



Materiality assessments in corporate sustainability and financial reporting: Connectivity, practices, processes, and challenges

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Key findings

The various definitions of materiality in the sustainability reporting arena are linked to the standard setters' conceptions of the purpose and perceived users of sustainability reporting. The connectivity of social and environmental issues that are material from an impact perspective and a financial perspective remains unclear, as is the extent to which social and environmental impacts and dependencies affect financial reporting practices. In this context, we highlight some of the key findings of this project.

1. Materiality assessment: current practices

- Not all companies are transparent about their materiality assessment process, yet those that disclose it undertake different approaches in sustainability reporting: 83% of the 225 companies adopt a double materiality approach, 13% adopt an impact materiality approach, and the remaining 4% adopt a financial materiality approach.
- There is not overwhelming evidence of misalignment between which sustainability issues are deemed as most material across sustainability and financial reports, but we observe some misalignment for corporate governance and environmental issues.

2. Double materiality: current challenges

- Technical challenges mainly relate to determining materiality thresholds, considering time horizons and stakeholders' knowledge and expertise.
- Cultural challenges may arise where sustainability issues are not regarded as core to the business, and this is further exacerbated when sustainability reporting teams are not integrated with financial reporting units.
- Institutional challenges reflect the current fragmentation of sustainability reporting standard setting such that companies need to reconcile or at least navigate guidance from multiple sources.

3. Connectivity

Different factors undermine the adoption of the traditional conceptualisation of materiality in the sustainability reporting domain, with reference to multiple users' information needs, diverse time horizons and the inherent uncertainty and complexity of the sustainability issues that need to be accounted for.

- Double materiality implies that issues are deemed material when they are material from an impact or financial materiality perspectives, but connectivity is enhanced when the two materiality assessments build on each other. Specifically, the definition of material topics should start from an impact materiality perspective. Then, the list of identified topics should also be assessed from a financial materiality perspective to allow considering which sustainability impacts may have financial implications. However, the underlying processes for sustainability and financial reporting are often siloed and disconnected, suggesting a lack of connectivity between sustainability and financial reporting. Regulation is yet deemed a factor encouraging greater connectivity between the two reporting processes.

- The identification of material impacts is challenged by the lack of active engagement with stakeholders possessing the relevant expertise needed to identify key social and environmental impacts.
- The notions of risk and corporate governance are useful to connect impact and financial materiality.
 - Climate change as a financial risk is an example of a sustainability issue enhancing the connectivity between sustainability and financial reporting.
 - Companies that implement corporate governance processes, such as setting up board-level committees that directly engage in materiality assessments and discuss sustainability issues, foster an understanding of the strategic implications of material sustainability issues.

4. Implications

- Foster cooperation between corporate sustainability and financial reporting teams to enable connectivity between both reporting arenas. This collaborative work would not only improve materiality assessments but also contribute to increasing the awareness of the information produced by both teams.
- A broad stakeholder base should be consulted through active and bidirectional engagements to identify which sustainability topics are material from an impact or financial materiality perspective. Organisations should ensure a fair representative stakeholder base of knowledgeable external and internal stakeholders.
- Users of corporate reports need to be cognisant that sustainability information may be disclosed in different locations. Both corporate governance and risk are key elements through which organisations may navigate complex sustainability issues and so users need to pay particular attention to these within their considerations.
- Users need to engage with the materiality assessment process and bring an informed perspective to this process. This requires an undertaking to develop their understanding of the sustainability context and its complexity.
- Standard setters should continue to cooperate to ensure compatibility across reporting standards and provide clear guidance on how materiality is to be understood and the process that organisations should establish to carry out materiality assessments. Guidance is needed in the key challenges that currently affect practice, such as the determination of thresholds, or the quantification of impacts, to ensure the robustness and consistency of those processes.

Foreword

Traditionally, the primary audience for the annual report and accounts, including the management commentary and other reports commonly included, are the company's investors. The assumption that financial stakeholders are the principal audience for corporate reporting has been reinforced by the IFRS Foundation linking the usefulness of reported information to investment decision-making, a concept that has also been adopted by the FRC. For corporate reports to be useful for decision-making, the information they contain, beyond that specifically required by laws and regulations, should be "material": *'that is if omitting, misstating or obscuring that information could reasonably be expected to influence the decisions that the primary users make on the basis of these reports'*¹.

It is also very clear, however, that the sphere of interest in corporate reporting is growing and information relevance now has to be assessed based on a fast-expanding list of stakeholders with very diverse interests, perspectives and needs. This is perhaps most evident in the increasing importance of sustainability reporting, and the recent publication of the IFRS Sustainability Disclosure Standards 1 & 2 is testament to this.

Amidst this widening of perspectives regarding what is relevant and significant to readers and stakeholders of corporate reporting, varying definitions and conceptualizations of materiality have emerged:

- 'Financial materiality', as adopted by the IFRS Foundation and the ISSB (International Sustainability Standards Board);
- 'Impact materiality', as adopted by the GRI (Global Reporting Initiative); and
- 'Double materiality', being a twin-track combination of both financial and impact materiality as adopted and required by EFRAG (although, helpfully, the GRI and EFRAG issued a joint statement of interoperability in August 2023, confirming the adoption in the European Sustainability Reporting Standards (ESRSs) of the same definition for impact materiality as the GRI).

Notwithstanding the challenges in addressing this proliferation of different concepts and interpretations, the high-level view remains that materiality is a user-driven concept. This user-driven perspective of materiality was reiterated by the IAASB (the International Auditing and Assurance Standards Board) when they were commenting in October 2023 on the application of materiality to sustainability reporting: *'that is, materiality, is affected by perceptions of the information needs of intended users of the sustainability information, and that judgments about matters that are material to intended users of the sustainability information are based on a consideration of the common information needs of intended users as a group'*².

The readers and users of corporate reporting have different perspectives and information needs, both in terms of the annual report and accounts commonly referred to as 'financial reporting' and the emerging field of separate 'sustainability reporting' – a distinction in terminology discussed at the start of the report so that readers are clear on the definitions and working assumptions adopted for the purposes of this research. Therefore, the key questions that this research seeks to address are: how do companies best identify the relevant material information to be included, and is there one singular conceptualisation of materiality or multiple interpretations that should be applied across the different types of information?

This report from Giovanna Michelon, Stuart Cooper, Xi Chen, Ziyi Guo and Nicolas Garcia Torea, aims to explore to what extent and how the two traditionally distinct reporting arenas of sustainability and financial reporting are becoming connected and overlapping, and shine a light on the processes followed and challenges faced by preparers when adopting either two separate concepts of materiality in each of those areas of reporting or a double materiality perspective.

James Baird
Chair of the Research Panel
April 2024

1 [Conceptual Framework for Financial Reporting](#), IFRS Foundation, 2.11 page A26

2 [Frequently Asked Questions – Proposed ISSA 5000: The Application of Materiality by the Entity and the Assurance Practitioner](#), IAASB

Executive Summary

Study objectives and background

This project focuses on the different conceptualisations of materiality that have emerged in sustainability reporting and their implications for the content of both sustainability and financial reporting and their connectivity³. There are three approaches to materiality currently being adopted by sustainability reporting standards. The Global Reporting Initiative (GRI) adopts an impact materiality approach specifying that organisations should report on their “most significant impacts on the economy, environment, and people, including impacts on their human rights” (GRI, 2021). The International Sustainability Standard Board (ISSB), however, suggests a financial materiality approach, where information is material if it is expected to influence investors’ and capital providers’ decisions as to whether or not to provide or to continue to provide resources to the organisation. The European Commission (EC) and hence the European Financial Reporting Advisory Group (EFRAG) look to operationalise both impact and financial materiality through their double materiality concept embedded in the European Sustainability Reporting Standards (ESRS). The ESRS will be applied by large, listed companies for the reports covering financial years starting on or after 1 January 2024, with the rest of the firms subject to the European mandate gradually adopting them afterwards. The varied conceptualisations reflect the standard setters’ different views as to the purpose and intended users of sustainability disclosures.

Prior research shows that materiality in sustainability reporting from an impact perspective is entity-specific and context-related and that there are varied corporate practices in materiality assessment processes and disclosures. Moreover, there is evidence suggesting that there is information of economic value and of interest to investors and financial stakeholders in sustainability reporting. Whilst there is therefore some evidence that impact and financially material sustainability information overlap, the EC’s double materiality approach will require both to be adopted, potentially widening the scope of corporate financial and sustainability reporting and influencing the disclosure choices of report preparers. Academic research is currently debating whether the two aspects of double materiality are complementary, such that adopting one without the other would lead to the incomplete reporting of sustainability issues). For some, they are conceived to serve the needs of different users. Furthermore, the adoption of this double materiality approach may face challenges related to the inherent complexity of sustainability issues.

Research aims and objectives

This report aims to (1) understand how the two commonly distinct reporting arenas of sustainability and financial reporting are increasingly becoming connected and overlapping and (2) explore the connections between the two by empirically analysing the extent to which material information identified in sustainability reports is also considered material for financial reporting purposes. To achieve these aims, our project attempts to address three research questions:

RQ1. How are materiality assessments for sustainability reporting purposes aligned with financial reporting disclosures?

RQ2. What processes and challenges do preparers face when adopting a double materiality perspective?

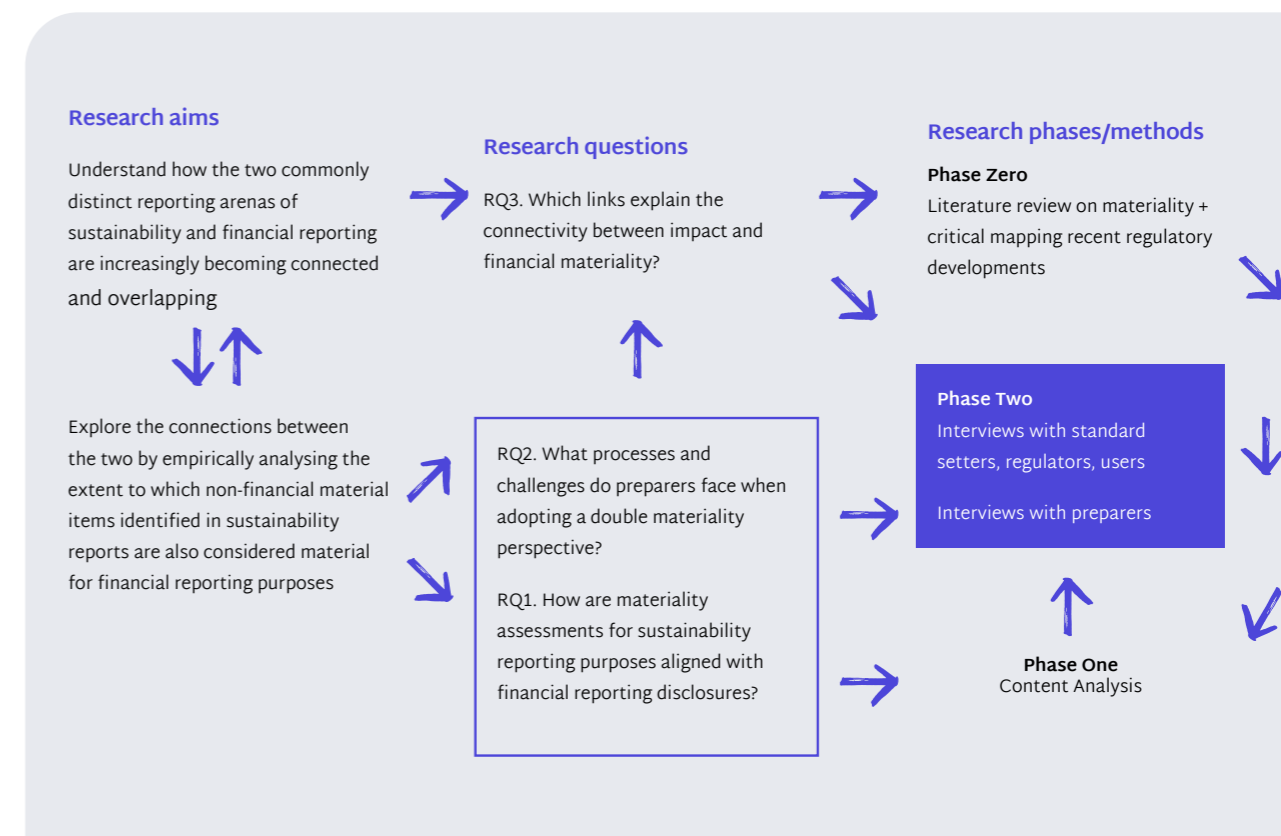
RQ3. Which links explain the connectivity between impact and financial materiality?

³ As a central working assumption for this project, we consider sustainability reporting to relate to disclosures included in stand-alone sustainability reports as traditionally addressing stakeholders’ information needs. For financial reporting, we refer to both narrative disclosures and financial statements traditionally included in annual reports and addressing investors’ information needs.

Summary of research approach

This research adopts a mixed-method approach to assess corporate practices in materiality assessment and bring forward guidance on the issue at hand. To address RQ1, a content analysis was undertaken of corporate financial and sustainability reports published in 2021 by a sample of European listed companies in two broad sectors: namely pollution-prone industries and financial industries. We started by collecting data on the materiality approach adopted (if disclosed) and the material information identified in the sustainability reports. Then, we reclassified individual material topics into a list of themes (which we label “pillars”) and proposed a novel firm-level measure capturing the emphasis given to pillars for our sample firms. Relying on this emphasis measure, we examined the heterogeneity across industry, country and type of materiality approach in the sustainability reports. We then measured the emphasis given to each pillar in financial reporting (separated into the narrative/strategy section and financial statements section) and compared the alignment between sustainability and financial reporting as a proxy for the connectivity between the two reports. Further, to complement these quantitative findings, we conducted semi-structured interviews, which also served as the empirics to investigate RQ2 and RQ3. We interviewed a total of 44 individuals representing three types of relevant actors in the sustainability reporting field: 19 preparers (including preparers of reports covered in the quantitative analysis and assurance providers), nine standard setters and 16 participants from other stakeholder groups (i.e., users, including investors, unions, NGOs, etc.). The interview data was primarily analysed based on specific themes related to the RQs, but the process was iterative, with the coding scheme being revised to reflect inductive insights emerging from the analysis. Further discussions among researchers were undertaken to draw out the main themes and conclusions from the qualitative analysis.

A mapping of research aims, questions, methods and phases is provided below:



Key findings

Concerning how materiality assessments for sustainability reporting purposes are aligned with financial reporting disclosures (RQ1), the analysis (see section 4.1) suggests that:

1. Not all companies are transparent about their materiality assessment processes: 74% of the sustainability reports analysed provide disclosures of the materiality approach used.
2. Companies undertake different approaches to materiality assessments in sustainability reporting: 83% of the 225 companies providing a materiality matrix adopt a double materiality approach, 13% adopt only an impact materiality approach, and the remaining 4% adopt only a financial materiality approach.
3. Although the analysis does not provide overwhelming evidence of misalignment between the sustainability and financial reporting in terms of which sustainability issues are deemed to be most material, we observe some misalignment for corporate governance and environmental issues.
4. Interviews do not reveal systematic approaches to grant or pursue such alignment, in that the underlying reporting processes for sustainability and financial reporting are often siloed and disconnected, suggesting a lack of connectivity between sustainability and financial reporting. Regulation, however, is deemed a factor encouraging greater connectivity between the two reporting processes.

The interviews highlight several challenges companies face when adopting a double materiality perspective (RQ2), which we classify as technical, cultural, and institutional (see section 4.2):

1. Technical challenges mainly relate to determining materiality thresholds, considering time horizons and concern over stakeholders' appropriate knowledge and expertise.
2. Cultural challenges may arise where sustainability issues are not regarded as core to the business. This is further exacerbated when sustainability reporting teams are not integrated with financial reporting units.
3. Institutional challenges reflect the current fragmentation of sustainability reporting standard setting such that companies need to reconcile or at least navigate guidance from multiple sources.

In terms of the links that explain the connectivity between impact and financial materiality (RQ3), the research suggests that (see section 4.3):

1. Different factors undermine the adoption of the traditional conceptualisation of materiality in the sustainability reporting domain, in particular with reference to multiple users' information needs, diverse time horizons and uncertainty about the issues that need to be accounted for.
2. The definition of material topics should start from an impact materiality perspective, and then the list of identified topics should be assessed following a financial materiality perspective.
3. The identification of material impacts is challenged by the lack of active engagement with stakeholders possessing the relevant expertise needed to identify key social and environmental impacts.
4. The notions of risk and corporate governance are useful for connecting impact and financial materiality. Climate change as a financial risk is an example of a sustainability issue enhancing the connectivity between sustainability and financial reporting. Also, companies that implement corporate governance processes, such as setting up board-level committees that directly engage in materiality assessments and discuss sustainability issues, foster an understanding of the strategic implications of material sustainability issues.

Implications

This research has implications for preparers, users, standard setters and policymakers, and for future research. As recognised by both the GRI standards (see GRI 1: Foundation 2021) and EFRAG standards (see ESRS 1 General requirements), embedding double materiality requires preparers to start by evaluating their material impacts before assessing them from a financial perspective. Identifying material topics calls for bi-directional engagement with knowledgeable and representative stakeholders, yet the complex nature of some sustainability issues makes the identification of such stakeholders a challenge. For this reason, companies may draw upon evidence and guidance from sustainability and social sciences. To overcome the siloed approach to the two reporting processes, preparers need to foster cooperation between their sustainability and financial reporting teams. This enables connectivity and ensures that financially material sustainability issues feed into the financial reporting process, as tends to be the case when companies prepare integrated annual reports. Users need to be aware of the potential disconnect between sustainability and financial reporting, which could result in them needing to find sustainability information in different locations. Moreover, users are required to engage with organisations in an informed way and so need to take time to understand the sustainability context.

