stakeholder dialogue. Our analysis suggests that while companies may apply certain controls at specific points, they often fail to implement them consistently throughout the entire process. However, a harmonised and proactive control system is crucial for increasing the likelihood of achieving organisational objectives and aligning internal behaviours with those objectives.

Each type of control impacts specific aspects of risk management, but only an integrated approach-one that combines multiple control mechanisms-can produce truly effective responses. This finding aligns with existing literature, which emphasises that managing non-financial risks requires a systemic perspective and coherence between strategy, control, and stakeholder engagement.

5. Conclusions, limitations, and future research

In conclusion, adopting an integrated approach to risk management that combines strategy, control systems, and active stakeholder engagement represents not only a theoretical challenge but also a practical means to enhance organisational resilience and sustainability.

While this study makes a significant contribution to the field, it also has its limitations. The findings primarily rely on a review of existing literature, which may not fully capture the diverse range of risk management experiences and practices found in different business contexts.

Moreover, fsQCA provides significant insights into complex causal structures, but it comes with its own set of challenges. A major issue is the calibration process, which transforms raw data into fuzzy sets. This process requires researchers to make critical decisions based on theoretical reasoning and assumptions (Ragin, 2008). As a result, even small changes in calibration thresholds can lead to different configurations and interpretations, highlighting the method's sensitivity and the inherent subjectivity involved. Moreover, although fsQCA excels at examining the interplay among conditions within causal configurations, it does not quantify the causal power of individual conditions or uncover the underlying causal mechanisms. Therefore, employing complementary analytical approaches-whether qualitative or statistical-could deepen the understanding of these complex relationships.

Additionally, the findings from fsQCA are often context dependent, necessitating caution when attempting to generalise results beyond the specific cases studied (Jiang *et al.*, 2018). Conducting replication studies across various settings can enhance the external validity and robustness of the conclusions.

Even though efforts were made to calibrate variables based on objective benchmarks, some degree of subjectivity was unavoidable. As Ragin (2009) has pointed out, defining thresholds inevitably involves the researchers' theoretical and empirical judgement. Thus, while fsQCA can

identify necessary conditions within a given configuration, Dul (2016) has suggested that Necessary Condition Analysis (NCA) provides a valuable extension by identifying additional necessary conditions and quantifying the minimum levels required to achieve a specific outcome. In this context, applying NCA in future quantitative studies could offer greater clarity regarding the role and relevance of necessary conditions.

As a priority for future research, we advocate for the need to analyse how controls act, specifically in the management of non-financial risks. Controls are essential to prevent, manage, and trigger a proactive and doubtful attitude within the company regarding unexpected events, which can help identify risks. The active participation of the staff enables the correct management of critical situations. Furthermore, a high governance sensitivity and the presence of corporate values aimed at orienting risk management processes facilitate a reduction in the occurrence of risks and the effective management of unexpected events when they occur. Future research should analyse, above all, the role of value and organisational controls, which are currently underestimated in risk management processes. Along with other controls, they have a fundamental role to play in facilitating emergency responses.

Additionally, our study identifies the importance of managing all risk management phases and the relationships between controls and the risk management phases. Future research should thoroughly investigate the nature of the relationship between controls and risk management phases to understand whether it is possible to start with this relationship and provide a profile of the risks that might be faced by companies. This would allow companies to systematically manage all stages of risk management and act on non-financial risks through a harmonised system of controls to address unplanned situations (Bedford and Malmi, 2015; Passetti *et al.*, 2021; Rikhardsson *et al.*, 2021; Van der Kolk *et al.*, 2015).

This study also highlights the fundamental role of stakeholders in risk management. Future research could analyse the degree of engagement among each category of stakeholder and propose suggestions for increasing this engagement. Furthermore, it would be very useful for companies to identify the most strategic categories of stakeholders that need to be more involved to effectively manage risks. This involvement is useful for companies to identify risks and effectively manage them and respond to the needs and requests of stakeholders. Furthermore, it is important to improve the relationship between the company and its stakeholders, who play a fundamental role in the survival of companies.

