



Risk Management as Part of the EU's Corporate Sustainability Reporting Directive Financial Materiality Assessment

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ABSTRACT

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The European Commission introduced the Corporate Sustainability Reporting Directive (CSRD) in 2023, requiring thousands of companies operating in the EU to publish sustainability reports in which these companies must report on their environmental and social sustainability. A vital part of these sustainability reports is assessing sustainability-related risks and opportunities by utilizing the concept of financial materiality. In other words, companies must evaluate the sustainability-related financial risks and opportunities that may impact them in the short-, medium-, and long-term. This process is referred to as a financial materiality assessment.

The identification process of material sustainability-related risks and opportunities (financial materiality assessment) forces companies to utilize and develop their risk management practices and knowledge. This study aimed to bring clarity the financial materiality assessment process and provide guidance for companies with no prior experience in sustainability reporting on how to approach the challenge in hand by embedding risk management approach and principles into the process. This was done by sharing relevant materials, including topical studies and enterprise risk management frameworks, sustainability-related megatrends, and risk reports. In addition, interviews were conducted with individuals responsible for CSRD reporting within their organization or those with expertise in conducting financial materiality assessments in practice.

Key words: sustainability reporting, CSRD, ESRS, sustainability risks and opportunities, risk management, double materiality, financial materiality, ERM, SRM

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1 INTRODUCTION

European Union has, over recent years, taken the initiative to achieve climate neutrality in the EU zone by the year 2050. As part of this goal, the European Commission has created a strategy, referred to as the European Green Deal, to combat climate change, protect biodiversity, improve resource efficiency and accelerate the adoption of circular economy within its member countries. Under the umbrella of the Green Deal, the European Commission has introduced the Corporate Sustainability Reporting Directive (CSRD), which is designed to support the objectives of the Green Deal and to establish a more transparent and sustainable economic system within the EU. The CSRD aims to provide investors and other stakeholders with comprehensive, up-to-date, and comparable information on companies' sustainability performance.

An essential factor in the process of creating a sustainability report according to the requirements of the CSRD is to conduct a double materiality assessment, in which the company addresses both the sustainability impacts of its business operations as well as the sustainability-related risks and opportunities that affect or may affect its business performance from a financial perspective. The identification process of the latter, referred to as the assessment of financial materiality, requires companies to utilize the principles of organizational risk management to determine which sustainability-related risks and opportunities are the most material for them.

As more than 50,000 companies across the European Union will be required to report according to the CSRD by 2026 - and thus also to analyze sustainability-related risks and opportunities when conducting their double materiality assessment - there is a fundamental demand for the introduction of expanded guidance on how to apply existing risk management practices in the assessment process. Moreover, a critical evaluation is needed to assess to what extent the current risk management approaches can enable organizations to complete the task at hand and use the findings of the financial materiality assessment to adjust and develop their current business strategy and business model to become more aligned with the objectives of the Green Deal.

This paper aims to explain how organizations can prepare for this process and to highlight what factors to consider when embedding risk management perspectives into the assessment of financial materiality. The idea is to illustrate how companies that are yet to conduct a double materiality assessment as part of their sustainability reporting activities should incorporate risk management to create a comprehensive and reliable financial materiality assessment. This will be achieved by providing both theoretical frameworks and data, as well as practical recommendations to establish a process to follow and develop further in the coming years as CSRD-aligned sustainability reporting practices become clearer and more widely understood.

The research questions of this study are:

- How can a financial materiality assessment be conducted by using and modifying existing enterprise risk management frameworks?
- What currently available materials and sources should a company utilize when detecting, analyzing, and prioritizing sustainability-related risks and opportunities as part of the financial materiality assessment?
- What are the challenges that organizations may face during the process of assessing financial materiality, and how can these challenges be avoided or managed?

The structure of the thesis is as follows:

In Chapter 2, an overview of the fundamental historical paths and events that have formed the building blocks of sustainability reporting frameworks and standards - such as those introduced by the Global Reporting Initiative (GRI) and more recently by the European Commission and the European Financial Reporting Advisory Group (EFRAG) – will be presented. In Chapter 3, the theoretical framework, consisting of risk management guidelines, European Sustainability Reporting Standards (ESRS), and reports and studies from the World Economic Forum, Sitra and the World Business Council of Sustainable Development (WBCSD), will be used to explain how companies should address and manage sustainability-related risks and opportunities. The methodology of the study is presented in Chapter 4. Chapter 5 outlines the findings of the research interviews. A

discussion of the results and recommendations can be found in Chapter 6. Lastly, the study's conclusions are summarized in Chapter 7.

2 LITERATURE REVIEW

2.1 The historical development of sustainability reporting

Sustainability reporting, which has recently been increasing in importance as part of companies' annual reporting - to the point that it is now seen becoming almost as important as financial reporting in the coming years - has an extensive historical background. The European Union's legislation and regulations in its member countries concerning non-financial reporting have increased considerably, and global sustainability reporting frameworks, such as the Global Reporting Initiative (GRI) and sustainability standards published by the International Financial Reporting Standards (IFRS) and its independent standard-setting body, the International Sustainability Standards Board (ISSB), have captured the interest of both companies and their stakeholders.

The interests that various parties within the business community have concerning sustainability reporting vary. While some companies have business models and strategies where sustainability plays a vital role, others see sustainability merely as a means of attracting capital investments and increasing the likelihood of receiving green funding. In addition, many organizations are facing growing pressure from their stakeholders to act more sustainably. Additionally, there is the EU's Green Deal, which aims to provide more visibility into companies' environmental and social impacts through reporting. To fully understand why such reporting is relevant and crucial for the future of both global sustainability goals as well as for achieving science-based sustainability targets - and how companies that are yet to conduct any sustainability reports, at least according to the newly published frameworks, should proceed with the reporting process - it is necessary to address the historical development of sustainability reporting.

One way of presenting the development of sustainability reporting is to divide it chronologically as follows (Gokten, Ozerhan & Gokten 2020): the *Pre-standardization Period* (years 1962-1998), the *Standardization Period* (years 1999-2016), and the *Post-Standardization Period* (2016 onwards). These periods can be further divided into the *Root Period* (1962), the *Theoretical Preparation Period* (1980-1988) and the *Period of Emergence* (1989-1998), all of which are part of

the pre-standardization era; and the *Institutionalization Period*, which is another term to describe the *Standardization Period* of sustainability reporting (Figure 1).

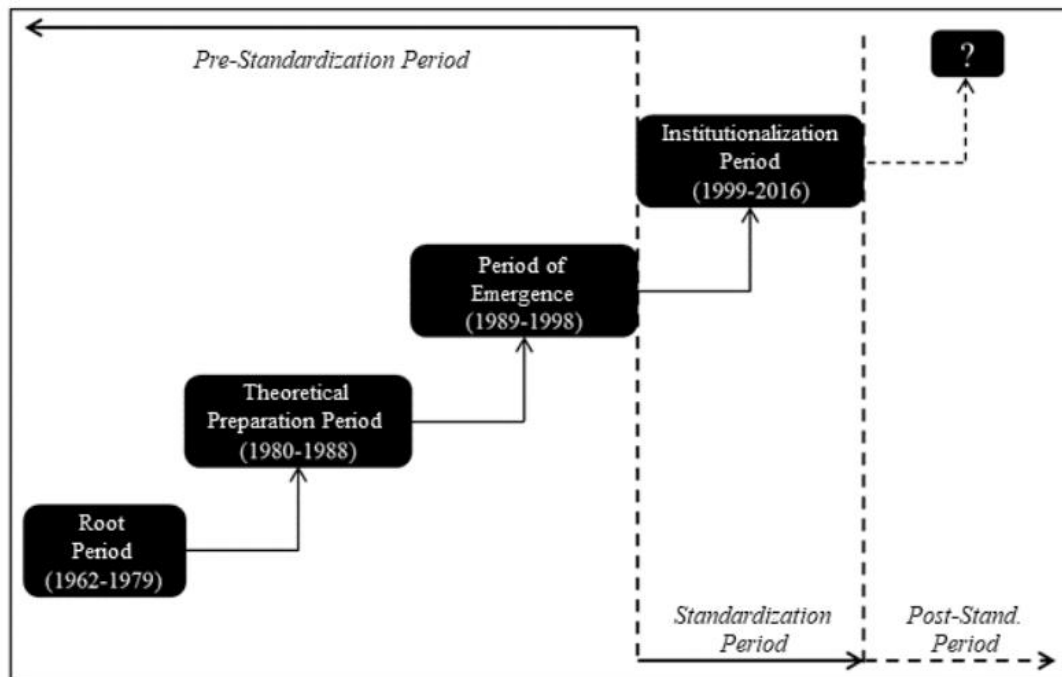


Figure 1. Periods of the Historical Development of Sustainability Reporting (Gokten, Ozerhan & Gokten 2020).

2.1.1 The Root Period

The Root Period, as defined by Gokten, Ozerhan and Gokten (2020), saw the birth of many fundamental ideas and principles that would form the basis for sustainable development perspectives and practices in later years. The relationship between economic development and activities, and negative environmental impacts was beginning to gain interest among scientists. During this period, Rachel Carson released her famous book *Silent Spring*, revealing the negative effects that chemical agriculture had created for the ecosystem (Carson 1963). Moreover, Kenneth Boulding's essay "The Economics of the Coming Spaceship Earth" (1966) questioned our ability to continue practising an exploitative "cowboy economy" based on continuous growth in production without boundaries, causing enormous environmental pollution. He pointed out that humans should live on Earth as if they were in a spaceship, with constant focus on resource levels and waste limits that should not be exceeded. Boulding referred to this concept as "space economics" (Gokten, Ozerhan & Gokten 2020).

Boulding's essay was followed by the Club of Rome's report *The Limits of Growth*, released in 1972, which painted a rather pessimistic picture of our future in a world of exponential growth, increased resource exploitation, and a growing human population. This view faced criticism and alternative perspectives (including Cole et al. 1973 and Lecomber 1975) that underlined the possibilities of technological advancements, particularly through energy and material efficiency when using non-renewable resources. Human capital and technological innovations were thus also seen as solutions to prevent the predicted environmental collapse. In 1972, the United Nations Environment Programme (UNEP) was established and contributed to the creation of multilateral agreements such as CITES in 1973 (The Convention on International Trade in Endangered Species of Wild Fauna and Flora), and CMS in 1979 (The Convention on the Conservation of Migratory Species of Wild Animals), which later became known as the Bonn Convention (Gokten, Ozerhan & Gokten 2020).

2.1.2 The Theoretical Preparation Period

Between 1980 and 1988, the theoretical framework and concept of sustainable development were developed, and the need for sustainability reporting became more fully understood. The report *World Conservation Strategy*, developed in 1980 by the International Union for Conservation of Nature (IUCN) in cooperation with UNEP, stated that the capacity of the global ecosystem and its resources to support life on Earth is limited, and thus, economic development should always consider the needs of future generations. This was followed by the establishment of the World Commission on Environment and Development (WCED), also known as the Brundtland Commission, and its report *Our Common Future*, released in 1987. The report introduced the well-known definition of sustainable development, which is still widely used: "a development that meets the needs of the present without compromising the ability of future generations to meet their own needs". Hopwood, Mellor and O'Brien (2005) note that the definition and the ideas shared in the report "recognize the dependency of humans on the environment to meet needs and well-being in a much wider sense than merely exploiting resources". The idea that the basic needs of every human should be prioritized, and that the current generation should make their decisions with consideration

for future generations, resulted in the formulation of three pillars of sustainable development: economic, environmental and social dimensions (Gokten, Ozerhan & Gokten 2020).

As a result of this report, the idea that economic development and environmental health were strongly interlinked became widely accepted. In other words, organizations through their actions and activities can have a positive or negative influence on sustainable development and thus play a key role in creating a future in which future generations can prosper (Gokten, Ozerhan & Gokten, 2020). Understanding how companies' actions impact the surrounding environment is the first step; the next step is to take action to prevent, mitigate, or, in some (positive) cases, maximize this identified impact. This is part of the process of sustainable risk management, which in turn plays an important role in sustainability reporting practices.

2.1.3 The Period of Emergence

The concept of environmental reporting gained more support after the Exxon Valdez oil spill in 1989, which resulted in significant negative environmental impacts (e.g., the collapse of herring and seabird populations) and social impacts (such as depression and post-traumatic stress among native Alaskan families) and ended up costing the company and its shareholders hundreds of millions of dollars (Bell & Lundblad 2011). The term environmental accounting (which at the time included early perspectives on sustainability reporting) was introduced shortly thereafter. The environmental destruction and financial losses experienced by Exxon Valdez's shareholders underscored the need for greater corporate accountability in keeping investors informed about the sustainability of business activities. Stakeholders were now seen having a fundamental right to know more about the environmental impacts of companies' business operations. Moreover, research on the role of both the private and public sectors in promoting sustainable practices led to the development of essential sustainability concepts still widely used today. One of these was the triple bottom line approach (people, planet, profit) introduced by the leading sustainability expert John Elkington (1998), who argued that economic, environmental, and social impact assessments should carry equal weight in business decision-making. According to the

principle of the triple bottom line (TBL) approach, businesses are expected to act in line with sustainable development principles and, based on the idea of stakeholder accountability, must also report on their actions and role in sustainable development (Elkington 1998, Gokten, Ozerhan & Gokten 2020).