Standard setters have different perspectives on the purpose and users of sustainability reporting. Their approaches to materiality create a fragmented and complex setting for preparers. Initial steps have been taken to improve cooperation between standard setters, but this needs to go further to ensure compatible prescriptions in the sustainability reporting standards being produced by EFRAG and the ISSB. We recognise that such work is ongoing, as illustrated by the EFRAG-GRI joint statement of interoperability released in August 2023. Standard setters also need to provide further guidance on how materiality is to be understood and how materiality assessment processes can be made more robust, for example, in terms of determining thresholds. For policymakers, the functionality of regulation for emphasising the financial implications of sustainability issues and the connectivity between financial and sustainability reporting requires further development.

Further research is needed in five key areas. First, we find that whilst most firms in our sample adopted a double materiality approach, there remains variation in how different preparers apply this and which users they have in mind. We also find that there are challenges in setting materiality thresholds, including issues related to identifying stakeholders with appropriate knowledge to inform this process. Further research is needed as this practice becomes more established to study how preparers develop their materiality assessment processes of stakeholder engagement and materiality threshold setting. Second, future research could investigate the connectivity of sustainability and financial reporting across firms, industries and regions to analyse the drivers that enhance the connection between material environmental, social and governance issues from a sustainability context and their impact on financial performance. Third, it could explore how firms overcome the siloed approach in sustainability and financial reporting practices and the implications of increased connectivity for sustainability objectives and business models. Fourth, we still know little about the extent to which different stakeholders are able, or not, to use sustainability information to inform their decisions, and how their decision-making impacts corporate practices. Finally, studies are needed to explore the sustainability reporting standard setting process and the extent to which these standards develop to effectively complement each other.

Introduction

Sustainability reporting standards and frameworks have evolved over the last 25 years, with the Global Reporting Initiative (GRI) as the first mover in the field. More recently, however, new actors have entered the field, resulting in significant developments (Cooper & Michelin, 2022). In Europe, the European Commission (EC) appointed the European Financial Reporting Advisory Group (EFRAG) as the technical adviser to develop the European Sustainability Reporting Standards (ESRS) for firms in countries in the European Union. At the same time, the IFRS Foundation⁴ has recently stepped into the sustainability reporting arena by forming the International Sustainability Standards Board (ISSB) to address what it perceives to be a “fragmented” and complex landscape.

These three standard setters, GRI, EFRAG and the ISSB, although attempting to coordinate their efforts⁵, each develop sustainability reporting standards from different perspectives. This difference is most clearly evident in their conflicting conceptualisations of materiality (impact, double and financial, respectively). The various definitions of materiality in sustainability reporting are linked to standard setters’ conceptions of its purpose and perceived users. Sustainability reporting was originally conceived to play an accountability role that encompasses the duty to account for the actions for which an organisation is held responsible in the eyes of all stakeholders (Gray, Owen, Evans, & Zadek, 1997). The different, even conflicting, interests of stakeholders imply a focus on reporting the social and environmental impacts arising from corporate activities – hence suggesting the relevance of impact materiality.

However, the emergence of the planetary crisis and the increasing regulatory and societal attention to climate change and other ecological problems have become a source of physical, reputational and regulatory risk to companies – with potential costs. This situation suggests that social and environmental issues are also relevant for valuation and stewardship purposes, broadening the scope of information that capital providers⁶ demand (Michelon, Sealy, & Trojanowski, 2020).

Moreover, a recent stream of literature (Unerman, Bebbington & O’Dwyer, 2018; O’Dwyer & Unerman, 2020) recognises that companies are exposed to and dependent on the changing ecological status of our planet and this can directly impact corporate operations and, therefore, financial performance (see Technical Readiness Working Group, 2021). Investors and capital providers need information regarding the risks and opportunities associated with these dependencies to assess and price possible financial outcomes (O’Dwyer & Unerman, 2020), suggesting the relevance of a “financial materiality” approach.

The connectivity of social and environmental issues that are material from an impact perspective and a financial perspective remains unclear, as is the extent to which social and environmental impacts and dependencies affect financial reporting practices (although see Baboukardos, Dionysiou, Slack, Tsalavoutas, & Tsiglikas, 2021a and 2021b). Within this context, this study aims to (1) understand how the two traditionally distinct reporting arenas of sustainability and financial reporting are increasingly becoming connected and overlapping and (2) explore the connections between the two by empirically analysing the extent to which non-financially material issues identified in sustainability reports are also considered material for financial reporting purposes.

Given the range of different practices and descriptive terminologies applied within corporate reporting, it is important to clarify what we classify under the terms ‘sustainability reporting’ and ‘financial reporting’ and how, for the purposes of this project, we seek to draw a distinction between these two areas.

In practice, companies produce two different documents: an annual report and accounts (‘ARA’), comprising financial statements and some non-financial information relating to performance, strategy, corporate governance, risks including certain sustainability and remuneration disclosures, the content and structure of which is often prescribed according to local laws and regulations and which is generally seen as being intended principally to address the information needs of investors and financial stakeholders; and a separate and standalone sustainability report which is intended to address the more specific information needs in relation to sustainability matters of wider stakeholders. Some companies seek to provide one integrated document which will feature both the financial and non-financial information included in an ARA, and the more specific sustainability information normally included in a sustainability report⁷. For this project, we assume that ARAs mainly serve the purpose of reporting information about the financial performance and position of the company together with narrative disclosures that allow users of such information to interpret and contextualize the financial performance and corporate prospects. We therefore refer to the information in the ARA as “financial reporting”, while recognizing that it also includes non-financial and certain sustainability information. We draw a distinction between this reporting and when a company prepares a specific and stand-alone sustainability report, which we refer to as “sustainability reporting”.

While we believe it is appropriate to define and distinguish between these for the purposes of this project, we acknowledge that, in practice, investors and financial stakeholders may consult sustainability reports and wider stakeholders may use some or all of the information set out in the ARA. The implications of the inevitable overlaps and inter-connectivity between financial reporting and sustainability reporting, as herein defined, for the understanding and application of different conceptualisations of materiality are considered within this research.

With our investigation, we seek to contribute to the conceptual, policy and practical developments of the double materiality concept, which envisages the connectivity of the financial and impact materiality assessments in corporate reporting (European Commission, 2019; EFRAG, 2021).

To achieve these aims, our project attempts to address three research questions:

RQ1. How are materiality assessments for sustainability reporting purposes aligned with financial reporting disclosures?

RQ2. What processes and challenges do preparers face when adopting a double materiality perspective?

RQ3. Which links explain the connectivity between impact and financial materiality?⁸

The remainder of our report is structured as follows. First, we provide background and relevant literature that further situates our research in both current developments and the academic literature related to the different conceptualisations of materiality and their implications for practice. Section 3 describes our mixed-method research approach, which draws upon both a content analysis of corporate financial and sustainability reports (RQ1) and a set of semi-structured interviews with preparers, standard setters and representatives from other stakeholder groups (RQ2 and RQ3). The findings from our research are presented in Section 4. The findings are structured around the three questions (RQ1 to RQ3). Section 5 concludes with a summary and discussion of its key findings alongside a reflection upon the implications of this research for report preparers, users, standard setters and policymakers, and future research.

⁴ The IFRS Foundation completed the consolidation with the Value Reporting Foundation in August 2022. The Value Reporting Foundation was formed in June 2021 by the merger of the International Integrated Reporting Council (IIRC) and the Sustainability Accounting Standard Board (SASB).

⁵ The GRI and EFRAG signed a Statement of Cooperation in July 2021 and the GRI and the ISSB announced a Memorandum of Understanding in March 2022.

⁶ We acknowledge that some asset owners may also be interested in sustainability information due to their personal preferences which may entail non-financial considerations.

⁷ We note that under the current EU Corporate Sustainability Reporting Directive, companies are required to include sustainability information in the annual report.

⁸ The scope of RQ3 also explores the issue of whether the concept of materiality can be meaningfully adapted from financial reporting or if a new evaluative concept should be considered. This issue is discussed on pages 57 & 58 in the section on the summary of key findings.

Background and relevant literature

The boundary of conventional financial reporting has increasingly become blurred due to a variety of factors, including more social and environmental issues being discussed in corporate annual reports. The dynamics between different meanings of materiality provide an angle to interpret this increasing connectivity between various forms of reporting (Bayne, 2022). Materiality is a fundamental principle in both financial and sustainability reporting that serves as guidance to determine what is significant and relevant enough to be reported, yet it is explained differently across standards and guidelines (see Cooper & Michelon, 2022, for an overview), lacking consistency or being vaguely defined (Edgely, 2014; Unerman & Zappettini, 2014). Despite the plethora of definitions for materiality, materiality assessments are broadly believed to be dependent on the purpose of reporting (Cooper & Michelon, 2022) and the recipients of information (Reimsbach, Schiemann, Hahn, & Schmiedchen, 2020). Notably, a debate has emerged around the materiality principle for sustainability reporting, both in research and practice, making it a contested concept around which it is difficult to reach consensus (Spandel, Oll, Schiemann, & Akkermann, 2023).

There are three approaches to materiality currently being adopted by sustainability reporting standards. Those standard setters that focus on the information needs of broader stakeholders, such as GRI (GRI, 2021) and AccountAbility Framework (AccountAbility, 2018), propose an impact materiality perspective: *“Material topics that represent the organization’s most significant impacts on the economy, environment, and people, including impacts on their human rights”* (GRI GRI3, 2021). The financial materiality perspective is adopted by the Sustainability Accounting Standards Board (SASB, 2020), the International Integrated Reporting Council (IIRC, 2021) and the International Sustainability Standards Board (ISSB)⁹, all of whom appear to assume investors are the principal audience of sustainability information and the principal stakeholder group that informs corporate decision-making: *“information is material if omitting, misstating or obscuring that information could reasonably be expected to influence decisions that primary users of general purpose financial reports make on the basis of those reports”* (ISSB, 2023, p.8). Finally, the EC has instead proposed the concept of double materiality, one that combines both financial and impact materiality. While the idea of double materiality is likely to have its origins in the mandate of the Non-Financial Reporting Directive 2014/95/EU (which stated: *“a company is required to disclose information on environmental, social and employee matters, respect for human rights, and bribery and corruption, to the extent that such information is necessary for an understanding of the company’s **development, performance, position and impact** of its activities”*), it was first formalised and explicitly mentioned in the *Guidelines on Non-financial Reporting Supplement on Reporting Climate-Related Information* (European Commission, 2019, p. 6) and further elaborated by the EC (2021, p.1) and the EFRAG (2021, p. 8): *“Double materiality requires that both impact materiality and financial materiality perspectives be applied in their own right without ignoring their interactions: a) Impact materiality: Identifying sustainability matters that are material in terms of the impacts of the reporting entity’s own operations and its value chain ... b) Financial materiality: Identifying sustainability matters that are financially material for the reporting entity based on evidence that such matters are reasonably likely to affect its value beyond what is already recognised in financial reporting...”*

2.1 Materiality in sustainability reports

Adapting materiality into the domain of sustainability reporting increases the complexity of the materiality determination process, namely materiality assessments, since a quantifiable monetary threshold is less useful or impossible to establish in evaluating the significance of impacts, and a broader range of stakeholders needs to be considered (Edgely, Jones & Atkins, 2015; Giner & Luque-Vilchez, 2022; Puroila & Mäkelä, 2019). In addition to these technical aspects, materiality in sustainability reporting is also a malleable concept. As Bolt and Tregidga (2022) show, materiality in sustainability reporting is a socially constructed concept produced through the “stories” that actors involved in its assessment process tell to make sense of it.

The recent empirical literature on materiality in sustainability reports concentrates on three areas: materiality assessment processes, disclosure of materiality assessments, and the quality of materiality assessments (see Fiandrino, Tonelli & Devalle, 2022 for a review). The first stream of research focuses on the determinants of materiality decisions in sustainability reporting. Based on ten large companies’ G4 sustainability reports in 2012 and 2013, Jones, Comfort and Hillier (2016), suggest that corporate strategies, industry, and geographical locations explain the variations in the ways that companies identify and prioritise material topics. Fasan and Mio (2017) analysed the content of integrated reports of the IIRC pilot programme companies in 2012 and 2013, finding that companies in different industries have different disclosures about materiality assessment, with board size and diversity significantly influencing the extent of disclosure and the breadth of material issues reported. Similarly, Torelli, Balluchi and Furlotti (2020) studied a sample of 210 Italian companies in 2017 and found that disclosure differs across industries, and that the level of stakeholder engagement is strongly related to the comprehensiveness of the implementation of materiality.

The second stream of studies explores the information reported by companies about their materiality assessments. Puroila and Mäkelä (2019) assess the disclosure of the materiality analysis process¹⁰ in the GRI G4 reports of 44 companies in the Global 100 index from 2013 to 2014. Although the materiality analysis of these firms considers different information sources and includes different stakeholders in the process of identifying material aspects, firms promote a company-centred definition of materiality and respond to the information needs of only the most powerful stakeholders, mainly shareholders and investors. Beske, Haustein and Lorson (2020) assessed the disclosure of materiality analysis in GRI and IR reports of 33 German-listed companies from 2014 to 2017. They found that companies disclose a limited amount of information about their materiality analysis and fail to explain the methods used for identifying material topics, although companies extend their reporting on materiality assessment with the adoption of a higher set of GRI standards (G4). More recently, Ruiz-Lozano, De Vicente-Lama, Tirado-Valencia, and Cordobés-Madueño (2022) assessed the disclosure of the materiality determination process in sustainability reports of Spanish state-owned enterprises. The results show that assurance, the use of non-financial reporting guidelines, and the involvement of audit committees contribute to more comprehensive information disclosed about the materiality assessment process, but overall new mandatory reporting requirements do not improve those disclosures. Sepúlveda-Alzate, García-Benau and Gómez-Villegas (2022) studied the positions of material issues in the materiality matrix of sustainability reports of Latin American companies for 2017 and 2018 and reveal that firms in environmentally sensitive industries disclose more information and there are no significant differences in the matters considered as material by companies and stakeholders.

The last stream of research focuses on the informativeness and quality of the materiality assessments. Moroney and Trotman (2016) conducted an experiment where auditors assessed the materiality of audit differences in the same magnitude for both a financial audit and a sustainability (water) assurance engagement. In analysing audit differences, they find overall that qualitative factors have a greater impact on water materiality assessment than on financial statement materiality assessment, when the difference is between 5 and 10 per cent of a relevant base. Drawing on the interpretation of materiality as a social construction, Lai, Melloni and Stacchezzini (2017) carried out a case study in a listed Italian company in 2015 and 2017, exploring who participates in determining the materiality criteria and to whom the IR is addressed. Their findings confirm great subjectivity in implementing the materiality assessment, with little stakeholder engagement except for feedback on the draft IR content by creditors and shareholders. Mio, Fasan and Costantini (2020) studied the same company, suggesting that the inherent difference between the IR and the sustainability report can explain the lack of stakeholder focus. They find that the sustainability report (prepared in accordance with the GRI) identifies different material topics from the IR. Gerwanski, Kordsachia and Velte (2019) show that experience in producing IRs, board gender diversity, and report assurance are positively associated with the quality of materiality assessment. Their findings indicate that firms with a longer history of integrated reporting, more gender-diverse boards, and externally audited reports are more likely to present detailed and comprehensive materiality disclosures. This includes a more refined identification process, thorough descriptions of material aspects, and a clear delineation of the time horizon for material issues.

9 SASB and the IIRC were consolidated under the ISSB in August 2022.

10 We use the terms “materiality assessment” and “materiality analysis” interchangeably throughout this document.

These firms tend to effectively utilise materiality matrices to prioritise issues, and offer in-depth discussions of risks, opportunities, and mitigation actions, reflecting a holistic approach to materiality in their reporting. Recently, Machado, Dias and Fonseca (2021) investigated the quality of materiality assessment in 140 sustainability reports that obtained the GRI Alignment Service Organization Marks in 2017 and 2018. These marks assess how compliant reports are with the GRI's materiality principle. The results show that the reports neither disclose comprehensive and detailed information about their approaches to identifying material topics nor value stakeholder concerns in the process.

To sum up, materiality in sustainability reporting is an entity-specific and highly context-related concept, the interpretation and adoption of which is contingent on factors such as corporate governance, size, industry, geographic locations, reporting experiences and assurance practices. Research on the different practices of materiality assessment under different contexts also shows variations in how companies provide information on how they identify material topics and the quality of those processes.