Future research could also benefit from replicating this fsQCA-based approach in different companies, regions, and institutional contexts to improve generalisability. Combining fsQCA with longitudinal or mixed-method designs may provide a more comprehensive understanding of causal pathways and the dynamics of systemic risk governance over time. Additionally, integrating stakeholder interviews or using hybrid approaches such as NCA or structural equation modelling may provide more detailed insights into the strength, direction, and conditionality of specific risk management configurations. Furthermore, our findings highlight the importance of examining corporate strategies for integrating

non-financial risk management frameworks, particularly through the explicit or implicit involvement of stakeholders in risk management practices. Future research could undertake an empirical analysis of a sample of companies to explore the role of stakeholders, their level of engagement in non-financial risk management phases, the categories of stakeholders prioritised by companies, and the challenges they encounter in involving these stakeholders. Such an empirical analysis could generate valuable practical evidence that can be compared with existing literature. The proposed research may also serve as a guide in identifying the risk management phases that should be considered in empirical studies.

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Annex 1. Literature Review

Authors	Year	Title of the article	Object of control	Research object	Stakeholder
Risk assessment					
Zafar I., Wuni I.Y., Shen G.Q.P., Ahmed S., Yousaf T.	2019	A fuzzy synthetic evaluation analysis of time overrun risk factors in highway projects of terrorism-affected countries: the case of Pakistan	Action - how to act in order not to exceed the project times	Highway projects, risk and stakeholder management	General reference to stakeholders, without specification
Lo F.Y., Wong W.K., Geovani J.	2021	Optimal combinations of factors influencing the sustainability of Taiwanese firms	Result - control over the results of financial performance	Optimal combinations of factors from institutional environment adaptation mechanisms and internal resources or capabilities that influence the sustainability of a firm.	General reference to stakeholders, without specification
Testorelli R., Verbano C.	2020	Value creation with project risk management: a systematic literature review	Result - identify, analyse, evaluate and address the risks inherent in the project	Project risk management as a process of creating value for companies.	General reference to stakeholders, without specification
Liu W., Wei W., Yan X., Dong D., Chen Z.	2020	Sustainability risk management in a smart logistics ecological chain: An evaluation framework based on social network analysis	Result - check results to reduce risk	Risk management in the smart logistics eco-chain	General reference to stakeholders, without specification
Hernandez D.F., Haddud A.	2018	Value creation via supply chain risk management in global fashion organizations outsourcing production to China	Result - control over operational performance	Complexity of global supply chains and its intrinsic risk	Customers
Gogan L.M.	2014	A new Platform to Evaluate Intellectual Capital	Result - platform to control the results of intellectual capital	It evaluates intellectual capital	Employees
Popescu S.G., Petruş A.A.	2012	Risk analysis methods in project management. Critical analysis	Result - identify risks in the assessment and control phases	Project management	Employees
Lo F.Y., Wong W.K., Geovani J.	2021	Optimal combinations of factors influencing the sustainability of Taiwanese firms	Personnel - checks on innovation capacity and production capacity and human capital	Optimal combinations of factors from institutional environment adaptation mechanisms and internal resources or capabilities that influence the sustainability of a firm	General reference to stakeholders, without specification
Testorelli R., Verbano C.	2020	Value creation with project risk management: a systematic literature review	Personnel - checks on perceptions and expectations	Project risk management as a process of creating value for companies.	General reference to stakeholders, without specification
Zafar I., Wuni I.Y., Shen G.Q.P., Ahmed S., Yousaf T.	2019	A fuzzy synthetic evaluation analysis of time overrun risk factors in highway projects of terrorism-affected countries: the case of Pakistan	Personnel - checks on the workforce	Highway projects, risk and stakeholder management	General reference to stakeholders, without specification
Hernandez D.F., Haddud A.	2018	Value creation via supply chain risk management in global fashion organizations outsourcing production to China	Personnel - checks on the risk elements that have proved to be the most influential	Complexity of global supply chains and its intrinsic risk	Customers
Fotr J., Spacek M., Soucek I., Vacik E.	2015	Scenarios, their concept, elaboration and application	Personnel - work with risks and give organizational support of the results in the company	It explains the risk mitigation approach	Social stakeholders
Gogan L.M.	2014	A new Platform to Evaluate Intellectual Capital	Personnel - control over intellectual capital	Evaluate intellectual capital	Employees
Popescu S.G.	2012	Risk analysis methods in project management. Critical analysis	Personnel - personnel checks	Project management	Employees
Hsiao A., Ploughman M.	2009	Strategic Risk Management in New Product Development	Personnel - checks on project execution	How SMEs manage the risks associated with innovation	General reference to stakeholders, without specification
Lo F.Y., Wong W.K., Geovani J.	2021	Optimal combinations of factors influencing the sustainability of Taiwanese firms	Cultural - checks on the corporate sustainability index	Optimal combinations of factors from institutional environment adaptation mechanisms and internal resources or capabilities that influence the sustainability of a firm	General reference to stakeholders, without specification
Testorelli R., Verbano C.	2020	Value creation with project risk management: a systematic literature review	Cultural - control over the measurement of value	Project risk management as a process of creating value for companies.	General reference to stakeholders, without specification
Zafar I., Wuni I.Y., Shen G.Q.P., Ahmed S., Yousaf T.	2019	A fuzzy synthetic evaluation analysis of time overrun risk factors in highway projects of terrorism-affected countries: the case of Pakistan	Cultural - Decision support system for risk management	Highway projects, risk and stakeholder management	General reference to stakeholders, without specification
Hernandez D.F., Haddud A.	2018	Value creation via supply chain risk management in global fashion organizations outsourcing production to China	Cultural - controls to measure the risk associated with global outsourcing	Complexity of global supply chains and its intrinsic risk	Customers
Fotr J., Spacek M., Soucek I., Vacik E.	2015	Scenarios, their concept, elaboration and application	Cultural - controls to mitigate risk	It explains the risk mitigation approach	Social stakeholders