The non-profit organization Coalition for Environmentally Responsible Economies (CERES) responded to the Exxon Valdez incident by releasing the Valdez principles, which included ten basic principles for ethical business activities, such as the sustainable use of natural resources, risk reduction, public disclosure, management commitment, and audit-reporting. This was followed by the introduction of initiatives such as the Oil Pollution Act, which outlined several potential penalties and associated costs that oil companies might face for failing to prevent specific security violations. The Oil Pollution Act has been strongly criticized for imposing overstated economic liabilities on oil companies (Morgan 1994), while simultaneously leaving too many gaps and open questions should a similar accident occur in the US (Kim 2002). Nevertheless, this was one of the first instances in which investors and creditors began to focus more on the financial risks associated with environmental impacts (Gokten, Ozerhan & Gokten 2020).

In 1997, CERES and the Tellus Institute, with support from UNEP, established the Global Reporting Initiative (GRI). The GRI steering committee highlighted the need to develop a sustainability reporting framework that would assess companies' activities by utilizing all three pillars of sustainable development (environment, social aspects, and economy). This marked the evolution of environmental accounting into the sustainability reporting practices we recognize today (Gokten, Ozerhan & Gokten 2020).

2.1.4 The Standardization Period

According to Gokten, Ozerhan and Gokten (2020), the Standardization Period includes the development of institutions for sustainability reporting, such as the GRI. Over the years between 2000 and 2016, the GRI became an independent non-profit organization with its own sustainability reporting guidelines, training documentation, and certificates and was recognized by the United Nations as the official institution to release a framework for sustainability reporting. The global

standards for sustainability reporting introduced by the GRI in 2016 allowed companies to report on their sustainability activities in a manner that increases comparability, quality, and transparency, and thus continues to enable stakeholders to stay informed about companies' business operations (Gokten, Ozerhan & Gokten, 2020).

The history of sustainability reporting has resulted in increased expectations and demands regarding companies' approach to sustainable development. The current legislation and regulations by the EU, such as the Corporate Sustainability Reporting Directive (CSRD), can be seen as another step forward in a development that began more than six decades ago and is likely to accelerate as the fundamental issues that gave birth to sustainability reporting have become more apparent than ever before.

2.2 The Concept of Sustainability Risk Management (SRM)

An essential part of sustainability reporting is embedding a company's risk management function and expertise in the reporting process and leveraging the knowledge base it already has concerning sustainability-related risks. Merging sustainability approaches and considerations into risk management is a relatively recent and still underdeveloped way to manage risks in many companies, particularly among SME's. To understand how and when sustainability-focused risk management began to gain importance, one must look into the relevant literature on the topic.

One of the major publications on the topic was Dan Anderson's book *Corporate Survival – The Critical Importance of Sustainability Risk Management* (2006), in which the author presents several examples and explains how organizations can be affected by sustainability-related risks. Anderson emphasizes that research seems to provide evidence that considering sustainability-linked aspects when making business decisions results in improved financial performance. He covers several liability cases in which global corporations have been forced to compensate for environmental and social damage caused by their business activities and demonstrates how these actions are clearly linked to a company's inability to predict and foresee actual and potential sustainability-related risks. In a 2007 panel

discussion, Anderson expressed his concerns related to short-term thinking in traditional risk management assessments. Since sustainability-linked risks can often be prevented only through actions planned decades in advance, companies find it difficult to achieve this by relying on current business management methods and models, which overemphasize short-term thinking at the expense of long-term perspectives (Anderson 2006, Anderson & Anderson 2009).

Another framework designed to merge risk assessment and sustainability considerations, particularly focusing on how these should be embedded into product development, has been published by Palousis, Luong, and Abhary (2010). According to their sustainability risk assessment (SRA) framework, the sustainability risks that affect companies can be identified and evaluated by utilizing the integrated bottom line (IBL) approach. Unlike the triple bottom line (TBL) perspective, IBL does not treat environmental and social issues as equal and sees them as strongly linked to the economic domain. In other words, the IBL perspective holds that sustainability risks can only be identified as such if they also influence the economic bottom line. Palousis, Luong, and Abhary further stress that for a sustainability risk to emerge, three conditions need to be met: 1) The product or service should, based on life-cycle assessment (LCA), contribute to an unsustainable trend (e.g., pollution or land degradation); 2) There must be a societal response linked to this unsustainable trend (such as employee strikes, customer boycotts, government tax penalties etc.); and 3) This societal response should affect the life-cycle costs of the product or service, for example, through higher logistical or material costs. These cause-and-effect relationships can then be used to evaluate and explain which sustainability risk management aspects should be considered in developing a product or a service (Palousis, Luong & Abhary 2010; Schulte & Hallstedt 2018).

Schulte and Hallstedt (2018) highlight that sustainability risks differ in nature depending on whether they are addressed from a societal or a company perspective. For example, when examining sustainability risks from a societal perspective, an economic system contributing to achieving social and ecological sustainability may not be essential for attaining a sustainable state. Conversely, from the company perspective, according to Schulte and Hallstedt (2018, p. 11) “the main objective is to sustain the company within the economic system through

stakeholder value creation”. They further explain that “it is primarily about the risk of the societal sustainability transition on company objectives, meaning that the sustainability transition is a source of uncertainty”. This view is illustrated in Figure 2.

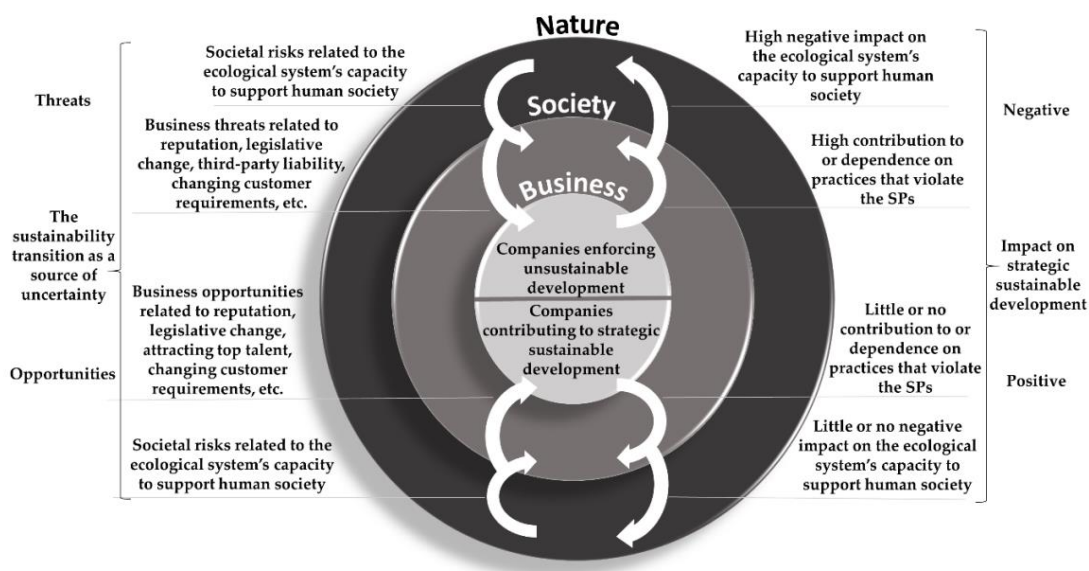


FIGURE 2. Explanation on how nature, society, and business are nested, inter-dependent systems in which the sustainability transition is a source of uncertainty. The effect of this uncertainty on company objectives, on the left side, is dependent on the company’s contribution or counteraction to strategic sustainable development, on the right side (Schulte & Hallstedt 2018).

2.3 CSR and ESRS standards

In January 2023, the European Commission’s Corporate Sustainability Reporting Directive (CSRD) entered into force. The directive is part of the EU’s Green Deal Plan (2022) and replaces the previous Non-Financial Reporting Directive (NFRD), which required large public-interest companies with more than 500 employees to report on their sustainability information. This information has included environmental and social matters as well as governance and due diligence data reporting. The idea behind these directives is to provide sufficient information for investors and other stakeholders to enable them to assess companies’ impacts on the environment and society. Furthermore, the goal is to identify the financial risks and opportunities that may arise from sustainability issues, such as climate

change and biodiversity, and thus affect companies' financial performance (European Commission 2021).

The CSRD broadens the scope of companies required to include sustainability reporting in their annual reports. In 2025, companies that were already obligated to report according to the NFRD rules will begin reporting for the year 2024 based on the requirements of the CSRD, whereas other large, listed companies and small and medium-sized enterprises (SME's) will need to start reporting from 2026 onwards. The exact reporting year depends on the company size, more precisely on the number of employees, annual turnover, and the company's current assets (TABLE 1).

TABLE 1. Companies reporting according to CSRD (European Commission 2023).

Company	Year
Companies already required to report according to NFRD	2025 (of the year 2024)
Other large companies*	2026 (of the year 2025)
Listed SME's	2027 (of the year 2026)

*Companies that have 250 or more employees, annual net turnover of 25 million euros or more and total assets of 50 million euros.

A vital part of the CSRD are the 12 European Sustainability Reporting Standards (ESRS,) which consist of two cross-cutting standards and 10 topical standards. The cross-cutting standards include ESRS 1 (General Requirements) and ESRS 2 (General Disclosures). ESRS 1 lists the general principles that should be applied when reporting according to the ESRS, whereas ESRS 2 specifically defines all the sustainability information a company must disclose, regardless of the sustainability matter in question. Reporting according to ESRS 2 is mandatory for all companies that fall under the scope of CSRD. The topical standards are divided into three separate sustainability groups: environmental, social, and governance. Each of these groups includes at least one or more sustainability topics, such as climate change (ESRS E1) and consumers and end users (ESRS S4). The topics themselves consist of multiple sub-topics and sub-sub-topics designed to provide reporting entities with greater clarity and a better understanding of the

sustainability issues and themes generally linked to the topics listed in the ESRS (TABLE 2).

TABLE 2. European Sustainability Reporting Standards (European Commission 2023).

Topical ESRS	Sustainability matters covered in topical ESRS		
	Topic	Sub-topic	Sub-sub-topics
ESRS E1	Climate change	<ul style="list-style-type: none"> • Climate change adaptation • Climate change mitigation • Energy 	
ESRS E2	Pollution	<ul style="list-style-type: none"> • Pollution of air • Pollution of water • Pollution of soil • Pollution of living organisms and food resources • Substances of concern • Substances of very high concern • Microplastics 	
ESRS E3	Water and marine resources	<ul style="list-style-type: none"> • Water • Marine resources 	<ul style="list-style-type: none"> • Water consumption • Water withdrawals • Water discharges • Water discharges in the oceans • Extraction and use of marine resources

ESRS E4	Biodiversity and ecosystems	<input type="checkbox"/> Direct impact drivers of biodiversity loss	<ul style="list-style-type: none"> • Climate Change • Land-use change, fresh water-use change and sea-use change • Direct exploitation • Invasive alien species • Pollution • Others
		<input type="checkbox"/> Impacts on the state of species	Examples: <ul style="list-style-type: none"> • Species population size • Species global extinction risk
		<input type="checkbox"/> Impacts on the extent and condition of ecosystems	Examples: <ul style="list-style-type: none"> • Land degradation • Desertification • Soil sealing
		<input type="checkbox"/> Impacts and dependencies on ecosystem services	

ESRS E5	Circular economy	<ul style="list-style-type: none"> Resources inflows, including resource use Resource outflows related to products and services Waste 	
ESRS S1	Own workforce	<input type="checkbox"/> Working conditions	<ul style="list-style-type: none"> Secure employment Working time Adequate wages Social dialogue Freedom of association, the existence of works councils and the information, consultation and participation rights of workers Collective bargaining, including rate of workers covered by collective agreements Work-life balance Health and safety
		<input type="checkbox"/> Equal treatment and opportunities for all	<ul style="list-style-type: none"> Gender equality and equal pay for work of equal value Training and skills development Employment and inclusion of persons with disabilities Measures against violence and harassment in the workplace Diversity
		<input type="checkbox"/> Other work-related rights	<ul style="list-style-type: none"> Child labour Forced labour Adequate housing Privacy