2.2 Financial materiality of sustainability information

Over the past two decades, there has been increased interest in investigating whether sustainability-related disclosures are value-relevant for investors and recognised by investors as such (Brooks & Oikonomou, 2018). The main hypothesis is that effective sustainability disclosure will reduce information asymmetries between companies and investors by revealing risks of economic losses and opportunities for economic gains. The economic value of sustainability information lies in the fact that it allows the likelihood and impact of certain risks and opportunities that may take time to manifest to be assessed. This information is virtually impossible to obtain through traditional financial statements (Barker, Eccles & Serafeim, 2020; Christensen, Hail & Leuz, 2021). Overall, the evidence supports this hypothesis. For example, Khan, Serafeim and Yoon (2016) directly developed an index from SASB to evaluate the materiality of sustainability issues and construct investment portfolios according to companies' materiality scores between 1992 and 2013. The results show that outstanding companies in some sector-level material sustainability aspects (SASB-defined) are more profitable than those which are not. Grewal, Hauptmann, Serafeim (2021) and Schiehl and Kolahgar (2021) find that firms disclosing more financially material sustainability information (according to SASB) have higher stock price informativeness. More recently, Carvajal and Nadeem (2022) showed a positive association between sustainability disclosures and financial performance, which is more pronounced when the information is financially material (as defined by SASB).

2.3 Connectivity between financial and sustainability reporting from a materiality perspective

Cooper and Michelon (2022) propose that different underlying assumptions about what should be accounted for form the basis on which conceptualisations of materiality are conceived. Specifically, they mobilise two useful economic concepts: externalities and dependencies (O'Dwyer & Unerman, 2020; Unerman, Bebbington & O'Dwyer, 2018). Externalities assume an "inside-out" approach (Giner & Luque-Vichez, 2022), which accounts for the impacts arising from corporate activities that are borne by others (at least in the short term). Dependencies, instead, assume an "outside-in" approach focusing on how sustainability issues affect, or may affect, corporate performance. In other words, dependencies represent the exposure to social or environmental issues that directly impact corporate operations and, therefore, financial performance (Unerman, Bebbington & O'Dwyer, 2018).

Underlying the double materiality concept is the dynamic nature of materiality (WEF, 2020), where the ideas of impacts and dependencies manifest in the process. Businesses have externalities that are not necessarily financial but have social and environmental impacts on a broad range of stakeholders (Cooper & Michelon, 2022). Corporate dependencies are related to a business's exposure to social and environmental risks – arising from mutated social and environmental conditions – that affect corporate financial performance over time (O'Dwyer & Unerman, 2020; Unerman, Bebbington & O'Dwyer, 2018).

Take climate change as an example. Climate-related financial risks caused by business greenhouse gas emissions are now more prominent and have a greater influence on corporate operations because of regulatory changes, social expectations and economic incentives (Tang & Demeritt, 2018). Regulatory, social and economic changes therefore influence how companies address corporate externalities, by making the risks and opportunities brought by issues of social and environmental materiality more apparent (O'Dwyer & Unerman, 2020). For example, the implementation of regulatory policies towards a low-carbon economy imposes new costs for corporations with high emissions (or benefits to companies with low emissions), prompting managers to consider how to manage their emission levels. Along these lines, Freiberg, Rogers and Serafeim (2020) hypothesise that raised societal expectations on corporate practices and the increased power of stakeholders (such as institutional investors) are likely to change regulation and social norms in the industry, which forces firms to internalise the externalities. Further, the financial materiality of sustainability information will increase as companies start internalising their and others' externalities, and hence, sustainability-related financial disclosure will count for a larger proportion of corporate financial reporting (Barker & Eccles, 2018a, b).

The literature seems to suggest that adopting double materiality would allow for more sustainability-related information to be reported and potentially help companies satisfy the information needs of investors and other stakeholders. Some authors even argue that the sole adoption of financial materiality would make corporate reports less relevant, even for investors, since it would not allow them to consider which corporate impacts may eventually become financially material (Adams & Mueller, 2022).

Recent papers further highlight the difficulties in understanding and implementing the idea of double materiality when preparing corporate reports. Jørgensen, Mjøs and Pedersen (2022) surveyed and interviewed financial market professionals. The study indicates that although impact and financially material information in sustainability reports overlap and are difficult to discern from each other, the information provided in these documents still assists the decision-making process of financial market professionals. Research by Garst, Maas and Suijs (2022) shows that the complexity, uncertainty, and evaluative nature of sustainability issues complicate the materiality assessment. Companies' interpretation and understanding of the financial and impact materiality perspectives (labelled by Garst et al. as "business case" and "societal impact" perspectives) play an important role in leading the implementation of assessment, but companies find it difficult to balance the two perspectives. Companies tend to prioritise reporting on financially material topics because of their (financial) relevance in the short term. This is at the expense of collecting information about corporate impacts. This type of information may become financially material over a longer-term time horizon, introduce tensions and increase stakeholders' pressure. Considering the drawbacks of both single financial and double materiality perspectives, Abhayawansa (2022) calls for moving back to an impact materiality approach. He argues that materiality assessment should be driven by the goal of promoting accountability rather than by supporting decision-making, as embedded in the financial and double materiality perspectives. He maintains that this alternative position allows the fulfilment of what should be the purpose of sustainability reporting, such as promoting sustainable development; that is, development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Interestingly, the debate on double materiality as a bridge between sustainability and financial reporting arenas has engendered novel imaginings on how to materialise it in practice. For instance, Barker and Mayer (2021) rely on the notion of externalities as the concept supporting the double materiality approach to reflect on the need by firms to establish reporting processes that foster their internalisation. They propose accounting for externalities by producing a full-cost income statement, where companies integrate their sustainability related-matters by valuing them as the replacement cost that should be incurred to compensate for the deployment of natural capital. They argue that contrasting this form of externality accounting with traditional financial income statements would allow an appreciation of whether companies are creating financial profit at the expense of the environment.

Overall, the notion of double materiality is becoming central to sustainability reporting (Baumüller & Scopp, 2022). Adopting a double materiality approach not only widens the scope of corporate reporting but affects disclosure choices too. The existence of externalities and dependencies highlights the interactions between financial and impact materiality, where the significant impacts of companies' activities will turn into risks and opportunities that influence the development of the company. It is this dynamic nature of double materiality that is causing the financial materiality of sustainability-related disclosure to be increasingly valued, and from which the informativeness of materiality assessments of sustainability reporting for financial reporting can be inferred. However, the two aspects of double materiality are complementary yet contested, hindering the adoption of double materiality in practice. The complexity of sustainability issues, and the difficulty of identifying relevant stakeholders and their interests, which sometimes can also be competing, make the identification of material topics difficult for preparers and the determination of the relevance of information complicated for the users of corporate reports. Also, sustainability information produced under a double materiality approach can be subject to "financial capture" if companies privilege the interests of financial stakeholders over those of others (Abhayawansa, 2022). This malleable definition of materiality leads to the question of how double materiality is adopted by preparers in practice – and highlights the challenges they face.

Research approach

We adopt a mixed-method approach to assess corporate practices in materiality assessment and bring forward guidance on the issue at hand. This approach consists of two steps. First, we conducted a content analysis of corporate annual and sustainability reports, primarily to understand how materiality assessments for sustainability reporting purposes are aligned with financial reporting disclosures, if at all (RQ1). Second, we carried out a set of interviews with stakeholders to further reflect on RQ1, investigate what processes and challenges preparers face when adopting a double materiality perspective (RQ2) and understand what interconnects impact and financial materiality (RQ3).

3.1 Content analysis of reports (RQ1)

To investigate RQ1, we collected the most recently available data for a comprehensive sample of European publicly traded companies in pollution-prone industries (e.g. chemicals, oil and gas, metals and mining, transport and utilities) and the financial sector (e.g. banks, financial services and insurance), reporting under IFRS and with a sustainability report published in 2021. We choose these industries based on the following reasoning. On one side, the literature has identified how industry is a key determinant of sustainability reporting (Cho & Patten 2007; Roberts 1992). Large, listed companies in pollution-prone industries are more likely to have sustainability reports focusing on the environmental impacts of corporate activities (Cho & Patten, 2007). At the same time, they are also highly exposed to environmental dependencies (Bebbington, Schneider, Stevenson, & Fox, 2020). On the other side, the financial sector has been identified as one where corporate dependencies and externalities are also prominent (TCFD, 2017), yet they have less mature sustainability reporting practices (Monasterolo, Battiston, Janetos, & Zheng, 2017). Certain environmental issues, such as climate change, are extremely financially material to financial companies (for example, extreme weather conditions, flooding and wildfires may have significant financial implications for insurance companies). Further, financial companies, such as banks and asset management firms, can contribute to combatting climate change via their investment decisions. This is the rationale for recent policy interventions such as the EU Sustainable Finance Action Plan, which has the objective of leveraging financial markets to support sustainable growth in Europe and the transition to a low-carbon economy. Therefore, the investigation into companies in these two kinds of industries is expected to facilitate our understanding of the connectivity between financial reporting and sustainability reporting. We built our sample from two databases: Eikon and Corporate Register.

Table 1 shows the sample selection process, including the number of firms excluded from the analysis due to lack of data or a sustainability report. We identified 516 firms in the two sectors above with a stand-alone sustainability report or integrated report¹¹. These reports were downloaded either from the Corporate Register database or the companies' official websites. We also searched for the corresponding annual reports in English of this sample and downloaded them from Thomson Reuters Eikon or companies' official websites.

Table 1. Sample selection process.

	Number of firms
European firms downloaded from Refinitiv Eikon	2550
– Firms from minor markets	(174)
– Firms without essential data in Refinitiv Eikon	(259)
– Firms without sustainability/integrated reports in the fiscal year 2020 (from the Corporate Register database)	(1708)
Firms with sustainability/integrated reports in the fiscal year 2020 manually collected from official sources (e.g., corporate website)	107
Firms with available sustainability reports for Phase 1 coding	516
We use Refinitiv Eikon to identify the population of firms subject to non-financial reporting obligations following the NFRD 2014/95/EU and we exclude firms due to lack of financial data or of a sustainability report in 2020.	

Table 2 illustrates the distribution of the sample by industry and country of incorporation. The sample has a relatively balanced distribution between the financial sector and pollution-prone industries¹². The UK accounts for most population in our sample (17%)¹³, followed by Germany (10%) and Italy (10%).

11 To be more specific, since we are interested in materiality assessment of sustainability information, we focus on standalone sustainability reports. However, some companies produce one document in which they include sustainability information and label this as "integrated report". For the textual analyses on the interconnections across sustainability and financial reporting, if a company only produces an integrated report, we choose to compare disclosures in the narrative/strategy section vs the financial statement section. For this reason, our empirical analysis considers the samples of companies producing sustainability reports and integrated reports separately.

12 We define pollution-prone industries as those in "Basic resources", "Chemicals", "Energy", and "Utilities", and the financial sector as those in "Banks", "Financial services" and "Insurance".

13 In untabulated additional analyses, we explore whether our main evidence is different if we consider the UK separately from other European countries. This exercise does not reveal meaningful differences with what is presented in the report for the whole sample.

Table 2. Sample composition.

	Financial sector			Pollution prone industries							Total
	Banks	Insurance	Financial services	Basic resources	Chemicals	Energy	Food, Beverage & Tobacco	Commercial transportation	Travel	Utilities	
Austria	6	1	1	3	1	1	1	4	0	2	20
Belgium	1	0	2	1	4	0	3	2	0	1	14
Bulgaria	0	0	1	1	0	0	0	0	0	0	2
Croatia	1	0	0	0	0	1	3	0	0	0	5
Cyprus	2	0	0	2	0	0	2	2	0	0	8
Denmark	4	3	0	0	0	1	0	5	0	1	14
Finland	3	1	2	4	1	1	2	2	1	1	18
France	3	1	5	3	2	2	4	2	1	5	28
Germany	4	5	6	3	11	0	4	7	1	9	50
Greece	4	0	0	2	0	2	0	2	1	4	15
Hungary	1	0	0	0	0	1	0	0	0	0	2
Iceland	1	0	0	0	0	0	0	0	0	0	1
Ireland	2	2	0	1	2	0	3	0	1	0	11
Italy	11	5	9	2	2	4	3	2	0	12	50
Lithuania	1	0	0	0	0	0	1	0	0	1	3
Luxembourg	0	0	1	4	1	2	2	1	0	0	11
Malta	0	0	1	0	0	0	0	2	0	0	3
Netherlands	3	3	2	0	6	2	4	2	0	1	23
North Macedonia	1	0	0	0	0	0	0	0	0	0	1
Norway	5	2	3	0	3	9	7	4	0	0	33
Poland	8	1	0	1	2	2	0	0	0	3	17
Portugal	0	0	0	3	0	1	0	0	0	1	5
Romania	1	0	0	1	0	3	0	0	0	2	7
Serbia	0	0	0	0	0	1	0	0	0	0	1
Spain	6	2	1	2	1	2	2	2	1	7	26
Sweden	4	0	12	8	0	2	2	1	1	0	30
Switzerland	6	6	5	1	2	1	6	1	0	1	29
UK	10	7	23	15	5	12	3	2	2	10	89
Total	88	39	74	57	43	50	52	43	9	61	516

Following the archival collection, we started collecting information on materiality assessments in the sustainability and integrated reports using manual content analysis (Phase 1). Four research assistants were involved to manually code information about: the non-financial standards adopted (if any at all), the materiality approach adopted (if disclosed), and the list of material items identified. All disclosures (if any) on materiality assessments were collected via NVivo¹⁴. Specifically, we collected: the presence of a materiality matrix (if any), the labels of the axes of the materiality matrix (if any) and the ranking/positions of material items in the materiality matrix (if any) according to their relative distance from the two axes. Operationally, each matrix analysed was split into nine cells, so that each material topic was assigned a score along the two axes depending on its position (see Appendix 1 for process and examples). This process allows us to measure how material the different topics for the firms in the sample are, but also to get a comprehensive understanding of the criteria chosen to identify material items (e.g. the dimensions on the axes of the matrix).

Second, we proceeded to re-classify the list of individual material topics as coded from Phase 1 into a list of themes (which we label “pillars”). This was built considering the classification adopted by sustainability reporting standards such as the GRI or ESRS (see Appendix 2 for the list and examples). Phase 2 coding is important as it allowed us to both standardise the list of material topics (and hence compare across companies) and also to develop useful dictionaries of terms related to each pillar which we then use in Phase 3 to analyse disclosures in sustainability and annual reports.

In Phase 3, we constructed a novel firm-level measure capturing the emphasis given to material pillars for our sample firms and examined the heterogeneity across industry, country and materiality assessment status. We used the textual information about pillars in annual reports and sustainability reports to create the measure. The measure is based on the relative importance, measured as the ranked number of words in the materiality dictionary¹⁵ built in Phase 2, of each pillar in each document. We separated annual reports into the narrative/strategy section and financial statements section to ensure a more precise analysis of the alignment between sustainability topics in the annual vs. sustainability reports.

We first parsed the documents into a vector of words and then excluded certain types of words (e.g. pronouns, conjunctions, stop words, common words and compound words), then we stored the text in separate word vectors. After that, we populated the vector of words in the materiality dictionary with the count of the number of times each word appears in the disclosure documents (separately for the narrative/strategy section, the financial statements and the sustainability report) and used this vector to measure the absolute relevance of each information pillar. Appendix 3 provides detailed information about our information extraction procedure and an example of its process and reliability. We then ranked the raw values into 23 groups (we have in total 23 information pillars) by firm and report type (narrative/strategy section, financial statements section and sustainability report). We name them emphasis scores, where greater values mean that a firm places a greater emphasis upon a certain information pillar within a report.

We measured the emphasis score of each pillar as the number of words related to each pillar. By ranking the emphasis score within each document, we compared the alignment between material pillars across the annual and sustainability reports. Such a measure of alignment across the two reports is a proxy for the connectivity between the two documents. Since we recognise it is a relatively noisy proxy, we complement the evidence from the content analysis with evidence gathered from interviews, as outlined in the next section.

¹⁴ NVivo is a software used to analyse qualitative data (e.g. text).

¹⁵ The dictionary was built by aggregating all disclosed sustainability topics by pillar.

3.2 Semi-structured interviewing (RQ2 and RQ3)

As the quantitative analysis contributes to the understanding of RQ1, semi-structured interviews were conducted to complement RQ1 and address RQ2 and RQ3. Semi-structured interviewing allows us to explore how organisations perform materiality assessments, the challenges stemming from this process for preparers and users, and to reflect on the links explaining the connectivity between sustainability and financial reporting. To do so, we interviewed individuals representing three types of relevant actors in the sustainability reporting field: preparers, users and standard setters.

Regarding preparers, the potential interviewees were identified from the results of the quantitative analysis. We identified and reached out to managers responsible for sustainability and financial reporting of those companies with highly (or the opposite, barely) intertwined sustainability and financial reporting. We interviewed 16 such reporting managers as well as three experts from accounting firms that provide consulting services to sustainability report preparers (interviewees P5, P17 and P18), who may offer complementary perspectives that could enhance the validity of the research. This round of interviews allows us to shed light on the process and challenges faced by preparers when undertaking a materiality assessment (RQ2) but also lay out some qualitative insights that inform the development explaining the connectivity between financial and impact materiality (RQ3).

In terms of users, we interviewed 16 participants representing different information needs, such as investors, NGOs, and unions, to gather views from a wide range of stakeholder groups. Their perspectives enable us to investigate the challenges they face when evaluating the materiality of sustainability information for their decision-making processes and their view on how preparers perform such processes.

Finally, we also carried out interviews with standard setters prescribing sustainability disclosures. Specifically, we interviewed nine individuals engaged in sustainability reporting standard setting, with different approaches to materiality¹⁶.

We designed interview protocols for each interviewee type that cover aspects of materiality and the connectivity of sustainability and financial reporting adapted to their specific perspectives. Appendix 4 contains the three interview protocols.