Authors	Year	Title of the article	Object of control	Research object	Stakeholder
Risk reporting					
Karwowski M., Raulinajtys-Grzybek M.	2021	The application of corporate social responsibility (CSR) actions for mitigation of environmental, social, corporate governance (ESG) and reputational risk in integrated reports	Action - analyze the role of CSR in risk mitigation	CSR to prevent the risks borne by companies	Stakeholders involved in CSR
Lakshan A.M.I., Low M., de Villiers C.	2021	Management of risks associated with the disclosure of future-oriented information in integrated reports	Action - information disclosure controls	PurposeIntegrated reporting (IR) promotes the disclosure of future-oriented information to enable financial stakeholders to make better-informed decisions	Disclosure of information to enable stakeholders to make more informed decisions
Reimsbach, D., Schiemann F., Hahn R., Schmiedchen E.	2020	In the Eyes of the Beholder: Experimental Evidence on the Contested Nature of Materiality in Sustainability Reporting	Action - risk assessment controls	Information from sustainability reports	General reference to stakeholders, without specification
Bager S.L., Lambin E.F.	2020	Sustainability strategies by companies in the global coffee sector	Action - checks on sustainable action efforts	Sustainability challenges in the coffee sector	General reference to stakeholders, without specification
Buniamin S.	2020	Managers' perceptions on stakeholder power in relation to esg reporting	Action - checks on the perceptions of managers	It investigates managers' perceptions of stakeholder power among different stakeholder groups in relation to ESG reporting	Employees, shareholders, communities, customers
Baditoiu B.R.	2019	The integrated reporting "stakeholder relationships" principle in the ccount financial sector	Action - information disclosure controls	Analysis of the quality and complexity of the content found in the integrated reports	The relationship with stakeholders reduces corporate risk. Shareholders and investors, employees, customers and suppliers, the community and the environment
Guserl R.	2016	Unprofessionalism in finance leads to destructive effects on corporate governance	Action - control system design and implementation	How corporate governance is the system that directs and controls the operations of the firm	Suppliers, customers and shareholders
Al-Shaer H., Albitar K., Hussainey K.	2022	Creating sustainability reports that matter: an investigation of factors behind the narratives	Result - controls on risk communication in sustainability reports	It examines sustainability reports	General reference to stakeholders, without specification
Koc K., Gurgun A.P.	2021	Stakeholder-Associated Life Cycle Risks in Construction Supply Chain	Result - checks on results in construction projects	Risk identification to meet supply chain performance objectives in construction projects	General reference to stakeholders, without specification
Karwowski M., Raulinajtys-Grzybek M.	2021	The application of corporate social responsibility (CSR) actions for mitigation of environmental, social, corporate governance (ESG) and reputational risk in integrated reports	Result - control over the results to prevent risks	CSR to prevent the risks borne by companies	Stakeholders involved in CSR
Lakshan A.M.I., Low M., de Villiers C.	2021	Management of risks associated with the disclosure of future-oriented information in integrated reports	Result - results control	PurposeIntegrated reporting (IR) promotes the disclosure of future-oriented information to enable financial stakeholders to make better-informed decisions	Disclosure of information to enable stakeholders to make more informed decisions
Buniamin S.	2020	Managers' perceptions on stakeholder power in relation to esg reporting	Result - ESG risk controls	It investigates managers' perceptions of stakeholder power among different stakeholder groups in relation to ESG reporting	Employees, shareholders, communities, customers
Ahmed D.A.H., Eliwa Y., Power D.M.	2019	The impact of corporate social and environmental practices on the cost of equity capital: UK evidence	Result - lower level of risk for companies managing social and environmental problems	Integration of social and environmental practices into company operations requested by stakeholders	Companies carry out operations requested by stakeholders