ESRS S2	Workers in the value chain	<input type="checkbox"/> Working conditions	<ul style="list-style-type: none"> Secure employment Working time Adequate wages Social dialogue Freedom of association, including the existence of work councils Collective bargaining Work-life balance Health and safety
		<input type="checkbox"/> Equal treatment and opportunities for all	<ul style="list-style-type: none"> Gender equality and equal pay for work of equal value Training and skills development The employment and inclusion of persons with disabilities Measures against violence and harassment in the workplace Diversity
		<input type="checkbox"/> Other work-related rights	<ul style="list-style-type: none"> Child labour Forced labour Adequate housing Water and sanitation Privacy

ESRS S3	Affected communities	<input type="checkbox"/> Communities' economic, social and cultural rights	<ul style="list-style-type: none"> • Adequate housing • Adequate food • Water and sanitation • Land-related impacts • Security-related impacts
		<input type="checkbox"/> Communities' civil and political rights	<ul style="list-style-type: none"> • Freedom of expression • Freedom of assembly • Impacts on human rights defenders
		<input type="checkbox"/> Rights of indigenous peoples	<ul style="list-style-type: none"> • Free, prior and informed consent • Self-determination • Cultural rights
ESRS S4	Consumers and end-users	<input type="checkbox"/> Information-related impacts for consumers and/or end-users	<ul style="list-style-type: none"> • Privacy • Freedom of expression • Access to (quality) information
		<input type="checkbox"/> Personal safety of consumers and/or endusers	<ul style="list-style-type: none"> • Health and safety • Security of a person • Protection of children
		<input type="checkbox"/> Social inclusion of consumers and/or endusers	<ul style="list-style-type: none"> • Non-discrimination • Access to products and services • Responsible marketing practices
ESRS G1	Business conduct	<ul style="list-style-type: none"> • Corporate culture • Protection of whistleblowers • Animal welfare • Political engagement • Management of relationships with suppliers including payment practices 	
		<input type="checkbox"/> Corruption and bribery	<input type="checkbox"/> Prevention and detection including training <input type="checkbox"/> Incidents

As mentioned, companies required to report according to the CSRD need to use the topical standards listed (TABLE 2) to identify the sustainability matters that are most material to them. This will be done by conducting a double materiality assessment, which will be further discussed in the following chapter.

2.3.1 Double materiality assessment

The concept of double materiality is at the core of the CSRD. Companies need to determine which sustainability matters (or topics as they are also defined in the ESRS) are material to them and report according to ESRS 2, while utilizing the list of relevant data points that the European Financial Reporting Advisory Group (EFRAG) has listed in the CSRD guidelines. The double materiality assessment should cover the company's entire value chain, and thus, the focus should not be

solely on its own operations but should also consider business relationships and stakeholder engagement (EFRAG 2024; European Commission 2023).

To identify all material sustainability topics, organizations must conduct a double materiality assessment, which consists of two parts: 1) impact materiality assessment and 2) financial materiality assessment. When assessing impact materiality, a company evaluates its operations' impact on the environment and people (inside-out view). In the financial materiality assessment (outside-in view), the focus is on identifying the risks and opportunities that may arise and could have positive or negative financial impacts on the company and its business performance. Impacts on the environment and people can be actual and/or potential as well as positive or negative (European Commission 2023).

In both the impact materiality and financial materiality assessment, it is essential to review all the sustainability matters listed in the ESRS and identify sustainability issues that are specifically material to the company due to factors such as its operating industry, business model, size, and location of its business. These are known as entity-specific sustainability issues (European Commission 2023).

To evaluate and prioritize sustainability matters, the ESRS lists several factors on which the assessment should be based. In the impact materiality assessment, these include scope (i.e., how geographically wide the impact is or could potentially be), scale (how significant the impacts are or could be in terms of the number of people and other species affected) and the irremediable character (i.e., if environmental destruction caused directly or indirectly by the organization can be repaired and the local ecosystem restored to its initial state, or to what extent workforce violations can be compensated). These factors combined determine the severity of each sustainability matter identified as material for the company (European Commission 2023).

In the financial materiality assessment, organizations need to define the financial consequences of underlying risks and opportunities by utilizing metrics such as impacts on cash flow and influences on access to external investments and the cost of capital. In addition, the ESRS requires companies to evaluate when risks

and opportunities may arise by using timeframes of short-, medium- and long-term (European Commission 2023).

The ESRS does not specify factor-specific thresholds to be used when assessing the materiality of sustainability topics; thus, companies are allowed to define these thresholds themselves. Moreover, double materiality principles enable organizations to omit the assessment of matters they do not deem relevant (or material, according to the directive) for the company without providing a specific explanation. The only exception to this rule is ESRS E1 (Climate change); if omitting this topic as non-material, a detailed reasoning must be provided (European Commission 2023).

2.3.2 Risk management in financial materiality assessment

Since the ESRS provides a substantial amount of freedom for organizations to conduct their double materiality assessments as they see fit - including determining financial risks and opportunities using thresholds they have independently defined - it is crucial to include several business functions and their representatives in the assessment process to achieve the best potential outcomes. This becomes evident when the company focuses on the entire value chain and as a result, comprehensive understanding and knowledge concerning operations and industry specifics is needed. In addition, forecasting potential monetary risks and opportunities can be extremely difficult without expertise in risk management.

Many identified sustainability matters listed in the topical ESRS are also strongly interlinked, as are the impacts, risks, and opportunities that may arise from them. For instance, some potential financial risks and opportunities – such as higher capital costs or increased annual revenue – may be direct results of a company's inability to attract ESG investors due to non-compliance with taxonomy regulation or green energy transformation requirements. This shift benefits energy companies that have invested heavily in renewable energy production. On the other hand, some matters may be material only when considering the company's impact on the environment and people but not from a financial materiality assessment perspective.

Underlining dependencies in organizations' value chains, such as those associated with environmental and social resources, add further complexity to the identification process of potential sustainability-related risks and opportunities. These dependencies are often the source of risks and opportunities and understanding them is essential to performing an effective risk analysis.

Regardless of the method of detection and management of sustainability-related risks and opportunities or the size of the organizations' value chain, the objectives of a financial materiality assessment require an extensive understanding of how to approach the process from a risk management perspective. Comprehensive and well-defined risk management practices help everyone involved in the assessment see how their experience and knowledge of the company's business can be utilized, resulting in more coherent and practical outcomes and findings.

2.4 World Economic Forum: Global Risks Report 2023

Sustainability risks have begun to attract more interest in recent years as global issues such as climate change and biodiversity loss have been identified as threats to human existence as a species. This trend is also evident in global risk reports, including the Global Risks Report released annually by the World Economic Forum (WEF). Whereas several years ago, only one or two of the biggest risks identified in WEF's risk report were clearly sustainability-related, today, most of the global risks listed are environmental and societal in nature. Moreover, as stated by WEF's report, the relative number of sustainability-related risks and their importance is expected to continue rising when considering risks that will have significant impacts in the long-term. For instance, biodiversity loss and ecosystems collapse are increasingly seen as relevant, and risks such as failure to mitigate climate change and failure of climate-change adaptation are listed as two of the most significant risks in the next 10-year period (FIGURE 3).



FIGURE 3. Global risks ranked by severity over the short- and long-term (World Economic Forum Global Risks Report 2023).

The WEF's risk report results provide insight into the dilemma of managing both short-term and long-term risks. Risks with a global impact over a 2-year period and, therefore, affecting companies worldwide here and now, are often prioritized over long-term risks that inherently pose a greater threat to the profitability and survival of businesses. Organizations, much like individuals, tend to manage risks as they arise or only shortly before they are about to materialize, due to the limited risk management skills and knowledge possessed by both the organizations and their personnel (COSO & WBCSD 2018). Furthermore, globalization has led to increased complexity in the global business environment, and companies now operate in a world where global risks are often interlinked. Individual events can create cause-and-effect connections that are often difficult to fully understand and predict. This complexity is also reflected in the WEF's interconnections map of the global risks landscape (FIGURE 4).

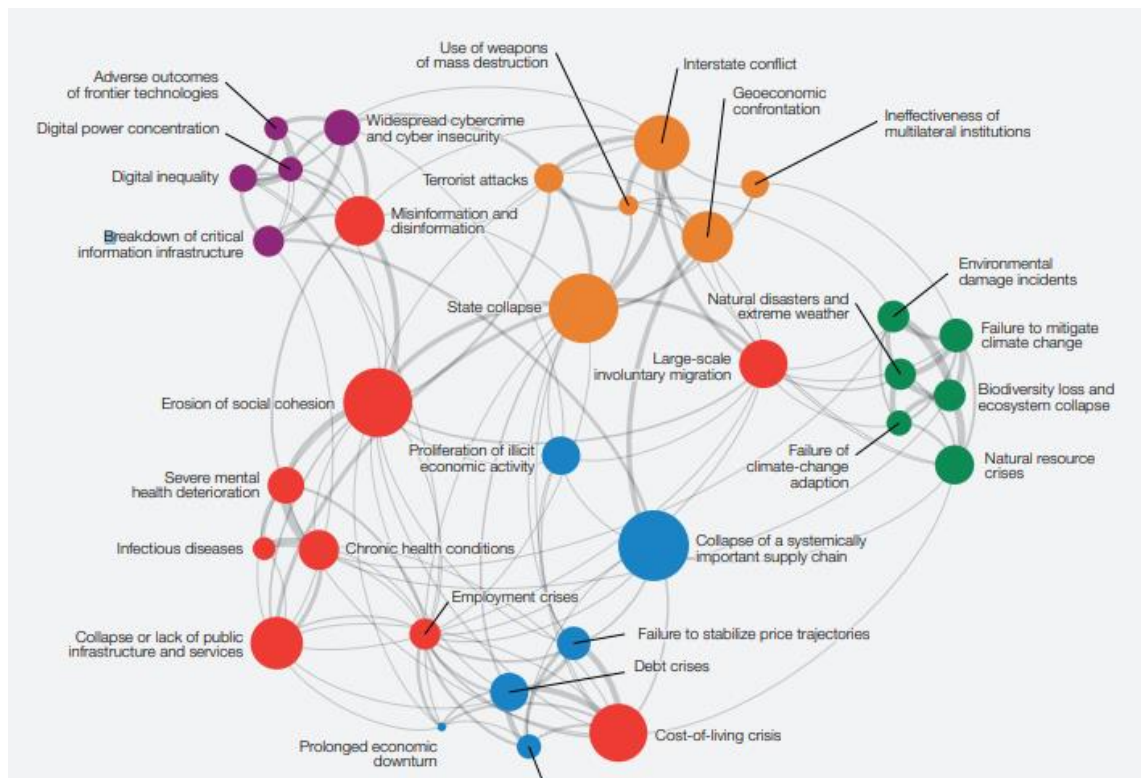


FIGURE 4. Global risks landscape: an interconnections map (World Economic Forum Global Risks Report 2023).

2.5 Sitra's Megatrends 2023 Report

An alternative way to foresee sustainability-related risks and opportunities is to identify global megatrends that will shape our future. The Finnish Innovation Fund Sitra has explored the future of megatrends in its 2023 report, highlighting forces that will largely determine the kind of world we will live in in the coming years. As underlined in the report, megatrends are not surprising events that often materialize in unexpected times and places, and thus, they differ from so called *black swans* (a term introduced by risk analyst Nassim Nicholas Taleb in his 2007 book to describe an unpredictable, rare, and high-impact event that is beyond normal expectations and has profound consequences). Instead, megatrends are long-term trends that unfold over years and decades, continuously sending signals of their existence. Identifying, interpreting, and understanding these signals - and associating them with a broader development context – is vitally important for mitigating the impacts of these trends and adapting to the changes they bring. Additionally, Sitra's goal in reporting on megatrends is to enhance and strengthen the future-oriented thinking of individuals and companies alike (Dufva & Rekola 2023).

When it comes to sustainability themes and the associated risks and opportunities, Sitra's report introduces three categories of megatrends (of a total of five): people, economy, and nature. The report defines a number of challenges linked to these categories. For instance, nature's carrying capacity is eroding, as evidenced by the ongoing effects of climate change and threats to global ecosystems due to biodiversity loss. There are also growing well-being challenges: the foundations of welfare society are weakening, not least due to an aging population and the current and projected dependency ratio. Citizens' mental health is tested by the increasing complexity associated with rapid technological advancements and ecological crisis scenarios. Moreover, the economic foundations are destabilizing, as seen in rising inequality, both in traditional economic terms and in terms of vulnerability to climate-related disasters and financial crises. The current economic system, built on the principle of capitalistic overconsumption, is unsustainable, and those unable to benefit from it are often the first to face its shortcomings, while more privileged individuals are expected to experience these impacts later (Dufva & Rekola 2023, FIGURE 5).