Table 3 presents the details of the interviewees. Most of the interviews were conducted virtually via Zoom or Teams due to Covid concerns and the interviewees' wide geographical spread. One interview, however, was conducted face-to-face. The interviews lasted, on average, one hour, and were conducted between October 2022 and March 2023. Each interview was audio-recorded and then professionally transcribed for analysis.

Table 3. Interview details.

Panel A. Preparers				
Position	Code	Country	Industry	Duration
Environmental and CSR officer	P1	Spain	Energy & Gas	59 min
Head of Investor Relations	P2	Belgium	Container shipping	54 min
Head Investor Relations and Sustainability	P3	Switzerland	Consumer finance	55 min
Group Sustainability Manager	P4	UK	Waste management	1 h 5 min
Head of ESG	P5	UK	Consultancy	48 min
Head Public Affairs & Sustainability	P6	Switzerland	Insurance	57 min
Head of Sustainability Disclosures	P7	UK	Bank	1 h 0 min
Carbon, Energy & ESG Management staff	P8	Austria	Oil & Gas	57 min
Expert of Investor Relations	P9	Poland	Bank	44 min
ESG Insights Specialist	P10	UK	Water & Utilities Services	1 h 2 min
Sustainability & Net Zero Finance Business Partner	P11	UK	Water & Utilities Services	1 h 2 min
ESG Manager	P12	UK	Energy	1 h 12 min
Senior Director Investor Relations	P13	Germany	Container shipping	1 h 15 min
Head of External Financial and ESG Reporting	P14	Germany	Bank	56 min
Head of Group Reporting	P15	Germany	Bank	56 min
Head of Sustainability and CSR	P16	Spain	Bank	33 min
Risk Assurance and Advisory Services	P17	France	Accounting firm	56 min
Reporting and CSR Risk Manager	P18	France	Accounting firm	56 min
Sustainability Manager	P19	Italy	Pharma	42 min

¹⁶ The interviewees covered the three main standard setting organisations in Europe.

Panel B: User Interviewees				
Interviewees	Code	Country	User type	Duration
Corporate Reporting and Engagement Specialist	U1	Netherlands	Investor association	1h 6min
Interim Managing Investment Director	U2	US	Pension fund	59min
Senior Specialist, Sustainability Reporting	U3	Global	Investor association	1h 4 min
CEO	U4	UK	Investor association	32 min
Head of Research	U5	UK	Impact investment	58 min
Senior Credit Analyst	U6	UK	Asset management	32 min
Senior Portfolio Manager/Analyst	U7	UK	Asset management	48 min
Director	U8	Denmark	Asset management	42 min
Project Manager	U9	UK	Regulator	1h 2min
Project Manager	U10	UK	Regulator	1h 2 min
Head of Unit	U11	Germany	Union	46 min
Head of Stewardship and Sustainable Investing	U12	US	Asset management	1h 1min
General Manager	U13	Spain	NGO	44 min
Head of Unit	U14	Spain	Union	53 min
Executive Director, North America	U15	US	Think tank	55 min
Director of Corporate Reporting	U16	Spain	Regulator	29 min
Risk Assurance and Advisory Services	P17	France	Accounting firm	56 min
Reporting and CSR Risk Manager	P18	France	Accounting firm	56 min
Sustainability Manager	P19	Italy	Pharma	42 min

Panel C: Standard setters*		
Interviewee	Code	Duration
Technical staff	A.S1	1 h 6 min
Board member	A.S2	48 min
Technical staff	A.S3	56 min
Technical staff	B.S4	1 h 9 min
Technical staff	B.S5	57 min
Technical staff	B.S6	44 min
Board member	C.S7	53 min
Board member	C.S8	58 min
Technical staff	C.S9	1 h 23 min

* The standard setter organizations are anonymised for confidentiality purposes. The interviewees covered the three main standard setting organisations in Europe.

The interviews were analysed in three stages: data reduction, data display, and conclusion drawing/ verification (O'Dwyer, 2004; Irvine & Gaffikin, 2006). The interview data was primarily analysed based on specific themes related to the research questions. The coding scheme was firstly created considering the three research questions and then developed to identify the emerging sub-themes. The process was iterative and inductive, with subsequent revision of the coding scheme as the analyses advanced. The interviews were analysed by three researchers who met periodically to ensure consistency.

We subsequently displayed the data by drafting and discussing a first structured description of the findings. Finally, the main conclusions were drawn from the analysis.

After presenting the quantitative and qualitative data collection and analysis procedures, the findings with regard to the three research questions are presented in the following section.

Findings

4.1 How are materiality assessments for sustainability reporting purposes aligned with financial reporting disclosures?

To address our first research question, we start by providing empirical evidence about whether and how companies approach materiality assessment in their sustainability reports (research Phase 1.0). Table 4 Panel A shows that most (380 of the 516) companies with a sustainability (or integrated) report provide specific information about how the materiality assessment was conducted and implemented. Of the 380 companies with materiality disclosures, 225 (59%) also provide a materiality “matrix” (see Appendix 1 for examples) – as a way to assess the materiality of each topic/issue/aspect following a double materiality perspective (Panel B). Perhaps not surprisingly, firms that most commonly use materiality matrixes are from pollution-prone industries, suggesting that they are more likely to have a process in place to assess the materiality of topics for their sustainability reports (Panel C).

Table 4. Reports disclosing materiality assessment

Panel A – Breakdown of reports disclosing any information about the materiality assessment process.			
	Sustainability Reports	Integrated Reports	Total
Without materiality disclosures	128	8	136
With materiality disclosures	275	105	380
Total	403	113	516

Panel B – Breakdown of reports with a materiality matrix. *			
	Sustainability Reports	Integrated Reports	Total
Without materiality matrix	116	39	155
With materiality matrix	159	66	225
Total	275	105	380

*Companies may provide list of material topics even without a matrix, yet they do not indicate how they are ranked or what process/criteria was undertaken to identify them as “material”.

Panel C – Breakdown by industry of companies with materiality matrix.

Industry	N. of companies	Companies in original sample (incidence on original sample)
Banks	32	88 (36.4%)
Insurance	13	39 (33.3%)
Financial Services	24	74 (32.4%)
Basic Resources	22	57 (38.6%)
Chemicals	18	43 (41.9%)
Energy	30	50 (60.0%)
Food, Beverage and Tobacco	32	52 (61.5%)
Commercial Transportation	21	43 (48.8%)
Travel	3	9 (33.3%)
Utilities	30	61 (49.2%)
Total	225	516 (43.6%)

Analysis of materiality matrixes

In the analysis of materiality matrixes, we recorded the dimensions companies used and subsequently classified each dimension into three main perspectives: “company”, “impacts” or “stakeholders”¹⁷. In very few cases, the second dimension was not stated (18 cases). As shown in Table 5, most companies (196) seem to have one dimension that looks at the materiality of the issue for the company – whereas the second dimension looks at the relevance for stakeholders or the significance of the impacts.

In 21 cases, the matrix is built on the significance of the impacts and the relevance to stakeholders. Overall, this descriptive evidence seems to suggest that about half of the companies with materiality disclosures¹⁸ already adopt a double materiality approach in their sustainability report, considering both the relevance for the company/business and for stakeholders.

Table 5. The dimensions of the materiality matrix.

		Second dimension			
		No second dimension	Impacts	Stakeholders	Total
First dimension	Company	10	16	170	196
	Impacts	3	0	20	23
	Stakeholders	5	1	0	6
	Total	18	17	190	225

¹⁷ “Company”: internal relevance, internal view, financial materiality, impact on value creation, priorities in corporate strategy, top management, influence on business, relevance for the company, etc.
 “Impacts”: importance of impacts, external significance, external relevance, sustainability materiality, societal interest, relevance to society, etc.
 “Stakeholders”: importance for stakeholders, influence on stakeholders, priorities assigned by stakeholders, relevance for stakeholders, etc.

¹⁸ 186 companies out of 380 with materiality disclosure consider “company” as their first dimension, and “stakeholder” or “impact” as the second dimension.

Table 6 reports the frequencies of topics grouped up by governance, environmental, and social pillars (Phase 1.1). The most common material topics in sustainability reports relate to employees (overall, in the sample there are 644 employee-related topics mentioned across 221 firms). Other social topics such as diversity, equity and inclusion, community involvement and product responsibility are also deemed material across companies. Among environmental issues, climate change is the most common material item, followed by biodiversity, whereas within governance issues, business sustainability is the most common material item, followed by corporate culture and supply chain responsibility. We note, however, that topics related to boards of directors, accountability and monitoring are also highly material, but apply to a relatively smaller number of companies.

Table 6. Analysis of topics/pillars for companies with a materiality matrix.

	Pillar	n. of topics	n. of companies
Corporate Governance	Board, accountability and monitoring	231	140
	Corporate culture	197	149
	Business impact	208	121
	Business sustainability	380	182
	Public policy	15	15
	Stakeholder engagement	68	57
	Supply chain responsibility	194	149
	Taxation	32	31
	Citizenship	39	32
	ES risks	69	59
Environmental	Biodiversity	163	113
	Climate change	360	188
	Energy	126	90
	Materials	34	31
	Waste	128	104
	Water	115	101
Social	Diversity Equity and Inclusion	195	153
	Community	294	166
	Customer	171	117
	Employees	644	221
	Human rights	126	107
	IT	131	100
	Product responsibility	278	135
	Taxation	32	31
	Citizenship	39	32
	ES risks	69	59

Untabulated evidence suggests differences in which topics are commonly deemed as material across the financial vs. pollution-prone industries. For example, the financial sector is more likely to consider issues in relation to citizenship, environmental and social risks, customers, and IT as material than the pollution-prone industries. On the other hand, pollution-prone industries consider environmental issues as material more often than the financial sector. While this is perhaps somewhat unsurprising, it is worthy of notice that this major difference is attenuated for climate change¹⁹.

We conducted one last test on the material issues covered in sustainability and integrated reports which attempts to explore whether environmental, social and governance issues are “ranked” differently in the materiality matrix, and, in particular, whether the “company” view differs from that of the stakeholders or the relevance of the impact. For most pillar issues this is not the case. However, there are the following notable differences (t-test untabulated): diversity, equity and inclusion (DEI), employees and IT are ranked higher from a company perspective than a stakeholder one, whereas human rights, product responsibility, biodiversity, climate change, waste and water tend to be ranked higher by stakeholders than by companies. It seems to suggest that a company considers micro-level issues that are company-specific as material whereas stakeholders are more interested in macro-level topics.

Materiality alignment between sustainability and financial reporting

We now move to evidence obtained in Phase 1.2 – in which we compare and contrast sustainability topics (and their materiality) across financial vs. sustainability reporting to start exploring the connectivity between the two. For financial reporting, we refer to the annual report holistically so as to include both the narrative/strategy section and the financial statements section. As some companies produce IRs, comparing their IR with an annual report has no meaning since the two are likely to be the same. Therefore, the comparison between material topics was conducted across the narrative/strategy section and the financial statements section within the IR. We present the summary statistics in Table 7 for the sample of firms with sustainability and integrated reports separately.

Overall, we find employees and climate change are the most material topics, followed by product responsibility²⁰. With respect to corporate governance, the most material pillar is about board, accountability and monitoring – and, not surprisingly, it is mentioned more often (258 keywords) in the narrative/strategy section of the annual report than in the sustainability report (198 keywords). Firms tend to disclose climate change and employees as material more often in the sustainability report (435 keywords for climate change and 559 keywords for employees) than in the narrative/strategy section of the annual report (351 keywords for climate change and 478 keywords for employees). Disclosures about the various governance, environmental and social pillars are lower in the financial statements part of the annual report, with the only exception being taxation (six times more often in financial statements than in sustainability reports). For those companies having integrated reports, we only focus on the differences between the narrative/strategy section and financial statements section within the integrated report. We observe similar patterns. Specifically, climate change and employees are the most common material topics and not surprisingly, they are mentioned more often in the narrative/strategy section than in the financial statements section of the integrated report.

¹⁹ As the interview evidence will also emphasise, this finding is related to changes in the regulatory environment that now demands firms in the financial industry to report more about climate change.

²⁰ Examples of ‘Product responsibility’ are responsible marketing and labelling or health and safety aspects of the products.

Table 7. Descriptive statistics on number of material topics related to ESG pillars in sustainability report, annual report and integrated report.

Panel A. Sustainability report and annual report		No. Keywords in Sustainability Report		No. Keywords in Annual Report Narrative/Strategy section		No. Keywords in Annual Report Financial Statement Section	
		Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Corporate governance	Board, accountability and monitoring	198	197	258	246	172	157
	Corporate culture	72	64	45	46	11	21
	Business impact	75	86	54	50	35	42
	Business sustainability	105	116	107	96	38	49
	Public policy	1	3	1	2	0	0
	Stakeholder engagement	57	62	30	33	7	19
	Supply chain responsibility	65	71	41	47	16	18
	Taxation	25	45	47	59	140	97
	Citizenship	213	243	128	119	32	55
	Environmental/Social risks	55	58	91	99	36	58
Environmental	Biodiversity	53	55	31	33	7	18
	Climate change	435	462	351	391	180	263
	Energy	100	128	59	94	25	74
	Materials	20	35	13	26	6	10
	Waste	227	243	211	206	110	135
	Water	90	150	33	86	7	27
Social	Diversity, equity and inclusion	44	46	28	31	3	11
	Community	177	179	166	165	128	130
	Customer	30	59	32	67	8	22
	Employees	559	498	478	394	136	164
	Human rights	51	101	32	42	4	12
	IT	43	62	33	39	11	15
	Product responsibility	294	269	346	290	200	222

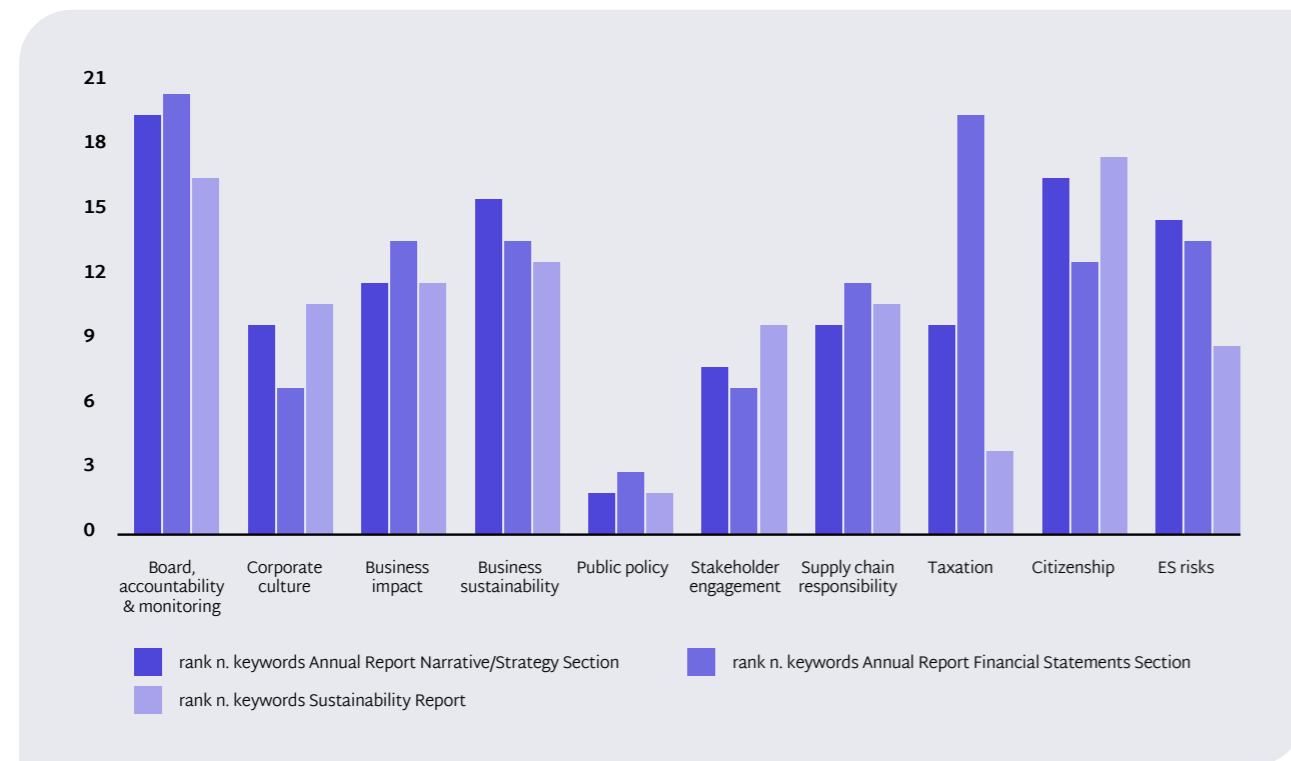
Panel B. Integrated report		No. Keywords in Narrative/Strategy Section		No. Keywords in Financial Statement Section	
		Mean	Std. Dev.	Mean	Std. Dev.
Corporate governance	Board, accountability and monitoring	287	260	177	131
	Corporate culture	66	52	15	21
	Business impact	64	63	39	40
	Business sustainability	131	114	48	48
	Public policy	1	2	0	0
	Stakeholder engagement	50	53	12	16
	Supply chain responsibility	59	71	21	20
	Taxation	35	39	151	105
	Citizenship	183	154	55	77
	Environmental/Social risks	91	98	41	55
Environmental	Biodiversity	49	45	9	21
	Climate change	406	386	225	265
	Energy	83	222	30	103
	Materials	29	54	9	14
	Waste	249	205	122	104
	Water	66	105	13	36
Social	Diversity, equity and inclusion	39	36	7	24
	Community	161	138	126	135
	Customer	36	63	11	23
	Employees	596	462	188	171
	Human rights	45	57	7	13
	IT	40	42	17	28
	Product responsibility	399	278	225	198

In the next set of analyses, to facilitate comparisons, we rank the number of words related to each pillar within each report (or part of the report) for each firm²¹. Figure 1 compares the average rank of various material pillars across annual reports and sustainability reports, whereas Figure 2 shows the average rank of material pillars within the IRs. Overall, the set of graphs visually shows limited misalignment, yet not perfect alignment either. There are more misalignments between the sustainability report and the annual report's narrative/strategy section than between the narrative/strategy section and financial statements of the IRs. There is, in general, less misalignment for social issues than corporate governance and environmental issues.