Schaltegger S., Zvezdov D., Etxeberria I.A., Csutora M., Günther E.	2015	Corporate carbon and climate accounting	Result - risk controls	Management accounting approaches for analyzing the business benefits and costs of climate change	Relationship with stakeholders
Henklang P., Boonlua S., Ussahawanitchakit P.	2014	Proactive internal control system and firm success: A conceptual framework	Result - proactive internal control system	It investigates organizational risk reduction and stakeholder satisfaction	Stakeholder satisfaction
Callaghan J., Nehmer R.	2009	Financial and governance characteristics of voluntary XBRL adopters in the United States	Result - reporting control	eXtensible Business Reporting Language (XBRL)	community, investors, analysts, regulators and various other corporate stakeholders
Smythe J.	2007	Employee engagement - Its real essence: … and how it helped to transform a top-four UK bank	Result - control over the power given to employees	It explains how opening up decision making to those who can add value helps to transform organizational performance	Employees power
Stanbury J., Pryer M., Roberts A.	2005	Heroes and villains - Tour operator and media response to crisis: An exploration of press handling strategies by UK adventure tour operators	Result - controls on the influence of the media	Strategies employed to handle press during crisis will have far-reaching implications on the reputations of adventure tour operators, and the industry	Costumers
Lakshan A.M.I., Low M., de Villiers C.	2021	Management of risks associated with the disclosure of future-oriented information in integrated reports	Personnel - ensure individual accountability for achieving goals	PurposeIntegrated reporting (IR) promotes the disclosure of future-oriented information to enable financial stakeholders to make better-informed decisions	Disclosure of information to enable stakeholders to make more informed decisions
Karwowski M., Raulinajtys-Grzybek M.	2021	The application of corporate social responsibility (CSR) actions for mitigation of environmental, social, corporate governance (ESG) and reputational risk in integrated reports	Personnel - work control	CSR to prevent the risks borne by companies	Stakeholders involved in CSR
Buniamin S.	2020	Managers' perceptions on stakeholder power in relation to esg reporting	Personnel - ESG risk controls	It investigates managers' perceptions of stakeholder power among different stakeholder groups in relation to ESG reporting	Employees, shareholders, communities, customers
Lakshan A.M.I., Low M., de Villiers C.	2021	Management of risks associated with the disclosure of future-oriented information in integrated reports	Cultural - link the disclosed objectives to the company's risk management practices	PurposeIntegrated reporting (IR) promotes the disclosure of future-oriented information to enable financial stakeholders to make better-informed decisions	Disclosure of information to enable stakeholders to make more informed decisions
Karwowski M., Raulinajtys-Grzybek M.	2021	The application of corporate social responsibility (CSR) actions for mitigation of environmental, social, corporate governance (ESG) and reputational risk in integrated reports	Cultural - risk cultural control	CSR to prevent the risks borne by companies	Stakeholders involved in CSR
Baig, M.H., Jin, X., Ali, R.	2024	Politically connected business and real earnings management: the moderating role of family control and audit quality	Result - Financial risk	Financial information related to risks	Internal and external stakeholder
Xiaoxia, L., Minghui, L.	2023	Do creditors punish real earnings management behavior? Evidence from the cost of debt	Result - Financial risk	Financial information related to risks	Finanacial information to stakeholder
Buniamin S.	2020	Managers' perceptions on stakeholder power in relation to esg reporting	Cultural - ESG risk controls	It investigates managers' perceptions of stakeholder power among different stakeholder groups in relation to ESG reporting	Employees, shareholders, communities, customers