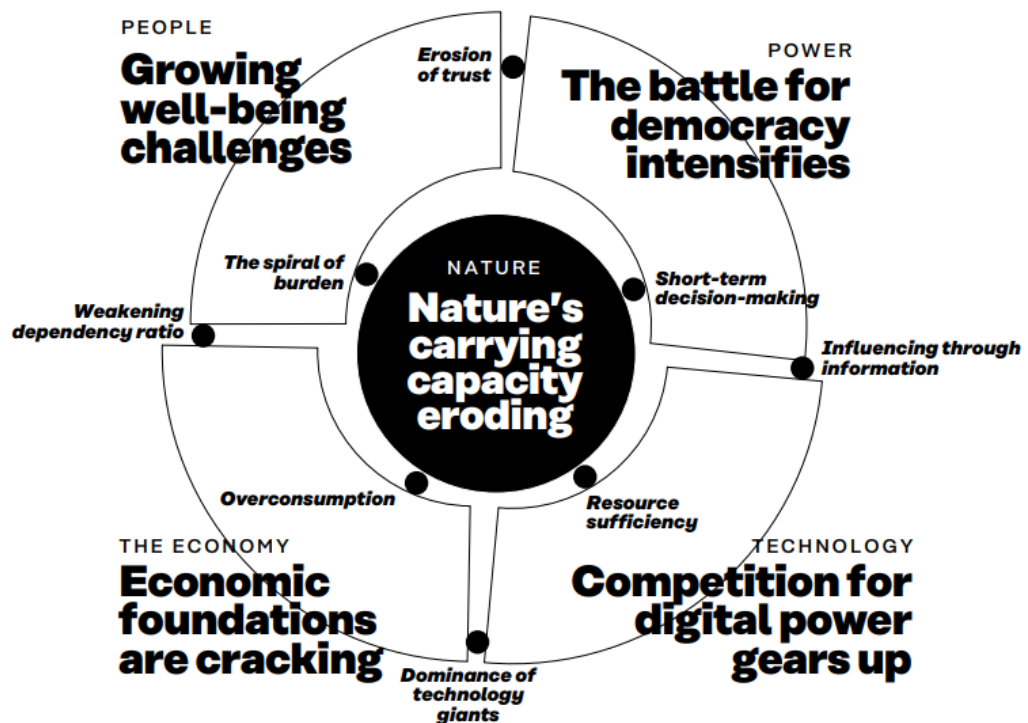


FIGURE 5. Sitra Megatrends 2023 Report: The big picture of change and the challenges to be addressed (Dufva & Rekola 2023).

As showcased by Sitra, all these challenges are interlinked, emphasizing the importance of understanding connections between different sustainability themes and how changes related to any of these may have immediate or less obvious long-term effects on others. For instance, our current financial system is based on the idea of continuous economic growth, which has had devastating impacts on nature and the global ecosystem. On the other hand, this system has led to an unforeseen accumulation of wealth and capital and has increased global life-expectancy, though it has benefited individuals unequally depending on factors such as geographical location, race, gender, and age. Green growth, eco-socialism, degrowth or any alternative economic model may be better for nature and people in the long-term but can also be problematic, as interconnections within our current system are often complex and the consequences of changes remain unknown or, at the very least, to some extent unpredictable (Dufva & Rekola 2023).

Sitra's report highlights the fact that we can influence the future by understanding the forces that will shape it and by taking corrective actions to turn desirable scenarios into reality. Having a vision for a preferred future state is necessary if we are to make it a reality one day. According to the report, to visualize this process, one must focus on three perspectives: *the push of the present* (observing changes that are occurring at this moment), *the weight of the past* (realizing what has happened before to create the current state) and *the pull of the future* (defining both desirable and undesirable futures while acknowledging underlying uncertainties). Only by acknowledging all three perspectives can we truly understand what futures may lie ahead (Dufva & Rekola 2023).

This approach is closely related to traditional risk management, and future thinking, as described by Sitra, can be a helpful tool when assessing sustainability risks and opportunities as a company. Intentionally focusing on the future state of things and long-term outcomes can also help mitigate present biases by, for instance, activating different brain regions associated with self-control (Sasseville et al. 2015). However, it should be noted that identifying risks and opportunities is only the first step of the risk management process. What is still needed, among other things, is to evaluate their financial (positive or negative) consequences and build a plan for mitigation, adaptation, and/or utilization. Only then do risk

management initiatives have a realistic possibility of making a difference and enhance companies' probability of making the best use of them.

2.6 COSO ERM Framework

The Committee of Sponsoring Organizations' (COSO) Enterprise Risk Management (ERM) Framework, firstly introduced in 2017, has been designed to help organizations understand and prioritize business-related risks and identify how a company's risks, strategy, and business operations are aligned. It is one of the most widely used risk management frameworks globally. In 2018, COSO and World Business Council for Sustainable Development (WBCSD) released guidance on how to apply COSO's ERM framework to manage sustainability-related ESG risks and to integrate a sustainability-approach into ERM processes.

The framework guidance introduces COSO risk management components and 20 principles that enable organizations to manage their sustainability-related business risks (both negative and positive). The five components are: 1) Governance and culture, 2) Strategy and Objective-setting, 3) Performance, 4) Review and Revision and 5) Information, Communication, and Reporting. To apply the framework for defining sustainability risks, one must follow the process based on these components (FIGURE 6).



FIGURE 6. COSO Risk Management Framework for sustainability-related risks (COSO & WBCSD 2018).

First, one needs to determine how risk management decisions are made and executed within the organization. The board of directors' and top management team's awareness of ESG-related risks must be addressed and improved, if necessary, to support those responsible for risk management and ensure a culture of collaboration within the organization. Next, the aim is to link company's strategy and business objectives to sustainability risks and define the organization's value-creation process to assess how these risks will influence business operations and the financial state of the company in the short-, medium- and long-term (COSO & WBCSD 2018).

The next step is to perform risk identification, assessment and prioritization of risks and to implement responses to the selected risks. According to COSO's ERM framework, a company should use appropriate tools such as SWOT and megatrends analyses, as well as impact and dependency mapping, to define how sustainability-related risks threaten the organization's strategy and business objectives. The best outcomes will be achieved if there is continuous collaboration between risk management and sustainability functions and a mutual understanding of what needs to be accomplished. Identified risks need to be assessed and prioritized accordingly while keeping in mind both short-term (often more visible) and long-term (more difficult to detect) sustainability risks. Following this, one must define the most effective risk responses based on an assessment of risk sources and the financial costs and benefits of each response option (COSO & WBCSD 2018).

An essential part of the ERM process designed by COSO is the continuous review and revision of risk management activities to evaluate their effectiveness and determine if modifications are needed. Using accurate metrics and indicators can help alert the organization to potential deficiencies in risk management and ensure that corrective actions are taken in a timely manner. Lastly, those responsible for risk management within the entity must assess the most appropriate ways to communicate and report on risks to both internal and external stakeholders to enable risk-informed decision-making within the organization (COSO & WBCSD 2018).

2.7 The integration of financial materiality assessment and ERM

Integrating current risk management principles, regardless of the risk management framework used within the organization, into the identification process of financial sustainability risks and opportunities is essential to ensure a successful outcome. In addition, identified actual and potential risks and opportunities must be communicated and endorsed throughout the organization to develop a plan on how to mitigate and adapt to these risks and opportunities accordingly. Without the support of all major business functions and their representatives, the company risks not only overlooking important insights from people regarding actual and potential risk factors that may be difficult to identify but also faces challenges in responding and acting without internal resistance and opposition.

Addressing sustainability risks and opportunities must be transparent and, if possible, should be based on the risk management practices already used by the company's management and financial department. However, as mentioned earlier, traditional enterprise risk management does not often capture what is essential to managing sustainability-related risks and opportunities. Thus, the integration of sustainability and enterprise risk management is highly recommended.

A study conducted by the World Business Council of Sustainable Development (WBCSD) in 2016 provides further insight into businesses' capabilities to detect sustainability risk signals and address them by utilizing existing risk management practices. The results of WBCSD's investigations revealed several challenges that companies tend to face when practicing sustainability risk management.

2.7.1 The challenges related to sustainability risk management

The WBCSD report identifies several challenges that organizations encounter when trying to practice sustainability risk management. Some of these are as follows (FIGURE 7): First, a lack of overall understanding of sustainability and organizations' inability to recognize business potential in the form of sustainability-related opportunities are seen as significant challenges. Moreover, inadequate cooperation between the sustainability function and enterprise risk management, and along with the longer outlook timeline associated with sustainability risks, can

prevent firms from detecting warning signals in a timely manner and developing a mitigation plan to respond to such risks. According to the study, sustainability risks are generally more challenging for companies to prevent and mitigate, and there is often no guidance provided by existing risk management frameworks on how to manage these risks (WBCSD 2016).

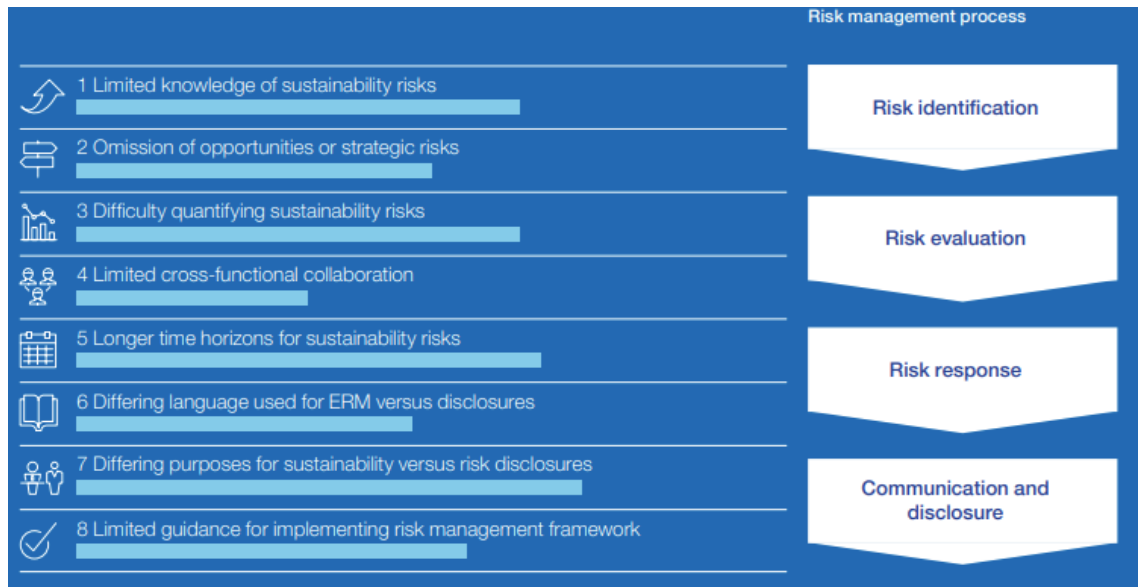


FIGURE 7. Factors that make it difficult to integrate sustainability risk consideration into the company's traditional risk management (WBCSD 2016).

Before integrating sustainability considerations into enterprise risk management, it is necessary to assess the role that ERM plays within the organization. The WBCSD states that ERM must operate in cooperation with other business functions, including the sustainability team, to detect and respond to external forces that could potentially impact the organization. This process includes disclosing these risks (and opportunities) to stakeholders, such as customers and investors, through annual and sustainability reports as well as legal risk filings (FIGURE 8.)

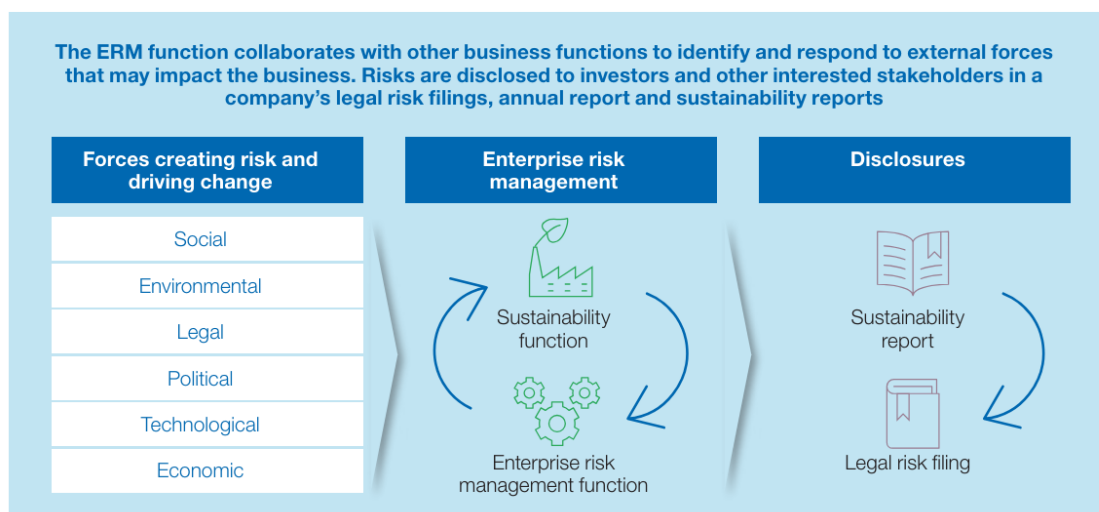


FIGURE 8. The role of ERM in an organization (WBCSD 2016).