On corporate governance pillars, the greatest misalignment is noted for corporate culture, stakeholder engagement and citizenship, ranked higher in sustainability reports (narrative/strategy section of IR), whereas taxation and environmental and social risks are ranked higher in the annual report (financial statements section of IR). On environmental pillars, we note the greatest misalignment for biodiversity, energy and water – which are more material in sustainability reports (narrative/strategy section of integrated reports), whereas climate change and waste are almost perfectly aligned. Among social pillars, employees and product responsibility are the most disclosed and also most aligned pillars, whereas diversity, equity and inclusion, customers and human rights are ranked low (less disclosed), but also quite aligned.

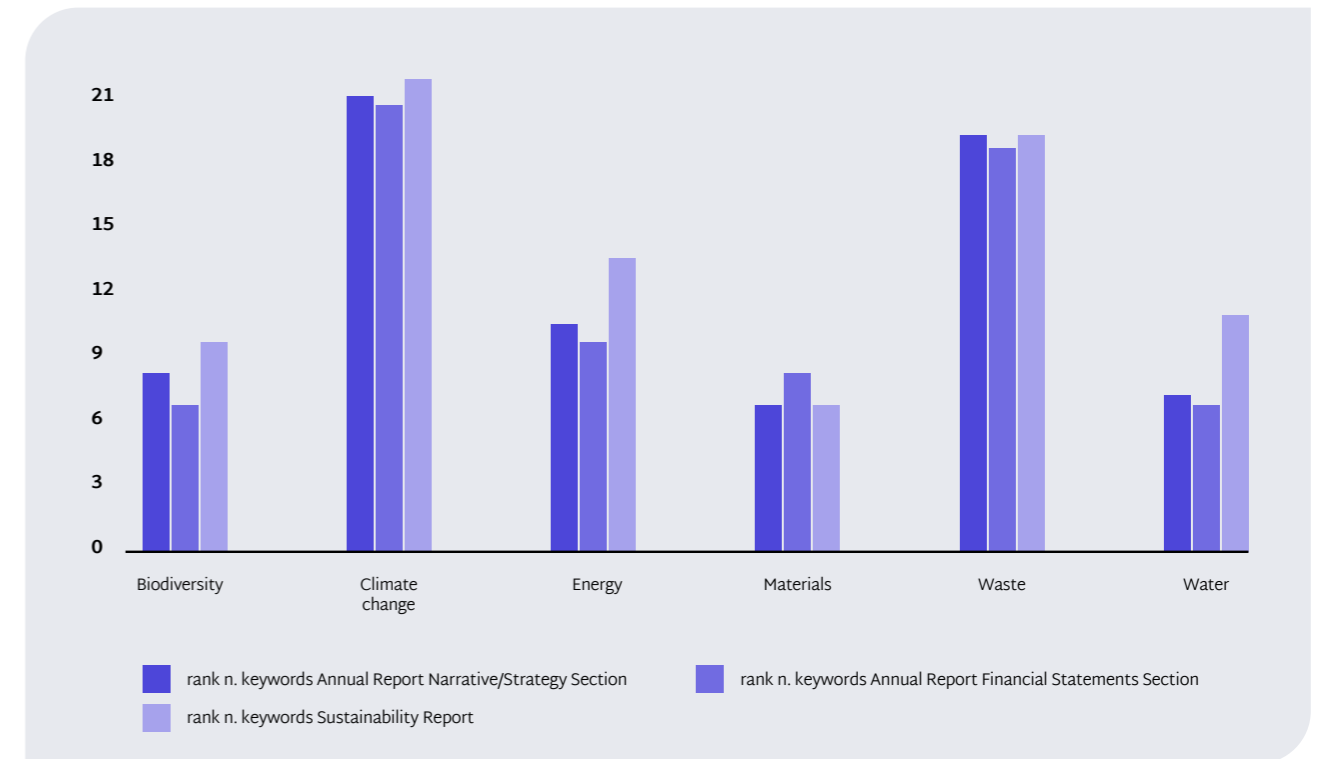
Figure 1. Overview of the alignment of material pillars between Sustainability report and different sections within Annual report

Panel A. Corporate Governance Pillars



21 The rank varies from 1 to 23 since we have 23 pillars in total across all ESG dimensions. To facilitate the reading of the data, we invert the ranking, so that higher values correspond to disclosures with more words, thus capturing relative more emphasis on a certain ESG pillar within a report.

Panel B. Environmental Pillars



Panel C. Social Pillars

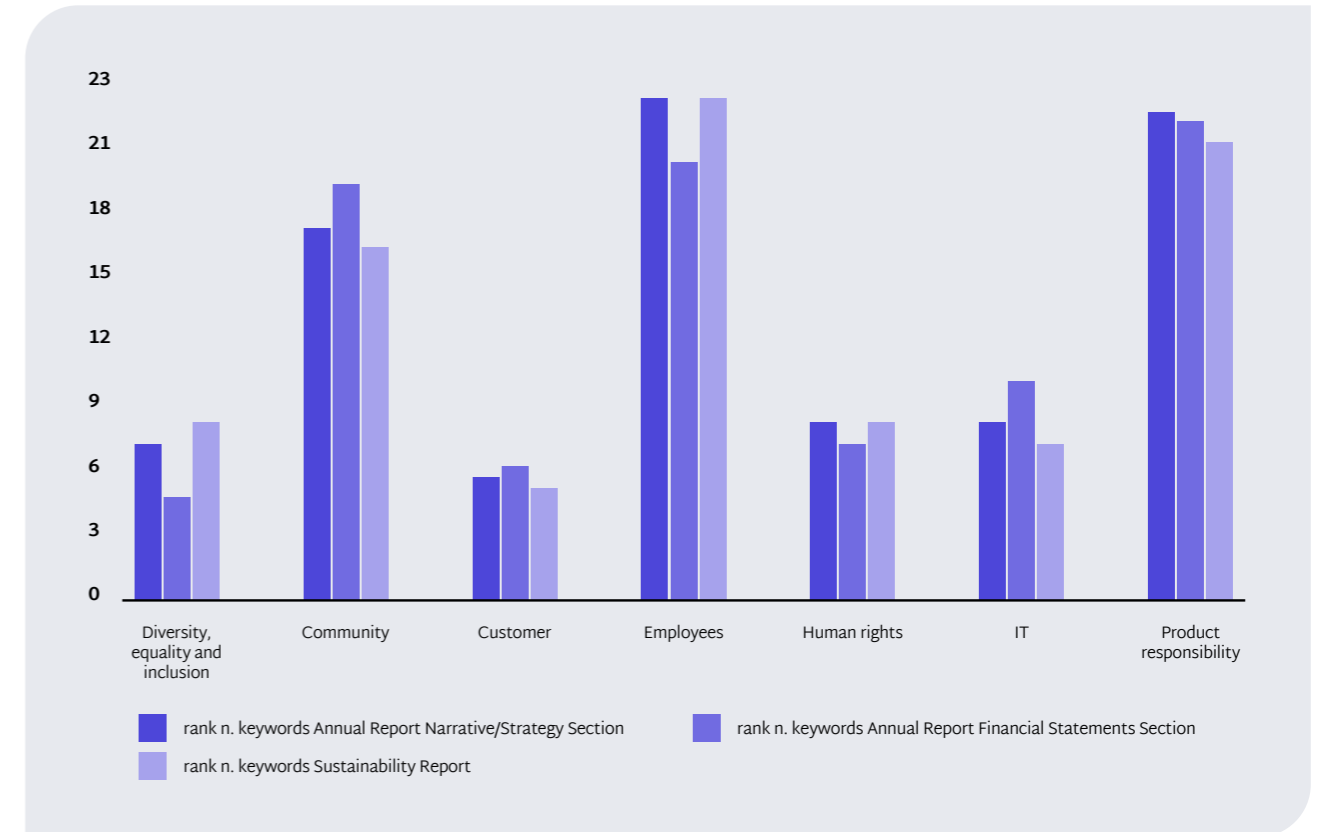
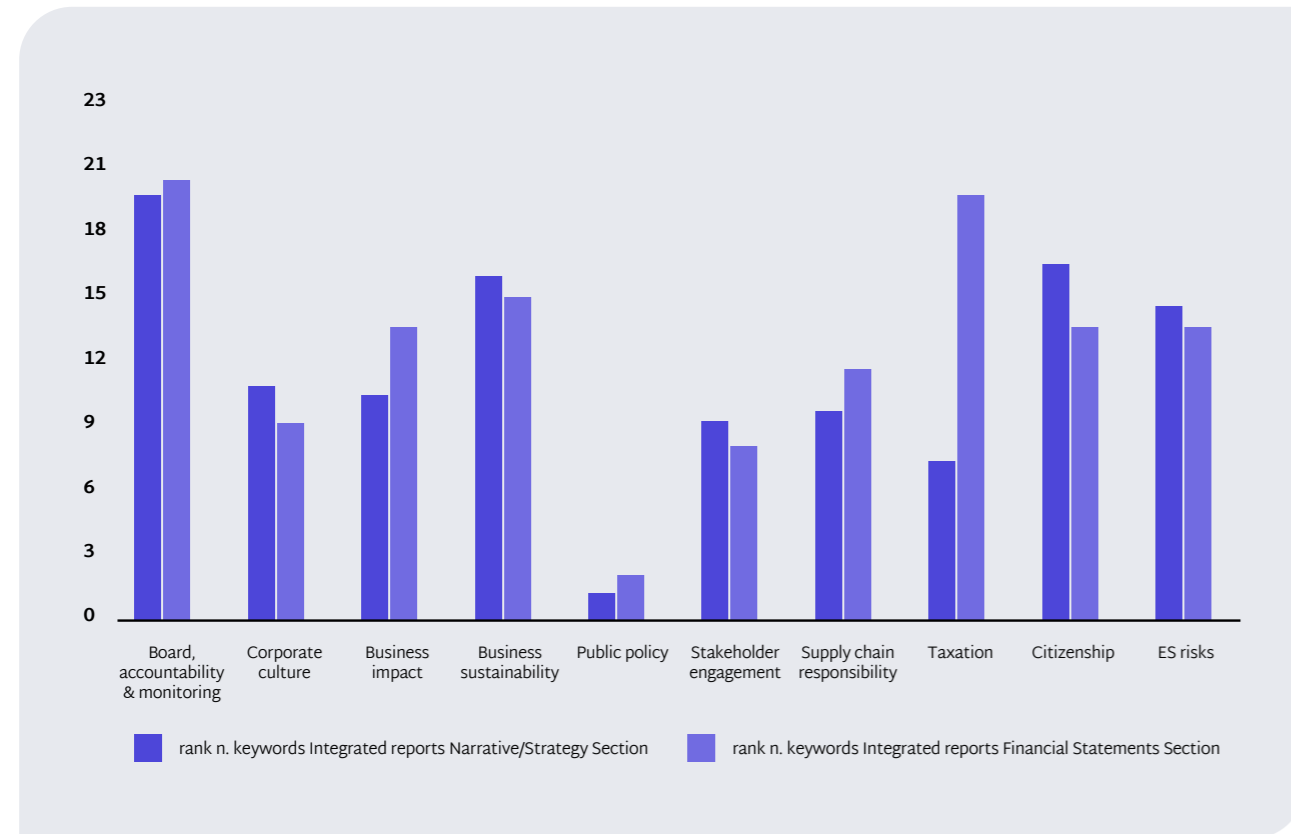
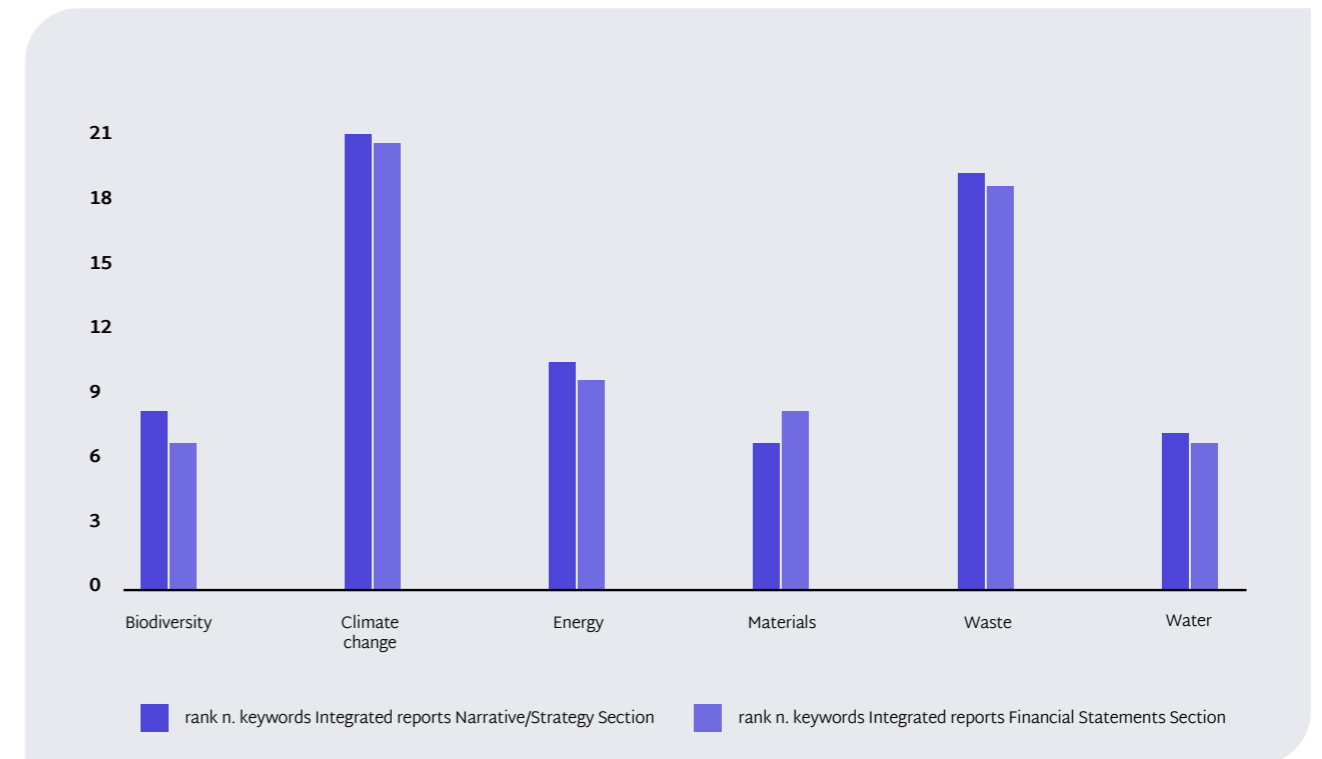


Figure 2. Overview of the alignment of material pillars between narrative and financial statements sections within integrated reports

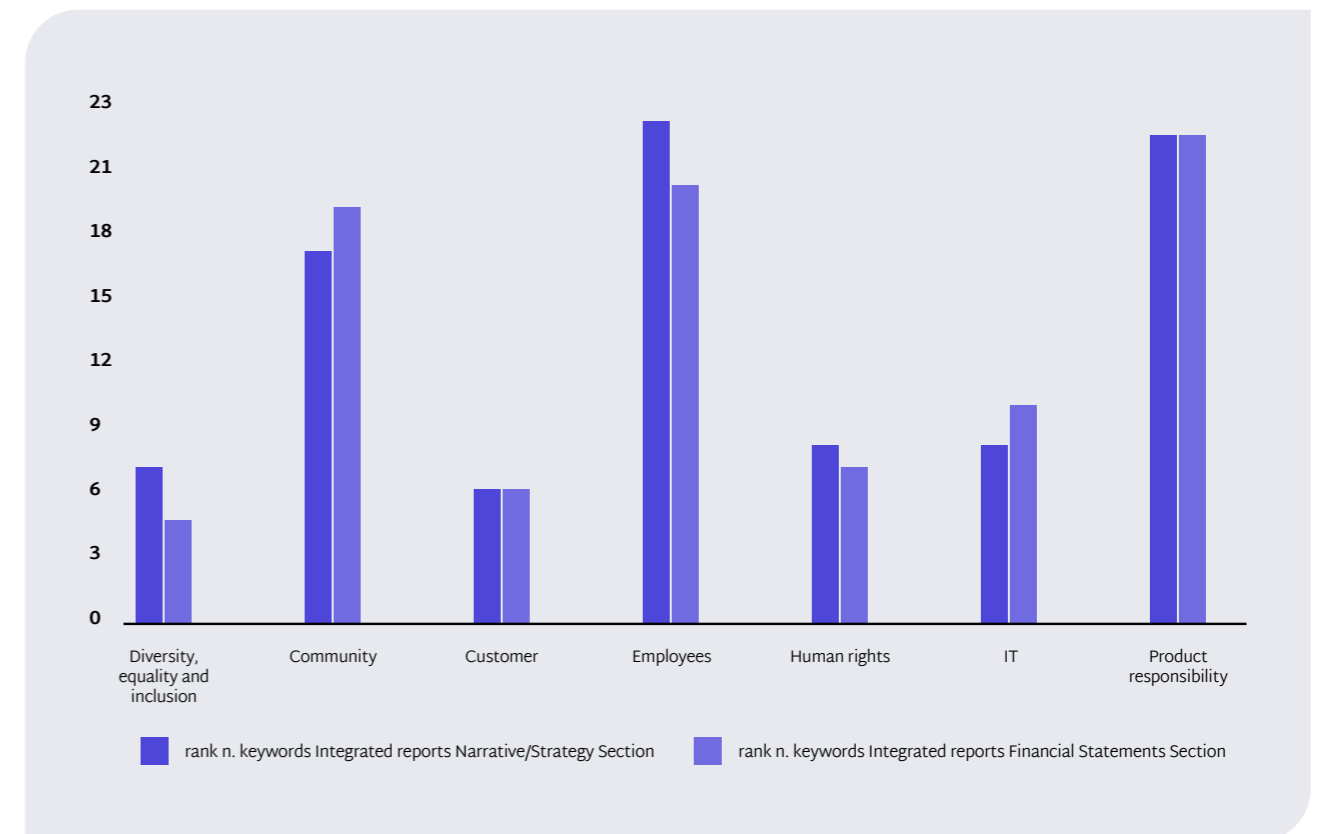
Panel A. Corporate Governance Pillars



Panel B. Environmental Pillars



Panel C. Social Pillars



Such evidence of alignment is also supported by the interviews. Most preparers, users, and standard setters share the view that material topics for sustainability reporting are also relevant for financial reporting, suggesting that both reporting arenas are interconnected and complement each other:

“Numbers are not showing all the truth about your organisation, you have to go deeper, that’s why we want to also show this non-financial part to the market, but together with the financial information because this gives you the full picture.” (P9)

“Yes, I think that they’re inseparable. [...] I’d say they’re absolutely inseparable.” (U12)

However, interviews reveal that even though some preparers note that their financial statements cover sustainability topics, their inclusion is not driven by the sustainability reporting materiality assessment.