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Authors	Year	Title of the article	Object of control	Research object	Stakeholder
			Risk treatment		
Guserl R.	2016	Unprofessionalism in finance leads to destructive effects on corporate governance	Action - controls on actions to manage risks	How corporate governance is the system that directs and controls the operations of the firm	Suppliers, customers and shareholders
Lueg R., Pedersen M.M., Clemmensen S.N.	2015	The Role of Corporate Sustainability in a Low-Cost Business Model - A Case Study in the Scandinavian Fashion Industry	Action - controls on actions to manage risks	Corporate sustainability contributes to the low-cost business model	General reference to stakeholders, without specification
Bostan I., Tulvinschi M., Mates D., Grosu V., Hlaciuc E., Socoliuc M., Bobar A., Mihalciuc C.	2012	Observations on budgeting and planning under an efficient controlling system on a corporate level	Action - control procedures	How companies must manage the risks that also affect the relationship with stakeholders	Business partners or other categories of stakeholders
Kuruppu, S.C., Milne, M.J., Tilt, C.A.	2024	Sustainability control systems in short-term operational and long-term strategic decision-making	Action - sustainability control systems	Economic, social and environemntal risks	Stakeholder engagement
Leopoulos V., Kirytopoulos K., Malandrakis C.	2004	Addressing the problem of limited resources in managing risks	Action - identification, analysis, practices of mitigation of risks	Project Risk Management	It describes the effort that Risk Managers make to persuade Project Stakeholders about the benefits that Risk Management can bring
Liu, Z.X., Ding, R.G., Wang, L., Song, R., Song, X.Y.	2023	Cooperation in an uncertain environment: The impact of stakeholders' concerted action on collaborative innovation projects risk management	Action - risk management in project	Project Risk Management	Risk management strategies of stakeholders
Osland A., Osland J.S.	2007	Aracruz Celulose: Best practices icon but still at risk	Action - operational control practices	Global risks facing an award-winning company known for best practices in sustainability and HRM that, nevertheless, is challenged by a contentious land dispute with indigenous communities and numerous stakeholders	Human resources management
Wang Z.S., Zhou Y.X., Jin X.H., Zhao N., Sun J.S.	2022	Risk allocation and benefit distribution of PPP projects for construction waste recycling: a case study of China	Result - projects check	Public-private partnership (PPP) projects	Sharing risk and distributing income to achieve a win-win situation for all among the different stakeholders
Wu P.-J., Lin L.-T., Huang C.-C.	2021	Diagnosing the service quality of perishable-food logistics: temperature-sensitive milk delivery	Result - quality control in the cold chain	It investigates the service quality of such logistics, using a real-life case of temperature-sensitive milk delivery	Collaborating with their stakeholders can help mitigate potential risks
Prioteasa A.L., Ciocoiu C.N., Chitimiea A., Vaduva V.R.	2020	An Approach To The Implementation of Risk Management In Operating Activities of Romanian SMEs	Result - risk management controls	SMEs and risk management	Increase in stakeholder satisfaction and their involvement in risk management
Liu W., Wei W., Yan X., Dong D., Chen Z.	2020	Sustainability risk management in a smart logistics ecological chain: An evaluation framework based on social network analysis	Result - checks with social network analysis to analyze risk factors	Risk management in the smart logistics eco-chain	General reference to stakeholders, without specification
Zhu J., Hertogh M., Zhang J., Shi Q., Sheng Z.	2020	Incentive mechanisms in mega project-risk management considering owner and insurance company as principals	Result - risk control in projects	In mega-projects, stakeholders can be exposed to significant construction risks	Stakeholder, especially owners and insurance companies
Abiodun Eniola A.	2020	Internal control procedures and firm's performance	Result - risk control, management and monitoring practices	It analyzes internal control procedures and the performance of the company	General reference to stakeholders, without specification
Manab N.A., Aziz N.A.A.	2019	Integrating knowledge management in sustainability risk management practices for company survival	Result - checks on unknown risks associated with environmental complexity	Sustainability risk management	The negative effects of risks affect the corporate image and relationships with business partners or other categories of stakeholders
Guimarães A.G., Vaz-Fernandes P., Ramos M.R., Martinho A.P.	2018	Co-processing of hazardous waste: The perception of workers regarding sustainability and health issues in a Brazilian cement company	Result - sustainability checks in a cement factory	The practise of co-processing	Perception of workers
ElKelish W.W.	2018	Corporate governance risk and the agency problem	Result - statistical checks	It investigates the relationship between corporate governance risk and agency costs across different countries	Risk management helps different stakeholders make decisions