The process, as displayed, can also be used when creating a sustainability report according to CSRD requirements. It should be noted that SMEs in particular may not have separate risk management or sustainability functions; instead, these responsibilities may be managed by, for example, the finance team and those responsible for executing company strategy and business model development. What matters is having a clear and transparent process that can be repeated and shown as being based on the organization's own design and considerations.

2.7.2 The identification of sustainability risks: Art versus science

The WBCSD report (2016) highlights the common view that risk management requires a balance between “art and science”. In other words, this refers to the extent to which one should emphasize a scientific approach when screening potential risks and opportunities versus when relying on intuition, or so called “gut feelings”. Building different scenarios and financial models can enable companies to detect several risks before they materialize, but relying on intuition can sometimes lead to better outcomes. For example, Gerd Gigerenzer (2015) has shown in his book on risk savviness that many experienced company executives and doctors tend to base their decisions on “gut feelings”, often yielding better results than relying solely on endless rational justifications. On the other hand, when utilizing gut feelings when making decisions, one should also be aware of the

underlying biases (such as confirmation and hindsight biases) that could affect the outcomes (Huang 2018, Visschers 2007)

When applied to the process of identifying and managing sustainability risks and opportunities, both scientific facts and intuition can be seen as having almost equal importance. This balance is essential because assessing sustainability risks/opportunities and their financial impacts requires future-oriented thinking and the ability to practice science-based reasoning. For an effective sustainability risk process in practice, it is essential to improve one's ability to manage and foresee the unknown. An art-focused approach might involve leveraging people skills, business acumen, or industry experience, whereas science-based tools and techniques to identify, evaluate, and monitor risks include forecasting, value versus risk analysis, as well as stress testing and risk quantification.

2.8 Risk management of sustainability-related risks

In addition to the recommendations already shared, there are various methods for companies to ensure effective management of sustainability-related risks. Several studies (incl. Kähkönen, Marttinen, Kontio & Lintukangas 2023; Wang-Mlynek & Foerstl 2020) show that collaboration and information-sharing with suppliers is one the key activities a company can undertake to detect, mitigate, and manage risks in its value chain more effectively. Furthermore, according to Liu (2019), a company's ERM philosophy and its clear communication to employees can improve their ability to actively mitigate risks. For such a philosophy to be effective, it must be both widely accepted and understood, taking into account the cultural and geographical backgrounds of the recipients (i.e., the organization's employees). Industry-specific risk management tools, as highlighted by Schulte and Knuts (2022), can enhance companies' abilities to identify and analyze sustainability risks as well as manage these strategically, thereby creating a growing awareness of the interconnections between sustainability and its implications for the organization's business performance.

Some researchers, including Antoncic (2019) and Jebe (2019), have emphasized that for the sustainability perspectives to be truly integrated into an organization's risk management framework, financial evaluations and assessments of financial

materiality must be included in the risk analysis process. This aligns well with ESRS, particularly the financial materiality assessment process, which is designed to work in this way. It should be noted, however, that the standards do not fully explain how to evaluate financial perspectives in practice, leaving it up to organizations to determine and test which approaches and potentially more detailed frameworks best suit their unique needs.

The conclusions of these studies imply that the same considerations identified as crucial for aligning risk management and sustainability risk management would also be useful when embedding risk management practices into the financial materiality assessment, especially when addressing actual and potential sustainability risks and opportunities. Next, one will review if and how different companies have applied these principles when conducting their financial materiality assessments.

3 ESSENTIAL TERMS

Below is a list of terms essential for understanding of both the CSRD reporting and financial materiality assessment requirements, as well as the adoption of enterprise risk management principles in the identification process of sustainability-related risks and opportunities.

TABLE 3. Essential terms concerning financial materiality assessment and enterprise risk management of sustainability risks and opportunities.

Corporate Sustainability Reporting Directive (CSRD)	Directive requiring large companies in the EU to disclose comprehensive sustainability information as part of their management and governance reporting
Non-Financial Reporting Directive (NFRD)	The predecessor to the CSRD, mandating certain large organizations to disclose non-financial information, including environmental, social, and employee matters, as well as anti-corruption and diversity practices
European Sustainability Reporting Standards (ESRS)	Standards providing detailed guidelines for companies to report sustainability information in line with the CSRD. These standards ensure comparability, consistency, and relevance in sustainability disclosures, covering environmental, social, and governance topics
Global Reporting Initiative (GRI)	Provides widely used standards for sustainability reporting, enabling organizations to transparently report their economic, environmental, and social impacts. Helping organizations understand and communicate their sustainability performance
European Financial Reporting Advisory Group (EFRAG)	Plays a central role in advising the European Commission on corporate reporting. EFRAG was instrumental in the development of the CSRD, including the creation of the European Sustainability Reporting Standards (ESRS), ensuring that sustainability reporting aligns with the EU's broader policy goals
Enterprise Risk Management (ERM)	The framework and process of planning, organizing, and controlling risk across an organization
Sustainability Risk Management (SRM)	Risk management framework focusing on managing risks associated with sustainability issues
Integrated Bottom Line (IBL)	A business strategy framework integrating financial, social, and environmental performance metrics
Triple Bottom Line (TBL)	A business strategy framework that considers social, environmental, and economic impacts (people, planet, profit)
Sustainability Risk Assessment (SRA)	The process of identifying, analyzing, and prioritizing risks related to environmental, social, and governance factors

World Economic Forum (WEF)	An international organization engaging business, political, and other leaders on global issues
World Business Council of Sustainable Development (WBCSD)	A global business association advocating for sustainable development
Double Materiality Assessment (DMA)	The concept developed to ensure that companies consider the full range of sustainability-related risks and impacts, offering a comprehensive view of how sustainability issues intersect with business operations and society. This approach is crucial for addressing complex global challenges like climate change and social inequality
Financial materiality assessment	The concept which ensures that companies disclose sustainability risks and opportunities that are financially relevant, enabling stakeholders to make informed investment and economic decisions based on how these factors affect the company's future financial performance
Megatrend	A large-scale, global, and long-term shift that significantly influences economic, social, environmental, and political systems over several decades. These trends are often transformative, shaping industries, markets, societies, and governments, and are typically driven by complex factors such as technological advancements, demographic changes, or environmental pressures
Black swan	A term used to describe an unpredictable, rare, and high-impact event that is beyond normal expectations and has profound consequences. These events are characterized by their rarity, severe impact, and the widespread tendency to rationalize their occurrence with hindsight, often labeling them as foreseeable after they have happened. The term was popularized by risk analyst Nassim Nicholas Taleb in his 2007 book <i>The Black Swan</i>

4 METHODOLOGY

This thesis is conducted using qualitative research methods. According to Alf H. Walle (2015, p.12), qualitative methods in research tend to “exert less control over subjects and the environments where observations take place” while also allowing “for more fluid and flexible procedures when recording data”. He further explains that this naturalistic research approach has been gaining interest within the global business community and increasing in influence and respectability among researchers (Walle 2015).

When it comes to utilizing in-depth interviews as a technique to conduct research in a more intimate, tailored, and detailed manner, Walle lists several associated benefits. For example, this research technique often results in unique responses, as the researcher uses open-ended questions and allows informants more freedom in providing their responses. Additionally, focusing on a few carefully chosen informants when arranging and scheduling interviews can be seen as a cost-effective way to collect valuable insights for the research. This is particularly true if the quality of data gathered through the interviews remains high (Walle 2015). These potential benefits are also acknowledged by Opdenakker (2006), who further stresses the importance of interpreting social cues during interviews (e.g., voice, intonation, and body language) to achieve the best possible outcomes.

As with any research method, one must be aware of the potential weaknesses qualitative research. For instance, when conducting in-depth interviews, one should avoid interrupting informants, allowing them to share their ideas and thoughts openly without breaking their chains of thought. It is equally important to plan the order of interview questions strategically, and in cases where sensitive questions are necessary (such as questions related to informants’ own performance and potential need for improvement), these should ideally be left until the end of the interview. The researcher should thus ensure that any questions which may have a negative impact on the conversation, will be asked only after the bulk of the interview (and questions that form the basis for gaining research data to be utilized later in the process) has already been finished. In addition, when selecting only a few informants to participate in interviews (as is often done when

conducting in-depth interviews), one must carefully assess the reputation, role, and expertise of these participants (Opdenakker 2006, Walle 2015).

The qualitative research method used in this study was planned with the above guidelines in mind. The materials gathered and analyzed in the literature review - consisting of sustainability reporting and risk management frameworks as well as reports on globally identified sustainability-related risks - formed the basis of the research. The key findings of the literature review were then supplemented by conducting semi-structured research interviews with three companies and their representatives. The objective was to combine both theoretical and empirical data, creating a more comprehensive perspective on the identification process of actual and potential financial risks and opportunities,

The goal of the research interviews was to outline how different companies are conducting financial materiality analyses in preparation for CSRD-based sustainability reporting requirements. The interview results are shared to provide guidance for other organizations required to complete a financial materiality assessment as part of their sustainability reporting initiatives. An essential part of the interview phase was seeking company representatives and industry experts who are currently responsible for or will soon be responsible for their organization's CSRD-based sustainability reporting, or who are otherwise involved in the process due to their knowledge of sustainability and/or risk management.

To obtain additional insights on the financial materiality assessment process, one arranged an additional interview with a senior sustainability consultant currently employed at Ecobio who, through her work, specializes in providing guidance for client companies on conducting a financial materiality assessment and utilizing risk management as part of the double materiality analysis process.

Semi-structured interviews were conducted with a total of three company representatives, each holding different roles and responsibilities within their organizations. The roles included Sustainability Manager, Compliance, Security & Risk Officer (CSRO), and Quality, Health, Safety and the Environment (QHSE) Manager. All company representatives are currently responsible for conducting their organization's sustainability reporting according to the ESRS. As some

representatives expressed concerns about the potential leakage of sensitive information and preferred to keep their identities and those of their organizations confidential, these details will not be disclosed in this thesis. Therefore, companies are referred to as Company A, Company B, and Company C. Similarly, company representatives who were interviewed are referred to as Interviewees A, B, and C, corresponding to the anonymized names of their organizations.

5 RESULTS

Next, one will present the key findings from the interviews including how interviewees described the process of conducting financial materiality assessments in their organizations, the most substantial benefits and challenges identified during the assessment process, how risk management principles were utilized in addressing financial materiality, as well as guidance and tips for companies that are yet to begin their financial materiality assessment activities. The emphasis will be on showcasing how companies required to report on their sustainability objectives and efforts should assess the financial materiality of different sustainability topics. Moreover, the aim is to define how the assessment process can serve company strategy formation and business model development instead of solely meeting the compliance requirements outlined in the CSRD.

5.1 Companies' sustainability reporting process status

Company A operates in the energy industry, where renewable energy sources and solutions, as well as other energy alternatives, are at the core of its business strategy and product offering. The organization, which is relatively small in terms of employee numbers, has recently completed its first ESRS-based double materiality assessment. It should be noted that Company A is not required to release its first report until 2026, which is why the company representative emphasized that this time the goal was more than anything else to become familiar with the standards and prepare for the actual and more compliant process that will take place in 2025.

Interviewee A has more than 15 years of experience in risk management and is now leading his organization's sustainability reporting process. He was mostly satisfied with the assessment outcomes, including how financial materiality was addressed, given that the whole concept was relatively new for many participants. However, he stressed that there is still a need to develop the process, as some generalizations had to be used when conducting the assessment. He further stated that companies without prior experience using sustainability reporting frameworks are unlikely to fully meet CSRD requirements when reporting for the first time, as there are simply too many details to consider. He expressed

concerns about how compliance with the requirements will be evaluated and questioned whether the parties responsible for evaluating companies' reports possess the necessary knowledge and capabilities to do so in a detailed manner. Furthermore, interviewee A views double materiality assessment practices as evolving over the years, particularly in relation to the company's own improved ability to assess materiality in a sustainability context.

Company A's double materiality assessment included internal workshops as well as workshops with external stakeholders. This time, the stakeholders involved were internal personnel, customers, owners, and company board members. Stakeholders were selected based on their availability, familiarity with the company's business and industry, and their overall importance to the business. A underlined that engaging all relevant stakeholders simultaneously would not be feasible, nor would it serve the assessment objectives, as resources for such activities are always limited. Next time, Company A plans to involve additional stakeholder groups, such as researchers and NGO representatives, as their expertise will certainly provide new perspectives and scientific insights, which would increase the transparency and reliability of the analysis results.