“This materiality matrix at the moment is not the driver for really including or not including something in the financial reporting.” (P14)

“I do not see it, unfortunately, because it should be the right thing to do. But the most frequent thing is that neither the sustainability report is substantially fed by the financial report, nor [...] the financial report, from the point of view of its preparers, pays much attention to what is reported in the non-financial information.” (P16)

Despite a regulatory push to include some sustainability topics within financial reporting (mainly environmental ones), financial reporting preparers’ focus on complying with regulatory demands drives them to operate in silos without engaging with their sustainability reporting peers when producing the sustainability-related mandated disclosures in their financial statements or annual accounts.

“I know there are references [in the financial report to sustainability topics] because it is mandated by commercial law and accounting regulations. [...] On the one hand, there are environmental and climate references in the traditional annual accounts and, on the other, in the non-financial [sustainability] statement. It seems like a conceptual error, but there is no coordination [between sustainability and financial reporting teams] here.” (P16)

“I always say we need accountants who are more also interested or have expertise in sustainability areas and we need sustainability managers who understand accountants. I think, until we are fully integrated and the impact is not only an impact for a stakeholder but also on the financial side, [...] it needs to establish this new expertise.” (P6)

Interview evidence suggests this lack of connectivity is due to the different purposes assigned to sustainability vs. financial reporting (“So I think we’ve probably purposely avoided trying to correlate the two.” (P11)), stricter auditing of financial reporting which limits inclusion of other voluntary disclosures (“but we typically would not include too much on a voluntary basis simply because the annual report is audited to a large extent and whatever we report of course needs to be audited” (P14)), but also because sustainability may not be considered core to the business (“You’ve got that disconnect because the sustainability report is the culmination of a structure that’s separate from the core business” (U5)). Furthermore, the fact that sustainability issues tend to materialise in the long term makes their inclusion into the financial reporting process a complex matter (“It’s a significant change in the approach to integrate this long time horizon. Again maybe I have in mind that the starting point is in terms of impact. I think it’s very difficult for a company to integrate this long time horizon for risk”. (P17)). The misalignment of time horizons is something users are aware of (“I often think the shorter a time horizon, the less material ESG issues are and the more material the narrow financial information issues are. The further you extend your time horizon, those things swap. The more important ESG issues are, the less important the financial issues are.” (U5)).

Interviewees highlighted how the disconnection between the processes underlying sustainability and financial reporting could lead to discrepancies between the information disclosed in each document:

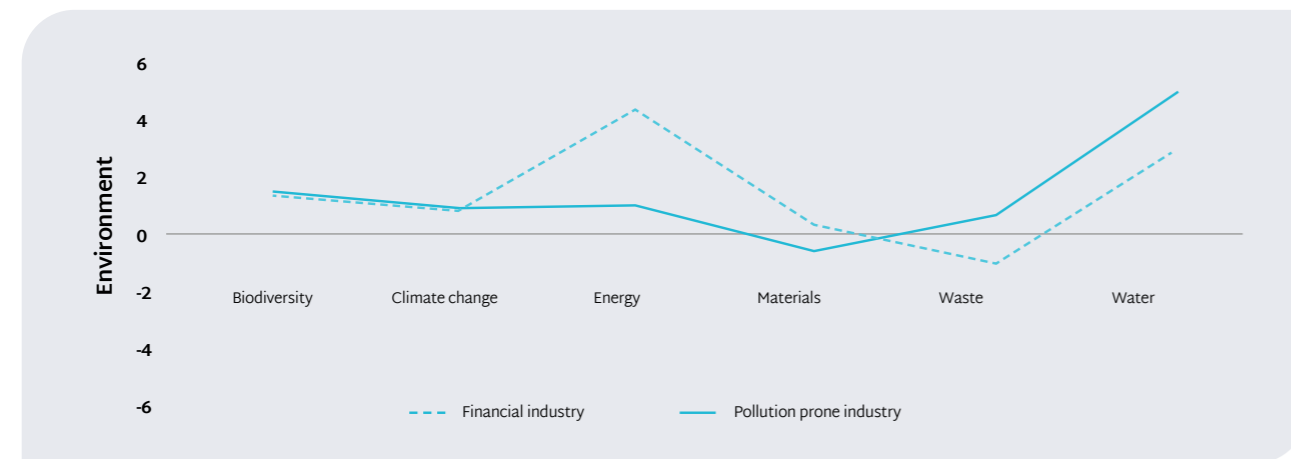
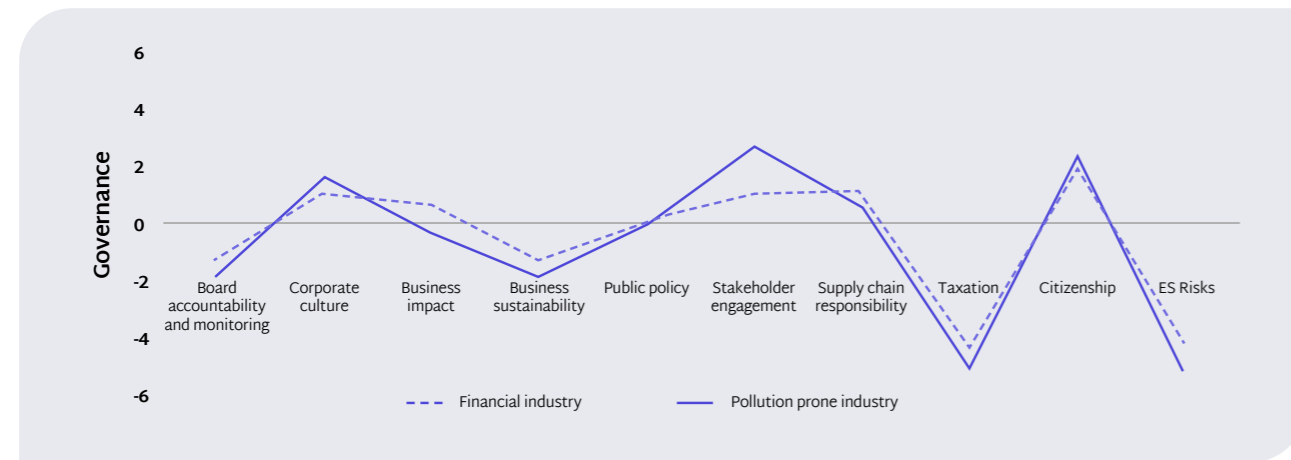
“When you compare the financial and non-financial information, you realise there is still a significant gap between the person who prepares one piece of information and another within the company. Many times when you go to that information, more in the financial field, you realise that there is even contradictory information.” (U13)

“There’s a case at COMPANY X where – they’ve now tried to address this in the financial statements actually, but in one year, we saw, for example, the company was saying in other literature that they were going to reduce production of oil and gas by 40 per cent from the current year baseline by 2030. At the same time, we saw that in the financial statements when they were testing goodwill for impairment for a set of upstream producing assets, they were assuming a flat production past 2030.” (U15)

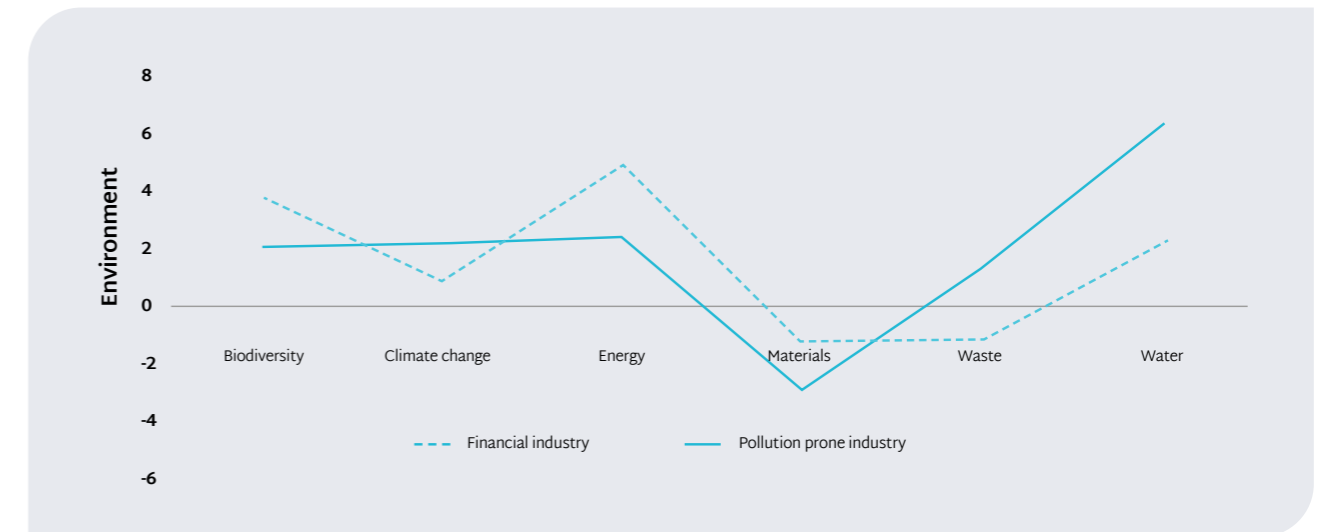
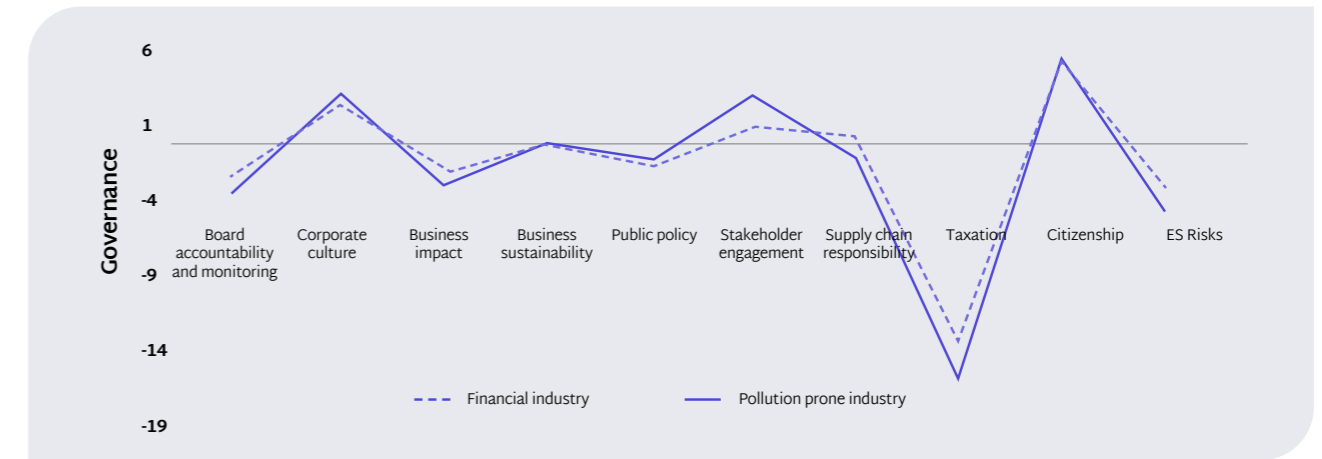
In Figure 3, we plot our (mis)alignment measures by pillar, separately for pollution-prone vs. the financial industries. The (mis)alignment measures for companies with separate sustainability reports are calculated as the difference between the rank that the pillar has in the sustainability reports and the rank in the narrative section of the annual report or the rank in the financial statement section. Figure 3 reports the patterns of the (mis)alignment for companies with integrated reports. The closer the lines are to zero, the more the reports are aligned. In general, the financial sector and the pollution-prone industries follow a more consistent pattern of alignment within integrated reports than between sustainability reports and annual reports. In the latter type of comparison, the pollution-prone industries and the financial sector have a more consistent pattern of alignment in corporate governance issues, but a less similar pattern in environmental and social issues. It seems that, for environmental issues, companies in pollution-prone industries have their sustainability reports more aligned to the narrative section of the annual report than companies in the financial sector (except for water). We also note that among environmental issues, the alignment of energy and waste pillars displays the biggest differences between the financial sector and pollution-prone industries, where the financial sector shows much more misalignment than the pollution-prone industries. However, the opposite is true when we compare the sustainability report with the financial statement section of the annual report (or within integrated reports). This is quite surprising given that firms in pollution-prone industries are arguably more exposed to environmental dependencies, which could have a financial relevance for the business. This analysis complements previous studies reporting that industry affects materiality assessments (Fasan & Mio, 2017; Jones, Comfort, & Hillier, 2016; Torelli, Balluchi & Furlotti, 2020), by showing that industry is also related to the alignment of specific sustainability topics between sustainability and annual reports, and within integrated reports.