Matescu R.M., Maftei M., Verjel A.-M., Lange S.	2017	The interrelation between risk management and the organizational context: Influence, support and barriers	Result - risk control	Risk management (RM)	It investigates how external factors such as stakeholders, political or social factors and also how vision, strategy and other internal factors related to the organizational context impact the risk management process. Mutual influence is undisputed: a successful management process is supported by all stakeholders, is in line with the corporate vision and strategies and also makes an important contribution to the results of the organization
[No author name available]	2016	Corporate social responsibility and firm risk: The varying effect of individual dimensions	Result - identifying ways to control risk so as to minimize any negative spillovers	It reviews the latest management developments across the globe and pinpoint practical implications	Consumers are increasingly attentive to information regarding risk
Pham T.T.K.	2016	The Relationship between corporate governance and the performance of the Firm: A literature review with a focus on the vietnamses enterprises	Result - well controlled and oriented business development for the company	Corporate governance	Good governance manages risks better and builds good relationships with stakeholders
Schaltegger S., Zvezdov D., Etxeberria I.A., Csutora M., Günther E.	2015	Corporate carbon and climate accounting	Result - performance measurement	Management accounting approaches for analyzing the business benefits and costs of climate change	Relationship with stakeholders
Arnold V., Benford T., Canada J., Sutton S.G.	2015	Leveraging integrated information systems to enhance strategic flexibility and performance: The enabling role of enterprise risk management	Result - performance check	Enterprise Risk Management (ERM)	General reference to stakeholders, without specification
Aureli S., Salvatori F.	2012	Are performance-dependent rewards a viable tool to assure managers' commitment toward firms' goals about risk management'	Result - risk measures in incentive systems	Risk management is crucial for achieving strategic objectives in a complex and uncertain environment	General reference to stakeholders, without specification
Popescu S.G., Petruş A.A.	2012	Risk analysis methods in project management. Critical analysis	Result - identify risks during assessment and control	Project management	Employees
Clarke B.	2011	The eu takeovers directive: A shareholder or stakeholder model?	Result - increased corporate accountability and greater controls over public companies	Risk taking and broad stakeholder view	It considers the well-being of stakeholders
Hendrikse G., Windsperger J.	2008	Introducing "Strategy and governance of networks	Result - risk control and mitigations	relative efficiency of the strategy and governance of an enterprise	Risk mitigation from opportunistic behavior and stakeholder management
Kneebel W.R., Willekens M.	2006	The role of risk management and governance in determining audit demand	Result - controls are only complementary as long as they are voluntary, as mandated controls act as substitutes for non-mandated controls	Disclosures about risk and risk management and actual decisions about corporate governance	External auditing will increase in situations where there are multiple stakeholders with individual risk profiles who may pass on part of the cost of monitoring to other stakeholders
Stanbury J., Pryer M., Roberts A.	2005	Heroes and villains - Tour operator and media response to crisis: An exploration of press handling strategies by UK adventure tour operators	Result - controls to prevent crises	As news dissemination quickens, and consumer awareness increases, strategies employed to handle press during crisis will have far-reaching implications on the reputations of adventure tour operators, and the industry	Consumers, media and stakeholders
Borggraefe J.	2016	Human resources governance and compliance: Introduction and overview	Personnel - Human resources controls	Corporate social responsibility	Human resources, media, and many other social stakeholders as responsible subjects that are expected not only to act compliant but also to act ethically legitimated
Popescu S.G., Petruş A.A.	2012	Risk analysis methods in project management. Critical analysis	Personnel - risk controls to achieve project objectives	Project management	Employees
Hirsch P.B.	2017	Chained to a rock	Cultural - reputational checks	Reputational challenge for brands in social media in an era of heightened political and cultural polarization	Relationship with costumers
Tse M.C., Kahlon R.S.	2013	How Planguage Measurement Metrics: Shapes System Quality	Cultural - risk control to increase the quality of the relationship between people, processes and technology	Innovative IT projects in the public sector healthcare	Reduce the risk of failure of IT projects, improve the understanding and quality of interrelationship between people, processes and technology and consider the point of view of stakeholders
Zeng S.X., Shi J.J., Lou G.X.	2007	A synergetic model for implementing an integrated management system: an empirical study in China	Cultural - control over the integrated management system	The implementation and certification of quality, environmental and occupational health and safety management systems	Stakeholders, customers and institutional environment