The organization's assessment process itself was as follows. First, the internal groups responsible for conducting the double materiality assessment analyzed the sustainability topics listed in the ESRS to identify clearly non-material matters. The next step involved internal workshops and stakeholder surveys, which further narrowed down the number of material sustainability topics. It should be noted that, so far, the assessment consisted only of evaluating the impact materiality of the different topics. Only after this phase were the chosen topics evaluated for financial materiality. According to A, this "prequalification" phase did not filter out many topics, so the list of topics for the financial materiality assessment phase remained nearly unchanged. This approach is not fully in line with the ESRS, which states, among other things, that sustainability topics can be material solely based on financial materiality. However, as previously mentioned, the goal at this stage was to become familiar with the principles of double materiality and gain practical experience to be used in the coming years, rather than aiming for full compliance with CSRD requirements.

When asked about potential time constraints, A and his organization, unlike some other companies, have decided to conduct the double materiality assessment and sustainability reporting on a rolling basis throughout the year. This approach considers factors such as personnel availability (including sick leaves and holidays) and includes critical analysis of how their involvement would impact daily work and business operations. Interviewee A shared his concern that completing the entire process within a 1–2-month period could negatively impact the company's business performance. He further emphasized that this year-round approach allows for more time to reflect and ensures that the process aligns as closely as possible with ESRS requirements.

Company B provides specialized solutions and expert services in controlled energetic applications across multiple countries. At the time of the interview, the company had nearly completed its double materiality assessment. Company representative B has worked in her current role as a sustainability manager for several years and previously held other roles within the same organization. When asked about the outcomes of the assessment, B stated that the material sustainability topics identified were the same as those defined in previous materiality assessments. The company has already addressed sustainability from different perspectives, completed three scope 1-3 carbon footprint calculations (covering the organization's entire value chain), designed a climate roadmap, and worked with external consultants to incorporate sustainability considerations into the company's business operations. In addition, to further deepen the overall understanding of sustainability and its implications for the organization's business goals and performance and to meet external parties' expectations, the company has previously conducted stakeholder surveys. This groundwork has prepared Company B for the upcoming reporting requirements, which the company must consider when preparing and releasing its sustainability report in 2026.

Company C, in turn, operates in the manufacturing industry, selling its products and services primarily in the European market. Company representative C stated that the double materiality assessment process has been partly completed, meaning that, so far, only the organizations' sustainability impacts (so called inside-to-outside effects) have been addressed according to the ESRS. Financial materiality has been assessed only by the finance and sustainability teams

without fully considering all details and requirements listed in the directive. However, previous internal workshops on sustainability within the organization have provided a strong indication of which sustainability topics are likely to be deemed material for the company. C has worked in her current role for many years but was only recently appointed with additional responsibilities related to sustainability activities. However, due to her current studies and personal interest in sustainability, she was already familiar with CSRD and sustainability reporting frameworks at the time of the interview.

C's primary concerns during the interview were related to meeting stakeholder engagement requirements outlined in the standards. She revealed that time and other resource constraints have hindered a more comprehensive assessment that considers various stakeholder views and opinions. According to her, certain social and environmental aspects are currently missing from the evaluation process, as well as the use of recent scientific evidence and support. She pointed out that there should be a stronger emphasis on making investments into research within the organization and contacting researchers who are specialized in topics such as biology and environmental economics. Additionally she noted that the company's management commitment and understanding of the reporting requirements and implications for business performance have not yet reached the level needed to achieve a fully compliant double materiality assessment.

5.2 Financial materiality assessment: Benefits and challenges

When asked about the financial materiality assessment and the most significant benefits and challenges it brings to companies, interviewees provided many interesting insights. A expressed that the terminology used in the ESRS differs somewhat from that used in risk management, and that the reporting guidelines provided by EFRAG are sometimes difficult to put into practice due to the limitations and constraints previously mentioned. He stated that identifying financial risks and opportunities related to sustainability topics is challenging, especially when trying to define potential risks and opportunities that require substantial understanding of underlying dependencies and scientific evidence. According to A, his company has so far determined a list of financially material sustainability topics and made an additional list of topics that require extensive scientific research

data and should therefore be addressed in more detail in the near future. For instance, understanding certain social sustainability factors and their financial implications for the company is extremely challenging to detect and evaluate. Overall, A felt that obtaining a more detailed picture of the company's sustainability-related financial risks and opportunities will require greater cooperation with the organization's value chain partners and increased engagement with researchers and representatives from NGOs in the assessment process.

Interviewee A emphasized that engaging with stakeholders is essential for a well-executed financial materiality assessment. In addition to providing valuable insights, engaging with external stakeholders also allows the company to promote sustainability and its significance to stakeholders, enabling active discussions and the formation of mutually beneficial partnerships.

One of the main challenges mentioned by A in assessing financially material sustainability topics for the company was defining the timeframe in which different risks and opportunities are expected to materialize. Moreover, the timescales provided in the ESRS do not fully align with the company's own strategy-setting practices. Because of this, A and his company decided to use their own timescales in the assessment to ensure that the results could be utilized more effectively when developing organizational strategy and/or risk management principles. A strongly believes that the results of the double materiality assessment, including financial materiality perspectives, should be embedded in the organizations' operational objectives. This is one of the main reasons why the responsibility for sustainability reporting in the organization has been given to the risk management function. A noted that traditionally, sustainability reporting has been placed under communication and marketing functions in many companies. According to him, the more detailed and science-based information requirements, as well as the risk management skills needed to address financial risks and opportunities, force companies to critically evaluate whether communication and marketing teams still have the resources and expertise required to report on sustainability.

Interviewee B did not encounter many challenges during the assessment process. One possible explanation for this is the nature of the company's value chain, which is much less complex than that of other companies subject to CSRD

regulations. B explained that the company mainly uses two suppliers, and its downstream value chain does not extend far due to the specialized nature of its products and services. Moreover, keeping the company's business operations profitable requires continuous development of procurement practices and cost analyses, which has resulted in having close partnerships with the organization's main suppliers. As a result, many sustainability-related risks and opportunities have already been identified, including those related to material scarcity and potential disruptions in the upstream value chain.

B noted that, although identifying sustainability-related financial risks and opportunities has consistently been part of the company's business strategy, especially risks related to social sustainability topics listed in the ESRS can be challenging to evaluate. Without giving specific examples from her own organization, she mentioned that this challenge could arise from a lack of expertise in addressing violations and hardships experienced by certain minority groups – issues with which those conducting the double materiality analysis may not be familiar. She also provided examples where socially unsustainable activities might lead to financial risks. The underlying cause-and-effect relationships may not be evident to individuals with limited understanding of fundamental social issues that could influence the outcomes of actions initially intended to have only positive effects.

When asked about the potential benefits and underlying challenges in conducting the financial materiality analysis, interviewee C's response aligned closely with A's. The financial materiality assessment process itself had been successful, but the team conducting it had to make many generalizations and simplifications along the way. She mentioned, for instance, that financial risks related to biodiversity loss were difficult to assess, as the scientific data required is still relatively scarce and challenging to analyze to the degree of accuracy required by the standards. Additionally, her organization lacks extensive understanding of some sustainability topics listed in the ESRS. However, the need to evaluate sustainability issues in detail has been eye-opening, which she views as the first step toward a more sustainability-oriented approach in the company's business practices. Currently, Company C is not fully committed to exceeding regulatory requirements for sustainability, but in the future, customer demands and the existence of directives such as CSRD and CSDDD (Corporate Sustainability Due

Diligence Directive) may push the company to become more ambitious in its strategic sustainability activities.

C also expressed hope that CSRD would have included a more detailed explanation of how to assess financial materiality, especially since many companies have no prior experience evaluating sustainability risks and opportunities. Many company employees who participated in the process also expressed concerns about the comparability of assessment results (and sustainability reports in general) between organizations within the same industry. C felt that this somewhat reduced the level of commitment within the organization during the assessment process, as people began to question the quality of the standards and the expertise of those responsible for preparing and issuing these standards (referring to EFRAG and the European Commission).

5.3 Risk management practices when assessing financial materiality

When it comes to the extent of using risk management practices and data in conducting financial materiality assessments, interviewees responses indicated major differences between the companies. This was partly due to the professional background of the interviewees; Interviewee A had an extensive understanding of risk management through his role, whereas the other two interviewees (B and C) had less experience in analyzing risks. Moreover, only Company A had appointed a risk management expert to lead the double materiality assessment process, while in companies B and C, the responsibility was given to sustainability and health and safety professionals.

A explained that his organization employs various risk management practices but noted, based on his experience, that adhering to an overly specific and inflexible risk management framework does not yield the best results. In his company, risk assessments are conducted every four months and are closely linked to the organizations' annual cycle and current business activities. He underlined that, when utilizing risk management expertise and practices the financial materiality assessments, it is essential to proceed in phases. Less material sustainability topics and associated risks that are initially pre-identified as such should not be assessed using detailed, time-consuming scenario analyses. Instead, the focus

should be on conducting a preliminary identification of the most relevant risks and opportunities. Only then should these be examined in more detail using sophisticated quantitative tools and analyses. A stressed that this “prequalification” approach to addressing sustainability-related risks is essential for achieving successful outcomes while also saving resources and time.

The approach A and his organization use to identify and assess potential sustainability-related risks and opportunities aligns well with COSO ERM Framework guidelines. As companies have limited resources for addressing risks, it is crucial to prioritize risks based on their specific nature early on and respond strongly to those risks deemed most severe based on the organization’s sustainability-topic expertise.

A also highlighted the importance of engaging stakeholders when assessing actual and potential sustainability risks and opportunities. Different stakeholders tend to identify and emphasize risks in unique ways, depending on their background and the level of expertise. Rather than viewing this as a hindrance, A believes that carefully analyzing the reasons behind these differences can reveal insights the company might not have foreseen or identified on its own. According to A, this approach can be highly beneficial when addressing sustainability risks, opportunities, and related dependencies between factors that are often difficult to define. He added that, in many ways, understanding the fundamental potential of such an approach is even more important than the immediate results of a single risk analysis process.

In Company B, there is no separate risk management function. Instead, risk management responsibilities are distributed across business units and their leaders/managers. Until recently, the focus of risk management practices was on strategic perspectives, with sustainability-related risks only now gaining more attention. The company has utilized certain risk analysis frameworks, particularly for evaluating security risks, but there is no specific ERM framework applied across the organization.

As mentioned, B’s company provides considerable independence to business function representatives in conducting their risk assessments. This principle also

applies to the financial materiality assessment process. Leaders of different business units, drawing on their in-depth industry knowledge and understanding of dependencies between factors such as price, technology, stakeholders, and raw materials, conducted their own risk analyses when considering sustainability-related financial risks and opportunities. The results were then reviewed collectively in a single meeting without additional analyses. Historically, this risk management model has succeeded in maintaining profitable business performance, even when unexpected events such as the war in Ukraine and rising operational costs have shaken the organizations' business capabilities. Then again, B noted that risks and opportunities associated with sustainability matters such as biodiversity and the circular economy have yet to be analyzed in detail, and the identification and management of these will be essential for the organization's sustainability strategy.

The question of whether B's organization can continue to rely on the expertise of business function representatives to assess sustainability-related risks and opportunities remains unanswered. Allowing business functions significant independence in addressing risks and opportunities can foster a culture of collaboration in the organization (a vital part of the COSO ERM Framework concerning governance and culture). Moreover, a strong understanding of business context, strategy and objectives is necessary to effectively plan and implement ERM activities that also serve the identification and management of sustainability-related risks and opportunities. On the other hand, simply trusting the organization's ability to manage such risks and opportunities solely based on the prior experience could be risky. Since this topic was not covered in the interview, it is difficult to estimate the extent to which key individuals within the organization understand global megatrends related to sustainability or how different cause-and-effects are addressed in making risk analyses as part of financial materiality assessments. What can be said however, is that none of the materials listed in the literature review of this study were mentioned as a method to practice sustainability risk management.

Company C also lacks a specific risk management framework for defining financially material sustainability risks and opportunities. Interviewee C explained that this is partly due to recent organizational changes and a shortage of personnel in

certain roles, including the sustainability team. She felt that assessing sustainability risks and opportunities, as well as their effects on business performance, requires knowledge that the organization currently lacks to some extent. The company has used external consultants thus far, but C underlined that stakeholder demands and increased sustainability reporting regulations are driving the organization toward more permanent solutions, such as creating new roles and redefining current practices related to risk management. She also mentioned that forming industry cooperatives and engaging more closely with stakeholders when assessing industry-specific and company-specific sustainability risks and opportunities would provide a better understanding of the actual and potential risks associated with the topics included in the ESRS.