Figure 3. Alignment by pillar and industry

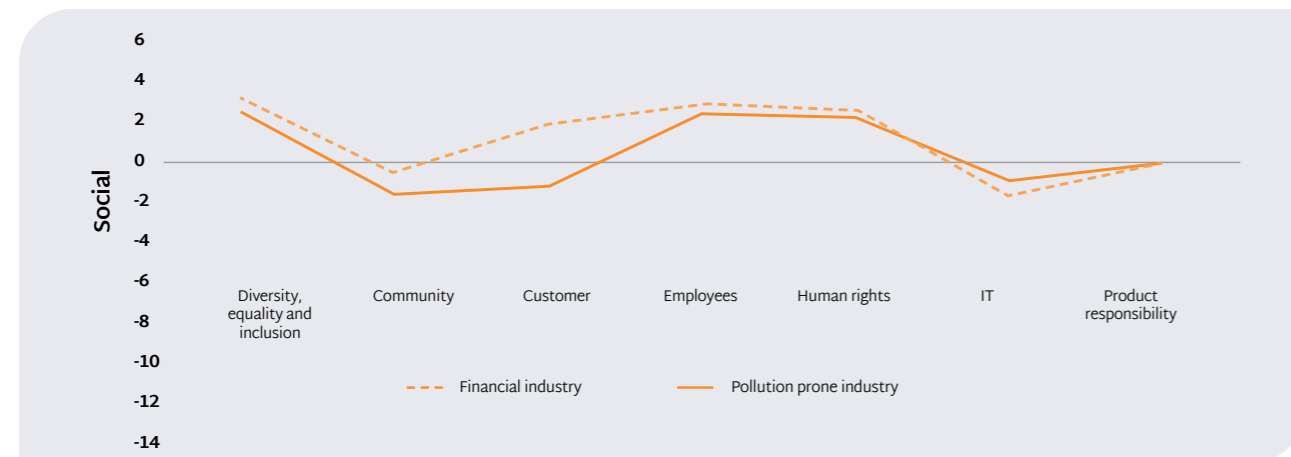
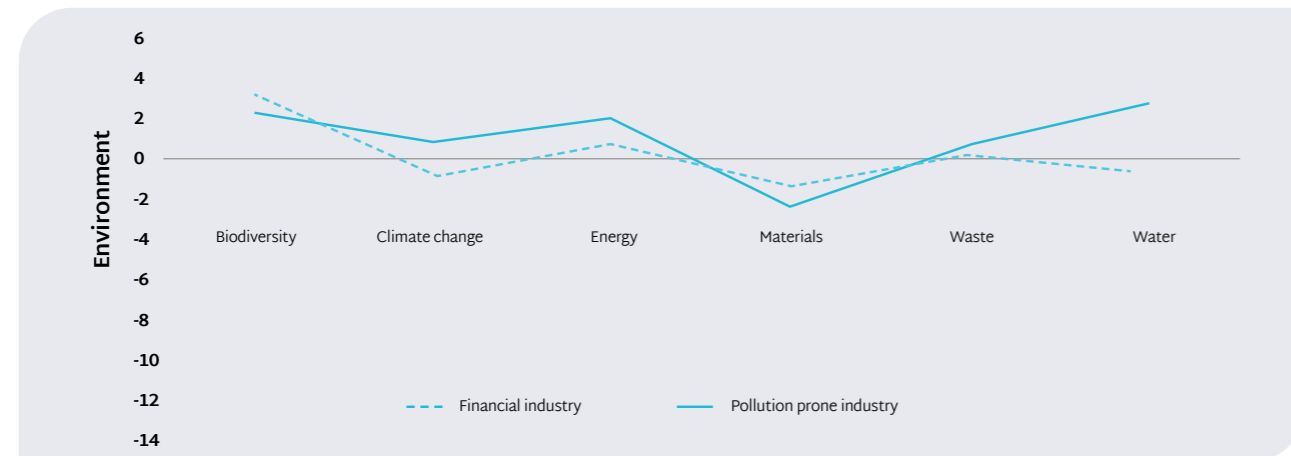
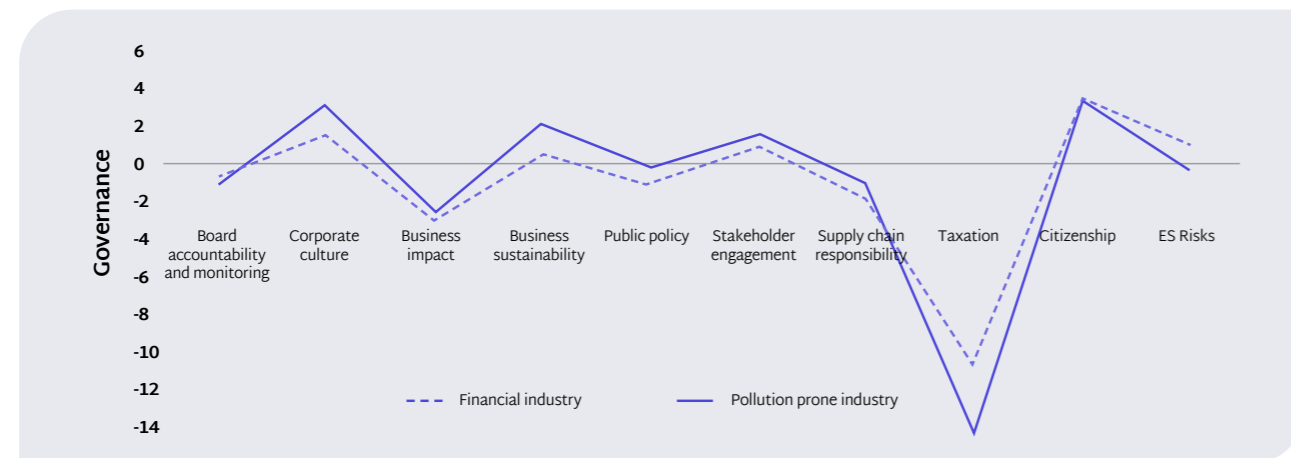
Panel A. Sustainability Reports vs Annual Report Narrative/Strategy Section



Panel B. Sustainability Reports vs Annual Report Financial Statements Section



Panel C. Integrated Reports Narrative/Strategy Section vs Financial Statements Section



In any case, among firms in pollution-prone industries, there are also some pioneers that are attempting to overcome siloed approaches to sustainability and financial reporting, by fostering cooperation between the two organisational units responsible for corporate reporting:

“We do [the sustainability and financial reporting process] in parallel. Now we do it at the same time. Our [sustainability reporting] team with the accounting team and the financial team are in permanent contact and coordination. They provide us with information that we need for the sustainability report and vice versa; they also ask us what impacts we are having or what aspects we have to include in the accounts. We are absolutely coordinated between the two worlds.” (P1)

“That part [climate information in financial statements] is really driven by our finance side. They [...] have set up the analysis and certainly consulted us about what [are] the different scenarios that they should use and [...] what they really mean [...].” (P8)

Additional analyses

We performed some further analyses which did not lead to significant insights, and therefore are not tabulated for the sake of brevity. First, we investigated whether the alignment of environmental material pillars between sustainability and annual financial reporting (or within integrated reports) differs across countries with different environmental protection regulation²². We fail to find significant differences, although climate change and biodiversity seem to be more aligned on average in countries with high environmental protection than in countries with low environmental protection. We ran a similar comparison for social material pillars considering countries’ global freedom score²³ but again, there are no salient differences between the alignment for reports in high-freedom vs. low-freedom countries. Finally, we consider whether firms that disclose information about how they conduct their materiality assessment for sustainability topics present a better alignment between sustainability and financial reporting. The idea is that if firms follow a specific process for identifying material items in their sustainability reports, this would facilitate the integration of this information in the financial reporting process, resulting in its integration in the narrative information contained in the financial statements or as part of the annual report. Once again, there are no common patterns and it is not clear that firms who report information about how they run the materiality assessment for sustainability reporting have more alignment with financial reporting. This result is surprising considering Puroila and Mäkelä (2019), who found that companies that report on their assessment process tend to have an investor-focused perspective, something that should have led to a greater alignment with financial reporting.

The reason why such a perspective does not translate into the financial reporting domain may be due to a shorter-term perspective, stricter auditing requirements and a focus on regulatory compliance within financial reporting as well as the sustainability and financial reporting processes tending to be separate and siloed, as suggested by the interview evidence presented above.

²² We use the 2022 Yale Environmental Performance Index (EPI) which provides a data-driven summary of the state of sustainability across countries. The EPI ranks 180 countries according to how close countries are to established environmental policy targets. Data available at <https://epi.yale.edu/>
²³ <https://freedomhouse.org/countries/freedom-world/scores>

4.2 What processes and challenges do preparers face when adopting a double materiality perspective?

Most preparers highlight stakeholder engagement as the key tool to identify material topics. This process is usually implemented through unidirectional (e.g. surveys, big data analysis, web scraping) or bidirectional (e.g. meetings, interviews) channels with their relevant stakeholders, both internal and external.

“[W]e did it together with an external consultancy, [it] was a very good experience [...]; we identified the stakeholder backers then we identified potential representatives of those stakeholders. Then, we did structured interviews which were partly quantitative on the assessment and qualitative with questions, and we concluded from those interviews the relevance of the topics and also the main elements of the topics. It was also done, of course, according to GRI with the external stakeholders and internal stakeholders and then we consolidated that.” (P3)

Some organisations have started to offer services providing firms with data for their materiality assessments. This data works as a benchmark to corroborate their internal processes:

“We are aware of certain providers out there that give [firms] a tool that allows [them] to monitor across [their] peers and within [their] industry what are the material topics and analysing analyst reports and news articles etc. to help [firms] determine what’s material.” (U10)

Stakeholder engagement has usually been applied in sustainability reporting to perform impact materiality assessments from an inside-out perspective. To apply a double materiality perspective, preparers have adapted their engagement processes with some stakeholders, such as top management teams and investors, to identify financially material impacts.

“[...] the last time we also tried to have financial materiality as a third dimension to our analysis. We had all of our senior executives, not just our board, but something like fifty people below that senior management level rate every single aspect in our materiality analysis based on the financial importance to the company, and then why it was important. Something like credit risk, reputational risk, things like this. Really trying to assess the financial importance of the topics and then use that for our metrics.” (P8)

The adoption of a double materiality approach creates tensions (Jørgensen, Mjøs, & Pedersen, 2022), which sometimes calls for reconciling the impact and financial materiality perspectives to define what ends up being reported:

“There are certain topics where our sustainability view would tell us this is a very important topic to focus on, but then our analysis says well it turns out it’s not so important, [...]. Reconciling this aspect of what, at times, externals find important but also what our internal view would tell us is key.” (P8)

This connects with one of the most significant challenges preparers face when performing materiality assessments: determining the threshold to define the topics to be reported. As suggested by prior literature (Edgley, Jones & Atkins, 2015; Giner & Luque-Vilchez, 2022; Puroila & Mäkelä, 2019), establishing thresholds becomes more problematic in the field of sustainability reporting due to the difficulty of quantifying sustainability impacts:

“But again a threshold for something which is financial is quite easy; you are saying that it’s one hundred and you know how to define it. But again for [sustainability impacts], it’s very difficult to define a threshold to say beyond that it’s not material.” (P18)

This problem generates a diversity of practices regarding how firms determine thresholds in their materiality assessments. While some companies perceive this process as a sort of negotiation to balance different perspectives, others define a quantitative threshold based on the scores obtained from stakeholder engagement.

“That’s why we had the discussions with the exec. We talk [...] and agreed where we felt that that pink line should be. The consultants too, they put it in, but we agreed that there could be a little bit of flexibility[...]. Should we include a few more? Should a few more fall out of it because you can’t have too much in there? [...]” (P4)

“Everything in the final survey that was over three was ranked as being material, so kind of the halfway point, and then we set all of our eight larger topics that we identified [...]. We’ve now added a bit to this through internal consultations and our strategy developments and have twelve topics.” (P8)

As a consequence of this variety of practices, the process of determining a threshold is not considered to be robust enough by one standard setter interviewee:

“They can make judgements of course but they don’t have recourse to a definitive authority on, given these impacts, where should we cut off our reporting, where should we draw the line as far as our primary weakness areas in sustainability and the way that we operate our business. [...] There’s a lot of just making do kind of decisions on the fly that are probably not as good as they could be, but [...] we don’t have anything else that we can use to tell us what we should report or what we shouldn’t report.” (A.S2)

To address this problem, reporting standards should provide more guidance on how to establish thresholds:

“In terms of setting thresholds, yes, I think that could potentially be one of the areas where [Standard Setter] provides more guidance going forward.” (A.S3)

Another challenge that emerged from the interviews is the difficulty in guaranteeing adequate representativeness in stakeholder engagements to ensure that relevant and knowledgeable constituencies are taken into account:

“[W]ithin the environmental topic, biodiversity and ecosystems really ranked as very, very unimportant to our stakeholders. [This is] partly because many of our stakeholders probably don’t know biodiversity impacts [and] we obviously can’t go around interviewing animals and trees [...]. So, obviously stakeholder views are somewhat limited in many of these topics.” (P8)

“[F]irms simply ask stakeholders, [who] themselves know nothing about sustainability, and they end up ranking things. And biodiversity always gets dropped because no one understands it.” (B.S6)

“[T]hese identification processes do not really respond to what should be a process of identification and integration of stakeholders that is balanced, bidirectional [...]. The stakeholders’ engagement should be a participation with [...] entities directly affected or entities that have in-depth knowledge of the issues that are discussed.” (U13)

Interestingly, the last quote also points to the fact that stakeholder engagement processes are sometimes perceived as passive, as they do not enable a bidirectional dialogue between consulted constituencies and firms. This limited form of engagement shows that materiality assessments tend to have a narrow focus, restricting significant interactions to the most powerful stakeholders, such as investors (Puroila & Mäkelä, 2019).

However, even if there is an adequate representation of knowledgeable stakeholders, further issues may arise regarding the importance that should be attached to each of them when analysing and weighting their responses. This aspect is important to guarantee that all relevant topics are considered even though few representatives of a stakeholder type have been consulted.

“[W]e have to go through those [seven stakeholder groups] to ensure that actually you haven’t just got what’s important to one group of people putting that material topic to the top of the pile [...] It does reflect that those five issues are reflective across the organisation. It’s not just all water, for example, or it’s not just all social, it is a mix. It’s a great challenge and it’s difficult.” (P10)

To solve some materiality assessment shortcomings, firms are being called to consider science as part of their process of identifying material issues. However, most of them are not yet doing so:

“I strongly believe that materiality needs to be science based. [...] I do think that when we look at scientific papers on sectors and their impacts, that should be the start of the game.” (B.S4)

“I think we might have already done that, to bring people with a stronger sustainability science background.” (C.S9)

B.S4 also discussed how knowledge from social sciences can particularly inform the materiality of social sustainability issues and so a science-based approach can relate to both social and environmental sustainability concerns. Nonetheless the most prominent way in which firms are being demanded to consider this is through the endorsement of the Science-Based Target Initiative. This initiative focuses on one specific environmental issue, climate change, and seeks to support firms in setting net-zero targets in accordance with climate science.

“One question we get is regarding science-based targets ... are you also reporting in line with the Science-Based Targets, which we’re not doing at the moment.” (P13)

To evaluate the consistency of materiality assessments, users require firms to provide information on how they were carried out and the resulting identification of material issues:

“[O]ur position around the materiality assessment is more from the perspective that it needs to be reported. The methodology and that process should be reported [...]. [T]here are probably some core elements in terms of what the result of that materiality process should be, as well as the steps that they’ve taken to get to that.” (U3)

By contrast, another user (U2) is more sceptical as to whether materiality assessments are useful. This interviewee was concerned that companies “used a heightened threshold of materiality to almost not have to ... provide any information”. This user suggests that “materiality is in the eye of the investor” and that investors will use their own materiality determination, engaging with companies when they do not receive the information they require.

“So the answer to your question is [that] we use our own materiality determination to determine whether or not the company is properly reporting. To the extent that they don’t give us the information we want, we ask for more.” (U2)

The EU regulation is perceived to be a driver for the connectivity between sustainability and financial reporting by requiring the adoption of a double materiality approach. However, some preparers, users and standard setters argue that more clarity is needed as to how to comply with such requirements, notably from the ESRS, which will be mandatory for companies under the scope of the Corporate Sustainability Reporting Directive:

“It’s true that EFRAG works on double materiality, but it is still not very clear how we are going to have to apply it in detail.” (P1)

“It’s slightly different for the European standards, which [...] have a little bit more of a process in place, but even [there] the guidance for the [...] materiality assessment is also still pretty high level.” (U3)

Despite the enactment of the ESRS, companies will still face the challenge of having to report according to several standards with different approaches to materiality:

“Unfortunately, we are going to have to live with several different standards.” (P1)

“[Applying several reporting standards has] been frankly a massive headache. [...] A company of our size has to sign up to all these different standards and report according to them all simultaneously and extremely comprehensively, [which] has been a very big challenge.” (P12)

According to interviewee A.S1 (also A.S3), applying a double materiality perspective will call for the use of two standards – GRI for impact materiality and the ISSB for financial materiality – hence overlooking the role of the ESRS.

“I’m tending to say to people that if they want double materiality, do GRI and ISSB, and think of them holistically, and they’ve probably got the double materiality.” (A.S1)

This multiple standard scenario presents further challenges for firms, especially for multinational companies that may be required to apply different reporting frameworks:

“I wish for this reporting to be harmonised because with the different initiatives we see in Europe, in US, in Asia and everyone is talking about the same thing but not looking at the same measure, methodology. [...] I hope, at some point, we will have a common base and shared views of sustainability reporting. Because for [an] international company, [...] doing one [...] would be difficult, but doing 12.” (P18)

Cooperation between standard setters is needed to guarantee the compatibility of standards (Giner & Luque-Vílchez, 2022). Specifically, preparers and users value the cooperation between EFRAG and the ISSB to guarantee that compliance with the ESRS regarding financially material climate issues will directly ensure compliance with the ISSB standards:

“...[A]s I understood the European regulators are working with [the] IFRS body to make those two standards comparable and work in connection. So, I am keeping my fingers crossed that they will succeed.” (P9)

“We really welcome the [...] [announcement [...] that there’ll be even stronger alignment between the ISSB and the ESRS.” (U3)

Overall, evidence from the interviews suggests that firms need to adjust their stakeholder engagement processes to apply a double materiality approach. This is to say further engagement with top management teams and investors to assess sustainability issues from a financial materiality perspective may be needed, whilst recognising the potential tension between the outcomes of this and the impact materiality assessment process. Additionally, the interviewees also point to a number of challenges that organisations face when determining what sustainability topics should be covered in their reports; notably, the difficulty of evaluating thresholds and the importance of guaranteeing a suitable representation of knowledgeable stakeholders. Although the forthcoming regulation and standards are expected to help preparers in operationalising their materiality assessments, they may also bring obstacles due to their divergent approaches to materiality.