Authors	Year	Title of the article	Object of control	Research object	Stakeholder
Risk monitoring					
Britvic J., Merkas Z., Tenjeri T.	2021	POSSIBILITIES OF ISO 9001: 2015 QMS AND ISO/IEC 27001:2013 ISMS INTEGRATION	Action - checks on the quality of products and processes and suppliers	Environmental management systems	Relationship with suppliers
Naidoo M., Gasparatos A.	2018	Corporate environmental sustainability in the retail sector: Drivers, strategies and performance measurement	Action - controls to reduce environmental impacts	Reduction of the internal and external environmental impacts of operations	Pressure from internal and external stakeholders will increasingly become a dominant factor
Guserl R.	2016	Unprofessionalism in finance leads to destructive effects on corporate governance	Action - controls over the company's operations	How corporate governance is the system that directs and controls the operations of the firm	Suppliers, customers and shareholders
Lueg R., Pedersen M.M., Clemmensen S.N.	2015	The Role of Corporate Sustainability in a Low-Cost Business Model - A Case Study in the Scandinavian Fashion Industry	Action - controls to manage risk	Corporate sustainability contributes to the low-cost business model	General reference to stakeholders, without specification
Bostan I., Tulvinschi M., Mates D., Grosu V., Hlaciuc E., Socoliuc M., Bobar A., Mihalciuc C.	2012	Observations on budgeting and planning under an efficient controlling system on a corporate level	Action - businesses need to monitor and validate control activities and procedures	How companies must manage the risks that also affect the relationship with stakeholders	Business partners or other categories of stakeholders
Jin F., Xiang W.W., Ji Z., Zhang B.C.	2022	Quantifying the evolutionary mechanism of COVID-19 impact on international construction multi-projects: a risk driver perspective	Result - control over projects	It quantifies the evolutionary mechanism of coronavirus disease 2019 (COVID-19) impact on international construction multi-projects.	The simulated results of these models are used to drive effective risk control to meet customer requirements
Fakhfakh I., Jarboui A.	2022	Board of director's effectiveness, audit quality and ownership structure: impact on audit risk-Tunisian evidence	Result - revision controls	It investigates the potential influence of internal and external corporate governance mechanisms on audit risk	Investors and stakeholders
Wu P.-J., Lin L.-T., Huang C.-C.	2021	Diagnosing the service quality of perishable-food logistics: temperature-sensitive milk delivery	Result - quality check	It investigates the service quality of such logistics, using a real-life case of temperature-sensitive milk delivery	Collaborating with their stakeholders can help mitigate potential risks
Abiodun Eniola A.	2020	Internal control procedures and firm's performance	Result - internal control procedures	It analyzes internal control procedures and the performance of the company	General reference to stakeholders, without specification
Ahmed D.A.H., Eliwa Y., Power D.M.	2019	The impact of corporate social and environmental practices on the cost of equity capital: UK evidence	Result - controls of social and environmental practices in company operations	Integration of social and environmental practices into company operations requested by stakeholders	Companies carry out operations requested by stakeholders
Parshakov P.	2017	Observing unobservable: estimating the time-varying efficiency of intellectual capital	Result - monitor the dynamic efficiency of a company's intellectual resources	Company intellectual capital (IC) is nowadays considered as a key resource that can transform a company's value	Human resources
Schaltegger S., Zvezdov D., Etxeberria I.A., Csutora M., Günther E.	2015	Corporate carbon and climate accounting	Result - business performance checks	Management accounting approaches for analyzing the business benefits and costs of climate change	Relationship with stakeholders
Aureli S., Salvatori F.	2012	Are performance-dependent rewards a viable tool to assure managers' commitment toward firms' goals about risk management	Result - risk management controls	Risk management is crucial for achieving strategic objectives in a complex and uncertain environment	General reference to stakeholders, without specification
Callaghan J., Nehmer R.	2009	Financial and governance characteristics of voluntary XBRL adopters in the United States	Result - internal reporting	eXtensible Business Reporting Language (XBRL)	Community, investors, analysts, regulators and various other corporate stakeholders
Knechel W.R., Willekens M.	2006	The role of risk management and governance in determining audit demand	Result - auditor checks	Disclosures about risk and risk management and actual decisions about corporate governance	External auditing will increase in situations where there are multiple stakeholders with individual risk profiles who may pass on part of the cost of monitoring to other stakeholders
Borggraefe J.	2016	Human resources governance and compliance: Introduction and overview	Personnel - human resources controls	Corporate social responsibility	Human resources, media, and many other social stakeholders as responsible subjects that are expected not only to act compliant but also to act ethically legitimated

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