Company C is clearly in a stage that does not allow it to fully utilize existing frameworks to identify and manage risks and opportunities related to sustainability. Recent organizational changes, coupled with a lack of sustainability and risk management expertise, make it challenging to assess financially material topics for the company. In addition, the decision-making processes related to sustainability considerations within the organization remain unclear. Using external resources appears to be the only viable option for conducting a financial materiality assessment based on a detailed risk identification and management process.

5.4 Recommendations for other companies

All the interviewees were asked to share their recommendations for companies that are still in the process of starting their own financial materiality analyses. Interviewee A highlighted the importance of involving a wide variety of stakeholders in the process and engaging company employees by showcasing how the assessment findings and results, as well as the increased understanding of risks and opportunities, can benefit them in their roles. He continued, outlining that the risk assessment analysis, as well as the entire double materiality assessment process, should be viewed as an opportunity to develop business strategy and enhance organizations' competitiveness in the marketplace rather than solely as a compliance exercise.

B shared A's notion that engaging people in the process is crucial for ensuring successful materiality assessment outcomes. She recommended showcasing the potential financial benefits as well as highlighting the negative consequences of failing to meet the standards' requirements. The goal should be to embed the sustainability agenda into everyone's responsibilities in the workplace, thus encouraging people to make decisions through a sustainability lens. This shift will not happen instantly but requires repetition and continuous communication. As a result of these efforts, tasks related to sustainability considerations – such as those required by the double materiality assessment and risk management analyses - will eventually become more familiar and widely accepted across the organization.

C expressed the belief that very few organizations are fully prepared to conduct a financial materiality assessment that would enable them to convincingly report on their sustainability risks and opportunities related to ESRS-listed topics. According to her, on a European scale, there is a lack of sustainability and risk management expertise, as well as financial and technological resources, to complete analyses that consider all underlying dependencies in sustainability considerations. This is why organizations need to approach the assessment of financial materiality gradually, first utilizing data and knowledge already available internally, and then critically evaluating the most relevant development needs. Current risk management practices should be aligned with the process of analysing financial risks and opportunities in the sustainability context, as these can also serve other objectives, thus bringing sustainability in as a key factor when updating the company's overall business strategy.

In her opinion, the tight timeline not only for addressing double materiality but also for completing a CSRD-compliant sustainability report pushes companies to seek best practices from industry leaders and even close competitors. At the same time, these time pressures compel these companies to build their internal expertise by creating new roles and hiring new talent for both finance and sustainability teams. Using external consultants and researchers - whether specializing in sustainability, risk management, or for example, environmental management - is essential for many organizations in the short-term until their internal capabilities are more developed.

5.5 The insights and tips from senior sustainability consultant

To provide a more comprehensive view of how companies can incorporate risk management principles into their financial materiality assessments, one arranged an interview with the senior sustainability consultant at Ecobio, Katrine Hoset. Hoset has an extensive understanding of sustainability reporting standards and frameworks, as well as a research background in behavioural and population ecology. At Ecobio, she specializes in guiding clients on interpreting various sustainability reporting frameworks and applying the reporting guidelines in practice. In addition, she is involved in developing Ecobio's digital sustainability reporting tool, through which she has gained a foundational understanding of risk management, including identifying risks related to chemical exposure and occupational health.

In the interview, Hoset was first asked to provide general tips for companies starting their financial materiality assessments. She noted that Task Force on Climate-Related Financial Disclosures (TCFD) framework introduces several sustainability-related risks that MAY be relevant in certain industries. TCFD is particularly useful because it also offers tools for conducting risk scenario analyses and provides a methodology that can be utilized in practical risk assessment work.

She also emphasized the importance of completing the impact materiality assessment before diving into the identification financial risks and opportunities, as this tends to reveal early signals of relevant dependencies and both positive and negative risks that could be analyzed further when addressing financially material risks and opportunities. For the risk assessment itself to be as detailed as possible, using a digital tool that allows for a certain degree of automation and the handling of large data volumes is highly recommended. This is particularly essential for organizations with complex, multi-continent value chains.

Hoset highlighted the importance of creating connections between traditional risk management and the assessment of sustainability-related risks in sustainability reporting. She stated that, ultimately, it does not matter much by whom and through what process sustainability-related risks and opportunities have been

identified. What matters is to communicate about latest findings and thus, share information that benefits the whole organization. For instance, the financial materiality analysis can leverage sustainability risks previously identified through strategic reviews and risk mapping, while the results of double materiality analysis may reveal significant, even existential, risks to the organization that traditional risk management methods might miss. She also raised the question of whether these two approaches should be entirely merged in the future, given that most long-term risks, as outlined in the Global Risk Report 2023, are sustainability related. This suggests a need to evaluate sustainability factors in all company decision-making. Hoset stressed that CSRD-based sustainability reporting should be viewed as a gradual process in which companies improve their understanding and accuracy in small details over time.

Hoset agreed that traditional risk management frameworks may not be equipped to identify actual and potential long-term sustainability risks. In addition, it is known that humans tend to prioritize short-term risks over long-term risks (Ainslie 1975; Kahneman & Tversky 1979; Jones & Millner 2021). This tendency is also evident when assessing how individuals, companies, and even governments respond to environmental and sustainability concerns, often resulting in delays and inaction (Weber 2006; Weber & Stern 2011). Long-term risks are frequently, as shown by the Global Risk Report 2023, associated with environmental and social concerns. Hoset underlined that while this is a major challenge, awareness of it is the first step toward developing better practices. Practically, this could mean holding internal sessions where employees critically evaluate whether long-term perspectives have been considered in assessing risks and opportunities, and if not, identifying the cause. This question is also what makes directives such as CSRD so vital, as they introduce sustainability perspectives (such as double materiality) as having value equal to traditional risk management factors.

When asked about forming the ideal team for the assessment of financial materiality, Hoset suggested dividing key responsibilities between finance, sustainability, and risk management teams. She advised companies without a history of sustainability and material assessments to consider hiring external consultants. Having the company CFO directly or indirectly involved can add a sense of urgency and emphasize the importance of taking immediate action.

Hoset emphasized the importance of defining the company's goals at the outset of the double materiality analysis process. Establish a clear purpose and setting strategic objectives for the analysis - beyond simply meeting regulatory compliance – can serve other strategic functions within the organization. Viewing financial materiality assessment as more than a reporting necessity is likely to distinguish organizations that see sustainability as a strategic enabler from those that focus solely on meeting minimum requirements. Stakeholders, including current and future investors, are looking for transparent and detailed information on companies' ability to manage sustainability-related risks and opportunities. Rather than superficial achievements and promoting campaigns, investors are most interested in an organizations' ability to set realistic and achievable strategic goals based on detailed analyses and expertise. This is also emphasized by the The Carbon Disclosure Project (CDP) in its 2022 Global Supply Chain Report. Hoset advised that such expectations should be considered when completing the assessment of sustainability-related financial risks and opportunities and deciding how to communicate the results in sustainability reports (CDP Global Supply Chain Report 2022).

6 DISCUSSION

In this chapter, the study results will be analyzed by utilizing material from the literature review as well as key insights from the semi-structured interviews. Furthermore, the reliability of the research will be addressed by assessing factors such as the research method used and sources that formed the basis for the study. Possibilities for conducting future studies based on the findings presented in this paper will also be considered. Thus, the emphasis will be on assessing the overall value of the research and how the findings could be used by others in the future.

6.1 The analysis of the interviews

The interviews revealed that different companies approach the assessment of financial materiality and utilize risk management principles in significantly varied ways. Company A assigned the responsibility for the assessment to a risk management specialist, which is reflected in the degree to which risk management is embedded in the assessment process. In contrast, Company B does not have a separate risk management department; sustainability reporting, including managing sustainability risks and opportunities, is the responsibility of the sustainability manager. Additionally, risk management responsibilities have been distributed among managers of various business units, who primarily rely on their extensive organizational and industry expertise. Company B has also sought external consultation to enhance its sustainability capabilities, and as stated by interviewee B, sees future phases in reporting (such as data gathering and reporting automation) as greater challenges than the analysis of sustainability-related risks and opportunities.

Company C is currently developing a model for the assessment of financial materiality and risk management but continues to face challenges in filling roles related to these essential needs. Furthermore, interviewee C expressed concern about time pressure and resource constraints posed by strict sustainability regulations. She also questioned whether the small details required in sustainability reports might detract from the actual sustainability agenda, a notion briefly echoed by other interviewees.

A common theme among all companies was the management team's commitment to investing in sustainability initiatives and viewing sustainability reporting, at least to some extent, as a strategic enabler rather than merely a compliance-driven exercise. Interviewee A shared that he and his team continually provide the rest of the organization with updates on the sustainability reporting process and key takeaways. Interviewee B reported that her company personnel's business understanding enables them to focus on the most relevant challenges. The independence granted to business unit managers in assessing financially material sustainability topics for the organization could also indicate trust between these managers and the sustainability function, potentially increasing their commitment to the process. However, the level of sustainability-specific knowledge and risk management expertise among business unit managers is unclear, as Interviewee B's examples of managing business risks seemed to draw more on general business context than on specialized knowledge in sustainability risk management.

In her interview, C indicated that many key components needed for successful sustainability reporting are missing due to resource limitations, though these deficiencies have been identified and are being addressed. The fact that Company C is not required to report according to CSRD until 2026 provides some time for further development and internal organization.

Many factors mentioned by interviewees are very much in line with what the COSO Risk Management Framework for sustainability-related risks lists as key principles to detect and manage sustainability risks from financial perspective. On the other hand, the question remains as to whether companies can effectively identify sustainability risks, opportunities, and dependencies within a complex network of interrelated factors. If traditional risk management frameworks and the human tendency to prioritize short-term risks (as underscored by the Global Risk Report 2023) prevent us from effectively visualizing and communicating these risks, uncertainties in assessing financial materiality comprehensively will persist.

It is also unclear to what extent the interviewees and their organizations have managed to detect how different sustainability risk and opportunity factors are

interrelated and interconnected in their financial materiality assessments. Moreover, there is no clear understanding of how the analysis of impact materiality has influenced the identification of risk and opportunities and the recognition of early signals and dependencies related to sustainability concerns. As demonstrated by the WEF's Global Risks Report (2023) and Sitra's Megatrends Report (2023) and stressed by Katrine Hoset, the ability to interpret weak signals and identify fundamental cause-and-effect relationships - either through traditional risk assessment processes or through impact materiality assessment before analyzing financially material sustainability topics - is essential for comprehensive sustainability risk identification as part of financial materiality assessment.

6.2 The analysis of research method and available sources

First, it must be noted that analyzing the concept of financial materiality assessment and determining how risk management frameworks and guidelines can be utilized in the assessment process turned out to be a challenging task. During the research, it became clear that the ESRS standards provided by the European Commission allow for a substantial degree of interpretation. At the time of the research, additional implementation guidelines on topics such as conducting the double materiality assessment were provided by EFRAG. However, some questions regarding the implementation of financial materiality assessment remain to be answered. This ambiguity has also complicated the evaluation of how existing risk management frameworks and resources, from parties like the World Economic Forum (WEF) and the World Business Council of Sustainable Development (WBCSD), could be applied practically. In addition, the lack of sector-specific sustainability standards and the differences in terminology between ESRS financial materiality assessment guidelines and current ERM and other risk management frameworks make it difficult to provide a practical guidance on approaching the concept of financial materiality through traditional risk management perspectives.

Despite these limitations, there are still resources available to help incorporate risk management into the process of financial materiality assessment. In addition to sources introduced in the literature review (such as COSO ERM with ESG integration) and those mentioned in interviews (referring to TCFD Framework and

EU Taxonomy), other references like the Sustainability Accounting Standards Board (SASB) standards and the ISO 31000:2018 risk management framework could be helpful for companies with limited experience in sustainability risk management.

Given the complex and evolving nature of CSRD, it is not surprising that some assumptions and interpretations made in this study may later be considered questionable or incorrect. The directive and its standards will likely change over time with the introduction of sector-specific standards or other adjustments to improve feasibility among European companies.

Second, the limitations of semi-structured interviews must be acknowledged, as they do not provide a comprehensive understanding of how to leverage existing risk management practices, materials, and frameworks when conducting financial materiality assessment. None of the interview participants expressed complete confidence that their assessment was fully compliant with CSRD requirements. This uncertainty is partly due to the potentially differing demands from independent auditors who will verify the companies' sustainability reports beginning in 2025. Furthermore, while all interviewees had some experience with previous sustainability standards (such as GRI), they had only recently been introduced to the content of CSRD. Combined with the limited availability of widely recognized sustainability-focused risk management protocols and frameworks and the questionable ability of humans to prioritize long-term risks, can result in major deficiencies in organizations financial materiality assessment results.

Lastly, one must critically evaluate his own knowledge and understanding of the topic. As mentioned, CSRD and associated ESRS can be interpreted in various ways, and the researcher's own underlying biases and assumptions can have a negative influence on the reliability of the research results. These considerations are especially relevant regarding the references used in the literature review. To add, the results of semi-structured interviews were strongly influenced by the interviewer's own perceptions on the topic, prior experience as a sustainability consultant, and underlying expectations concerning potential interview results.

6.3 Recommendations for future research

The results of the study raise several unanswered questions that could be explored through future research. The question of how to integrate risk management into financial materiality assessment may be addressed more thoroughly after the first wave of companies reporting under CSRD have released their sustainability statements at the start of 2025. The detailed description of the double materiality assessment process required by ESRS pushes companies to share their assessment practices and materials. This publicly available information could provide valuable insights into the extent to which risk management expertise and sustainability-focused analyses are utilized in financial materiality assessments. Thus, future researchers will have more practical data for detailed analysis on implementing sustainability risk management within financial materiality assessments.

Another potentially interesting research direction would be to examine the actual and most common challenges for companies that have conducted the financial materiality assessment more than once. That is, one could assess and make comparison between the challenges mentioned in this and earlier studies and the challenges that companies seem to face after the principles of financial materiality assessment have already been understood and the practicalities of integrating sustainability perspectives into traditional risk management internalized.

7 CONCLUSIONS

This study paper has presented several materials, frameworks, and methods to enable companies to embed risk management principles into the financial materiality assessment process. For any company intending to identify financially material sustainability topics in accordance with the ESRS guidelines, it is essential to first understand the importance of risk management for achieving a successful outcome and, secondly, to utilize enterprise risk management frameworks designed to emphasize sustainability-related risks and opportunities. In addition, becoming familiar with global risk reports, which highlight risks projected to shape the world, ensures that financial materiality assessments incorporate these perspectives. The ability to anticipate potential future developments, interpret weak signals related to global megatrends, and act proactively in order to achieve a preferred future state not only supports the financial materiality assessment process but also equips companies to adapt their strategies and business models based on the findings. This is fundamentally one of the key objectives of CSRD and the reason why publishing sustainability statements has become a requirement for so many companies within EU zone.

Acknowledging the structure and content of previously released frameworks that have influenced the double materiality assessment design is advisable, as previously mentioned. Focusing on the principles of these frameworks can help companies understand why and how risk assessment should be incorporated into analysing the financial materiality, filling some of the gaps detected of ESRS's subject matter guidance.

The semi-structured interviews conducted as part of this study provided insights into how some middle-size Finnish companies have approached the double materiality assessment requirement, including financial materiality assessment process, in practice. Moreover, the inclusion of comments and tips from an experienced senior sustainability consultant addressed the research questions in much greater depth. It is hoped that these insights provide a clear path for companies yet to begin or finalize their identification project of sustainability-related risks and opportunities as part of their double materiality assessment process.

It should be noted that more practical guidelines on conducting the financial materiality assessment will likely be available in 2025 as companies required to publish their CSRD-based sustainability statements begin to do so. Furthermore, both the European Commission and EFRAG are expected to release more detailed information on how to address the financial materiality assessment, including risk analysis considerations, in the near future (as already done in the form of additional guidelines concerning for example how to examine a company's value chain when conducting the double materiality assessment).

This study has also raised concerns about our ability to assess sustainability-related risks and opportunities, particularly due to the tendency to prioritize short-term risks over long-term ones. This combined with the relatively limited availability of sustainability risk management materials, may result in superficially and poorly executed financial materiality assessments. Such shortcomings could, in turn, potentially impact the quality of companies' sustainability statements and, ultimately, result in delays in integrating sustainability as a critical component of companies' strategies and business model. Thus, perhaps the most important goal of CSRD would not be achieved as has been planned.

REFERENCES

Ainslie, G. 1975. Specious reward: A behavioral theory of impulsiveness and impulse control. *Psychological Bulletin* 82 (4), 463-496.

Antonicic, M. 2019. Why sustainability? Because risk evolves and risk management should too. *Journal of Risk Management in Financial Institutions* 12 (3), 206-216.

Anderson, D. R. 2006. The critical importance of sustainability risk management. *Risk Management* 53 (4), 66-72.

Anderson, D. R., & Anderson, K. E. 2009. Sustainability risk management. *Risk Management and Insurance Review* 12 (1), 25.

Bell, J. & Lundblad, H. 2011. A comparison of ExxonMobil's sustainability reporting to outcomes. *Journal of Applied Business and Economics* 12 (1), 17-29.

Boulding, K. E. 1966. The economics of the coming spaceship earth. *Resources for the future*. 1-14.

Brundtland, G. H. 1987. Our common future—Call for action. *Environmental conservation* 14 (4), 291-294.

Carbon Disclosure Project (CDP). 2022. CDP Global Supply Chain Report. Accessed 6.4.2024: <https://www.cdp.net/en/research/global-reports/scoping-out-tracking-nature-across-the-supply-chain>

Carson, R. 1962. *Silent Spring*. Hamilton.

Cole H.S.D., Freeman C., Jahoda M. & Pavitt, K. L. 1973. *Thinking about the future: A critique of the limits to growth*. Chatto and Windus for Sussex University Press, London.

Committee of Sponsoring Organizations of the Treadway Commission (COSO) & World Business Council of Sustainable Development (WBCSD). 2018. *Enterprise Risk Management. Applying enterprise risk management to environmental, social and governance-related risks*. Accessed 17.1.2024: <https://wbcSD.my.salesforce-sites.com/CampaignSubscription-Page?id=7010N0000011RPE>

Dufva, M. & Rekola, S. 2023. *Megatrends 2023. Understanding an era of surprises*. Sitra. Accessed 26.11.2023: https://media.sitra.fi/app/uploads/2023/03/sitra_megatrends-2023_v3.pdf

Elkington, J. 1998. Partnerships from cannibals with forks: The triple bottom line of 21st-century business. *Environmental quality management* 8 (1), 37-51.

European Financial Reporting Advisory Group (EFRAG). 2024. *Implementation Guidance 3. List of ESRS datapoints. Explanatory note*. Accessed 6.6.2024:

<https://www.efrag.org/Assets/Download?assetUrl=/sites/webpublishing/SiteAssets/EFRAG+IG+3+List+of+ESRS+Data+Points+-+Explanatory+Note.pdf>

European Commission. 2023. Commission Delegated Directive (EU) .../ amending Directive 2013/34/EU of the European Parliament and of the Council as regards the adjustments of the size criteria for micro, small, medium-sized and large undertakings or groups. Accessed 2.1.2024: [https://ec.europa.eu/transparency/documents-register/detail?ref=C\(2023\)7020&lang=en](https://ec.europa.eu/transparency/documents-register/detail?ref=C(2023)7020&lang=en)

European Commission. 2023. Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards. Official Journal of the European Union. Accessed 2.1.2024: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202302772

European Commission. 2021. Proposal for a Corporate Sustainability Reporting Directive (CSRD). Accessed 21.4.2024: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021PC0189&from=EN>.

European Green Deal. N.d. European Commission. Accessed on 5.12.2023: https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

Gigerenzer, G. 2015. Risk savvy: How to make good decisions. Penguin.

Gokten, S., Ozerhan, Y. & Gokten, P. O. 2020. The historical development of sustainability reporting: A periodic approach. *Zeszyty teoretyczne rachunkowości* 107 (163), 99-118.

Hopwood, B., Mellor, M. & O'Brien, G. 2005. Sustainable development: mapping different approaches. *Sustainable Development* 13 (1), 38-52.

Huang, L. 2018. The role of investor gut feel in managing complexity and extreme risk. *Academy of Management Journal* 61 (5), 1821-1847.

Jebe, R. 2019. The convergence of financial and ESG materiality: Taking sustainability mainstream. *American Business Law Journal* 56 (3), 645-702.

Jones, B. A. & Millner, A. 2021. Social discounting and the challenge of global public goods. *Nature Human Behavior* 5 (8), 1020-1030.

Kahneman, D. & Tversky, A. 1979. Prospect theory: An analysis of decision under risk. *Econometrica* 47 (2), 263-291.

Kim, I. 2002. Ten years after the enactment of the Oil Pollution Act of 1990: A success or a failure. *Marine Policy* 26 (3), 197-207.

Kähkönen, A-K., Marttinen, K., Kontio, A. & Lintukangas, K. 2023. Practices and strategies for sustainability-related risk management in multi-tier supply chains. *Journal of Purchasing and Supply Chain Management* 29 (3), 100848.

Lecomber, R. 1975. *Economic growth versus the environment*. MacMillan, London.

- Liu, X. 2019. The role of enterprise risk management in sustainable decision-making: A cross-cultural comparison. *Sustainability* 11 (10), 2939.
- Meadows, D. H., Meadows, D. L., Randers, J., & Behrens III, W. W. 1972. *The Limits to Growth - Club of Rome*. Switzerland.
- Morgan, J. D. 1994. The Oil Pollution Act of 1990: A look at its impact on the oil industry. *Fordham Envtl. LJ*, 6, 1.
- Opdenakker, R. J. G. 2006. Advantages and disadvantages of four interview techniques in qualitative research. In *Forum Qualitative Sozialforschung=Forum: Qualitative Social Research* 7 (4), art-11. Institut für Klinische Psychologie and Gemeindesychologie.
- Palousis, N., Luong, L., & Abhary, K. 2010. Sustainability risk identification in product development. *International Journal of Sustainable Engineering* 3 (2), 70-80.
- Sasseville, A., Green-Demers, I., Leduc, C., Leger, P. M. & Senecal, S. 2015. Future-oriented cognition and temporal discounting: The role of executive functioning in self-control. *Neuropsychologia* 75, 431-439.
- Schulte, J., & Hallstedt, S. I. 2018. Company risk management in light of the sustainability transition. *Sustainability* 10 (11), 4137.
- Schulte, J. & Knuts, S. 2022. Sustainability impact and effect analysis – A risk management tool for sustainable product development. *Sustainable Production and Consumption* 30, 737-751.
- Taleb, N. N. *The Black Swan*. Penguin Books, Harlow.
- Visschers, V. H. M. 2007. Gut feeling versus common sense: Associative and cognitive processes in risk perception and communication. Accessed 5.7.2024: <https://cris.maastrichtuniversity.nl/ws/portalfiles/portal/1322055/guid-42fcf151-7ef0-40ec-9c6b-accadeae18ce-ASSET1.0.pdf>
- Walle, A. H. 2015. *Qualitative research in business: A practical overview*. Cambridge Scholars Publishing.
- Wang-Mlynek, L. & Foerstl, K. 2020. Barriers to multi-tier supply chain risk management. *The International Journal of Logistics Management* 31 (3), 465-487.
- Weber, E. U. 2006. Experience-based and description-based perceptions of long-term risk: Why global warming does not scare us (yet). *Climate Change* 77 (1-2), 103-120.
- Weber, E. U. & Stern, P. C. 2011. Public understanding of climate change in the United States. *American Psychologist* 66 (4), 315-328.
- World Business Council of Sustainable Development (WBCSD). 2016. *Sustainability and enterprise risk management: The first step towards integration*.

Accessed 2.2.2024: https://integratedreporting.ifrs.org/wp-content/uploads/2017/01/WBCSD_Risk_Publication_20161.pdf

World Economic Forum (WEF). 2023. Global Risks Report. Accessed 4.3.2024: <https://www.weforum.org/publications/global-risks-report-2023/>

APPENDICES

Appendix 1. Semi-structured interviews: Interview structure

1. **Introductions and presentation of the thesis topic**
2. **The interviewee's current role/Position in the company and experience with the Topics Discussed** (Handled anonymously in the actual work)
3. **CSRD and the assessment of financial materiality – How is the company represented by the interviewee conducting financial materiality assessments in compliance with CSRD and ESRS?**
 - a. Current practices/status of materiality assessment
 - b. The current status of financial materiality assessment - How has it been implemented/is it being implemented? How is the value chain defined in the company's assessment? Determination of financial thresholds and identification of dependencies
 - c. Key findings/observations identified at this stage regarding financial risks and opportunities
4. **Risk Management in the company: Models and frameworks used**
5. **Utilization of Risk Management and the models/frameworks used in the financial materiality assessment**
 - a. Models/frameworks used in the company, process description (management, responsible persons, involvement of different business units in the company)
 - b. Actual risks/opportunities and potential Risks/opportunities for the company
 - c. Identified strengths/challenges/development measures for the company
 - d. ERM (Enterprise Risk Management) vs. SRM (Sustainability Risk Management)

e. Implementation in the future and insights/tips for other companies

6. Summary and additional questions/remarks