4.3 Which links explain the connectivity between impact and financial materiality?

Most preparers, standard setters and users consider that the outside-in and inside-out relationships are the key links driving the connections between impact and financial material sustainability topics. Their general view is that topics that start being material from an impact perspective may eventually become financially material:

“I believe that it’s impossible to have a material impact that doesn’t have [a] material [financial] risk on business. I’m sure of that. If the activities of a company have a material impact on each stakeholder, at some point, it will bring in risk for financial [...]. I’m pretty sure of that. [...] The link is natural.” (P18)

“But ideally, in my understanding, all these impact aspects that are captured by the sustainability statements, unless they are pure externalities, they will go back to the companies at some point in time. So, they should be financially material later.” (B.S5)

“[C]ompanies exist within an interrelated system of stakeholders and economies and indeed environments, and so corporate activities both depend on and impact that system, and so whatever happens there [are] implications for the timing, amount, and certainty of future cash flows.” (C.S8)

Some interviewees even indicate that the definition of material topics should start from an inside-out perspective. First, organisations should perform an impact materiality assessment, and then the list of topics identified through this process should be assessed against their financial materiality, adopting an outside-in approach:

“I suppose, from our point of view, a lot of it is interlinked where we’ve looked. [...] why not focus on the ESG materiality side and then use that to filter into everything else that we’re doing.” (P4)

This view, which is predicated by previous research on double materiality (see Adams, Alhamood, He, Tian, Wang & Wang, 2021; Jørgensen, Mjøs & Pedersen, 2022), is also shared by users and standard setters. They argue that impact materiality should drive the initial consideration of material topics, because if financial materiality is assessed first, material issues from an impact perspective may end up being excluded from reports:

“[W]hat is relevant is how the company can affect the ecosystem in which it operates, in all areas, in the social, economic, and environmental spheres. [...] [T]his materiality approach should prevail over the financial approach because, otherwise, we could, perhaps, divert the choice towards issues that, at a given moment, [...] concern investors.” (U13)

“That’s the only way to have a strong sustainability and materiality analysis. [...] I’m talking about impact, and I think impact materiality is always the first one to be done and even the ISSB tells you this, right, you never ever start with a financial materiality analysis, that’s just wrong.” (B.S4)

What comes across clearly in the interviews is that risk represents the main link that explains the relationship between impact and financial materiality. Indeed, risk is perceived by most preparers, users and standard setters to be the key concept driving the connection between both reporting arenas, as sustainability impacts can become risks that could eventually affect firms' financials.

"[S]ustainability risks then incorporate financial risks as well. So, for every sustainability risk, we estimate the financial impact on the company." (P8)

"[T]hat's why we are also working on integrating the ESG risk into our risk management system. It is not a separate unit that will be working. We are spreading the ESG parameters or elements across all the key risks that we are monitoring." (P9)

Climate change-related aspects are considered the main sources of risk because their actual and potential effects on firms' financial performance are clearly understood. In this respect, climate change is the main topic that bridges sustainability and financial reporting to address the lack of connectivity in reporting practice.

"CO₂ emissions are going to have an impact on the accounts. In fact, they already have it. When we closed the coal plants, we had to depreciate our assets because they were effectively dismantled. We have also depreciated our combined cycles. In other words, especially in the area of climate change, I would say that they [impact and financial material impacts] do go very hand in hand." (P1)

"Decarbonisation is definitely the topic that is of high interest also to [the] community of financial investors. Carbon prices will increase in the future, shipping will become part of the ETS²⁴ [EU Emission Trading System]. So it has a direct relevance, so this is something [...] there's a big focus on." (P13)

Other sources of risks connecting sustainability and financial performance stem from reputation or the supply chain, as some interviewees also point out:

"If a company pollutes a river, even though there are no regulations that forbid it, and the fish begin to die, and the fauna begin to die, and the children also get sick, in the end, [...] the company may receive a fine or not, but at least it will suffer from the reputational risk of saying, 'Hey, you have destroyed a river, you have destroyed fauna.'" (U16)

"[I]n the apparel industry, large distributors, as a brand image, position, well, with all the issues of supply chain management, it is an issue that textiles have already assumed because it [...] affects their reputation and that affects the financial field." (U13)

24 The EU ETS is the cap-and-trade system put in place by the EU to reduce carbon emissions, companies subject to the system have to obtain emissions rights that are traded in a market to justify their annual emissions.

Financial capital providers are aware of the relevance of such risks, mainly when it comes to climate change, and are increasingly asking companies to integrate disclosures on sustainability topics in their financial reporting. As some interviewees explained, the interest of capital markets drives additional financial risks because access to funding may be threatened if firms fail to manage climate change effectively:

"From the investor side, we increasingly see every year that there are more and more investors who are interested in climate and who are also directly asking, for instance, our supervisory board, about how we plan to move to a 1.5-degree aligned business model and things like this, I think to otherwise pull their investments." (P8)

"[I]t's an evolving process [...], but will only increase. [...] In order to qualify for certain funding, if we don't meet some of these disclosure requirements and also [...] score very highly on them, then we won't get funding. It's as simple as that." (P2)

The consideration of sustainability-related financial risks calls for quantifying and measuring their potential financial impact on the financial reporting and, specifically, the financial statements. This quantification implies that firms eventually monetise some risks emerging from sustainability issues.

"[S]ustainability risks then incorporate financial risks, [...]. For every sustainability risk, we estimate the financial impact on the company and that then in turn goes to our risk committee reporting, [...] that they try to quantify all of our sustainability risks and opportunities fully in Euros." (P8)

Nonetheless, as suggested by previous research (Barker & Mayer, 2021), monetising the financial impact of sustainability issues may obstruct the implementation of an outside-in perspective, as monetising risks, especially those stemming from social issues, is problematic:

"[I]n the environmental part, we have it quite measured due to the climatic risks that we measure. In the social part, in terms, for example, of reputation or more intangibles, in this we have not yet made progress, we do not have tools or a methodology that can really be used." (P1)

"[B]ut we are not near monetisation. So, that's a bridge too far and I think it's good that there's some thinking going on on monetisation, but, at the moment, I would say it's really a long way from here." (U1)

In addition to risks, governance is the other topic that fosters the connections between impact and financial materiality. Many companies are setting up governance structures that directly engage in materiality assessments and drive the discussion of sustainability topics in financial reporting:

"We have a sustainability committee, which is our CEO, our CFO, and members of the exec; and then we have a board level one as well. [...] [E]verybody is involved. Our CFO is totally on board with anything sustainability, probably almost more than anybody else. He really sees it as this is what investors are after, so we need to answer their questions and have the information that they want." (P4)

"On the board we have a committee. It's a strategy and governance committee and they're also responsible for pre-discussions on sustainability, because sustainability is, at least it's our aim, an integral part of our strategy. But we are still working on aligning sustainability to the business strategy but at least the goal is that it's an integral part." (P6)

In contrast, one of the standard setters interviewed (B.S4) suggested that current governance arrangements can hinder these connections.

“[F]or me it’s when you look at the strategy of companies and then you open the sustainability part of the report, there’s so much disconnection [...]. The sustainability strategy is not presented in boards and risk committees and other committees. It’s not validated... The problem today is you have CEOs that are often short-lived, often at the end of their career, they’ll get their golden parachute and go and do something else, they’re often from a generation where sustainability meant nothing.” (B.S4)

To sum up, the interviews highlight that the “inside-out” and “outside-in” perspectives that are embedded in double materiality promote the connectivity between the sustainability and financial reporting fields. These perspectives are related to the economic notions of externalities and dependencies (Cooper & Michelon, 2022). The interviews highlight two important elements that can help bridge both materiality perspectives. First, they emphasise the notion of risk as a mechanism through which sustainability impacts may end up affecting the financial reporting. Second, they also point to certain types of sustainability issues for which the relevance of risks becomes more prominent. In addition to climate-related risks, the interviewees indicate reputation and supply chain risks drive the connections between impact and financial materiality. Despite the recognition of those elements bridging both reporting arenas, the difficulty in valuing their eventual impact on the financials hinders their effective integration in financial reporting. As a consequence of this problem, the literature is developing alternative proposals on how to address this (see Barker & Mayer, 2021²⁵). The interviews also show that companies are adapting their governance structures to help organisations manage the complexity of sustainability issues and evaluate the double perspective in which those issues may materialise, and the implications for the reporting process.

²⁵ Barker and Mayer (2021) reflect on financial reporting practice to imagine how corporate accounting can be extended to incorporate the growing recognition of firms’ role in maintaining the natural capital. Specifically, they suggest extending the profit measurement financial accounting produces based on registering business transactions by incorporating the impact of externalities.

Summary and implications

This report presents the key findings of an investigation into the connectivity between sustainability and financial reporting and the role of materiality assessments in their alignment. Our investigation relies on a mixed-method approach that combines a quantitative content analysis of data gathered from the sustainability, integrated and annual reports of a sample of European firms with a set of semi-structured interviews with preparers, users, and standard-setters. Our findings are predominantly informed by recent practice and views of key actors, and we acknowledge that this field is moving quickly, and reporting is evolving. It is, therefore, important to recognise that reporting in the future may be very different to what we have seen in the past. Nevertheless, our discussion below draws out the implications of our research for preparers, users, standard setters and policymakers, as well as providing some suggestions for further research.

Summary of key findings and discussion

The investigation of RQ1 (How are materiality assessments for sustainability reporting purposes aligned with financial reporting disclosures?) suggests that companies undertake different approaches to materiality assessments in sustainability reporting, with very few companies adopting a “pure” impact materiality (as per GRI definition) approach and most companies analysed adopting what could be described as a double materiality approach in which both the company and the stakeholders/impact views are considered. Overall, the analysis does not provide overwhelming evidence of misalignment between the sustainability and financial reporting in terms of which ESG issues are deemed as most material. Yet, interviews do not reveal systematic approaches to grant or pursue such alignment, in that the underlying reporting processes are often siloed and disconnected. Regulation, however, is deemed a factor encouraging more collaborative practices.

The interviews highlighted several challenges faced by companies when adopting a double materiality perspective (RQ2), which we can classify into three broad groups:

1. **Technical challenges:** these mainly relate to determining the threshold to define the topics to be reported as well as considering the time horizons to which these sustainability topics refer. Stakeholder engagement is a key tool in identifying material topics, but even when materiality assessments are conducted in this way (and hence companies attempt to co-determine material topics with stakeholders), it is not necessarily the case that stakeholders involved in the process have the appropriate knowledge and expertise about the issue and/or its effect on the organisation. Furthermore, issues may also arise regarding the importance attached to different stakeholder views when analysing and weighting their responses.
2. **“Cultural” challenges:** some businesses may not regard sustainability issues as core to the business, or at least not as such until they become a regulatory or market matter. Research in accounting points towards the voluntary adoption of sustainability reporting as a reputation risk management exercise rather than an accountability one (Bebbington, Larrinaga & Moneva, 2008). While it is possible that regulatory pressure for disclosures on some sustainability issues – for example, climate change – may foster this connectivity, the alignment may not be necessarily implemented unless the organisational units in charge of financial reporting and sustainability reporting, as well as the processes to produce the two accounts, are more integrated.
3. **Institutional challenges:** standard setting in sustainability reporting is currently fragmented, and this is perceived as a burden for businesses, especially large organisations that may be listed in different markets and hence may be required to comply with various regulations. The need for companies to reconcile or at least navigate guidance from multiple standard setters is seen as creating more organisational complexities in reporting practices.

In terms of the links that explain the connections between impact and financial materiality (RQ3), the interview evidence points towards notions of risk and corporate governance as useful elements that allow businesses to navigate complex sustainability issues. Climate change as a financial risk in this sense is an example of a sustainability issue that is enhancing the connectivity between sustainability and financial reporting. This is because the likelihood of disruptions due to extreme weather conditions can now be more reliably estimated and, therefore, financial implications quantified, but also because of increased regulatory pressure around net-zero and the transition to a carbon neutral economy as the need for urgent climate action is understood with more certainty. As the time horizon for climate shortens, so it becomes of increasing materiality for financial reporting and is leading companies to consider how this may affect their business model. As such, companies implement governance processes to deal with such key strategic implications.

Reflecting on the technical, cultural, and institutional challenges that we identify in our research, and considering the evidence on how preparers, users and standard setters see the connectivity between sustainability and financial reporting, we attempt to provide some guidance on whether the concept of materiality can be meaningfully adapted from financial reporting or if a new evaluative concept should be considered. Overall, it seems that materiality solely conceived as a principle for decision usefulness (as it is currently set up, for example, in the IFRS Conceptual Framework) bears several challenges:

- Users of sustainability information are not confined to investors and there are different approaches to identifying the most relevant stakeholders. Users, both within the investment community and more broadly, may have different needs, which inform their decisions; hence what is useful information in the context of different decisions cannot be univocally identified.
- The dynamic way in which sustainability issues may become directly relevant for the business model and performance is uncertain, and implies that time horizons for assessing corporate impacts vis a vis financial implications are not aligned. This issue, in turn, implies that underlying assumptions for managing and quantifying risks are hard to determine. In other words, sustainability impacts may continue to be treated as uncertainties rather than risks until contextual circumstances make preparers and users more aware and knowledgeable about the probabilities of the potential outcomes (e.g. regulatory action).
- In sustainability reporting, information is relevant if it informs about corporate impacts in the wider context of sustainable development. In this context, the purpose of reporting is not just to inform decisions, but to provide a transparent account of how an organisation contributes positively or negatively to sustainable development.

Overall, the challenges mentioned above all speak to the fact that the purpose of sustainability reporting is hardly confined to informing investors' decisions but, more broadly, empowers organisations to understand and manage their contribution to sustainable development. As such, it seems inevitable that to fulfil this role, materiality approaches should embed as much as possible expectations and objectives informed by sustainability science and be reflected in broader sustainability frameworks, such as the UN Sustainable Development Goals and the Intergovernmental Panel on Climate Change.

While proposing a new notion of materiality is beyond the scope of this report, the overview of the challenges reported above can fruitfully contribute to the current standard setting and regulatory debate on the materiality principle.

Implications of the research for preparers

Despite the recognition of the importance of the connectivity between sustainability and financial reporting through “outside-in” and “inside-out” perspectives embedded in double materiality, companies fail to effectively operationalise it in their reporting practices. To guarantee that organisations cover all relevant sustainability topics from impact and financial approaches, their materiality assessment should start with evaluating impact materiality to then assess which of the relevant impacts could be material from a financial perspective. However, sustainability reporting materiality assessments have a limited impact on driving the inclusion of sustainability topics in financial reporting in current corporate practice. To overcome this issue, companies need to foster cooperation between their sustainability and financial reporting teams to enable connectivity between both reporting arenas, so that the identification of impact material issues feeds into the financial reporting process. This collaborative work would not only improve materiality assessments but will also contribute to increasing consistency between the information produced by both teams.

Firms should also pay attention to how they design their stakeholder engagement processes for the purpose of materiality assessments. If they wish to identify what sustainability topics are material from both an impact and financial materiality perspective, a broad stakeholder base should be consulted through active and bi-directional engagements. Nonetheless, the broadness of the engagement should not lead to the inclusion of unrelated stakeholders and so firms should first identify relevant stakeholders to include both those that can influence them and those that are affected by their activities. Organisations should ensure a fair representative stakeholder base of knowledgeable external and internal stakeholders.

Implications of the research for users

The different approaches to materiality assessment have implications for the sustainability information disclosed by firms and for the connectivity between their financial and sustainability reporting. Users need to be cognisant of the potential disconnect and that sustainability information may be disclosed by companies in different reports and locations. Both corporate governance and risk are key elements through which organisations may navigate complex sustainability issues and so users need to pay particular attention to these within their considerations. This may be through the corporate governance and risk disclosures within both financial and sustainability reporting or more directly through their engagement with the firm.

Different users also need to engage with an organisation's materiality assessment process if this is to appropriately incorporate their concerns. Such engagement is important if the process is to be representative. It is also essential, however, that users are able to bring an informed perspective to this process, and this requires an undertaking to develop their understanding of the sustainability context and its complexity. This knowledge can draw upon developments within sustainability reporting standards and regulations as well as broader frameworks and evidence from both sustainability science and social science research.

Implications of the research for standard setters and policymakers

The future of sustainability reporting practice will be shaped by the interaction between the standards produced by three bodies with different approaches to materiality: EFRAG, ISSB and GRI. These alternative perspectives may hinder materiality assessment processes and the usefulness of their outcome, as they may lead to the identification of a significant number of material topics and/or the exclusion of material aspects from one perspective but not from the others. To solve this issue, standard setters should cooperate to ensure their compatibility. Initial steps have already been taken, as the three standard setters have announced their cooperation. Nonetheless, it is paramount that these efforts materialise in compatible prescriptions in the standards that EFRAG and ISSB will produce. Additionally, these bodies should provide clear guidance on how materiality is to be understood and the process that organisations should establish to carry out materiality assessments. The guidance should especially focus on the challenges that currently affect practice, such as the determination of thresholds, or the quantification of impacts, to ensure the robustness and consistency of those processes.

In terms of policymaking, this report highlights the functionality of regulation in driving the connectivity between sustainability and financial reporting. This push is not only generated by the enactment of reporting mandates that call for applying double materiality, such as the EU Corporate Sustainability Reporting Directive, but also by regulating sustainability issues in a way that has financial implications for firms, either directly or by requiring them to transition towards a more sustainable business model. This regulatory push is developing at a different pace for the numerous sustainability issues of concern, but it is shown most clearly, for instance, by the growing regulation on climate change and our interviewees identify this sustainability topic as one of the main elements bridging sustainability and financial reporting.

Implications for future research

Sustainability reporting and its associated standard setting have developed recently, but it remains contested and further developments are to be expected. We suggest five key areas for future research.

First, we find that whilst most firms in our sample adopted a double materiality approach, there remains variation in how this is applied by different preparers. We also find that there are specific challenges regarding the flexibility available in setting materiality thresholds. These include issues relating to identifying relevant stakeholders with appropriate knowledge and skills to represent different sustainability concerns with some calls for science (including sustainability science and social science) to also inform this process. Further research is needed to study how preparers develop their materiality assessment processes of stakeholder engagement and materiality threshold setting as this practice becomes more established over time.

Second, we find that within our sample, whilst there are some differences in sustainability information disclosed, there is no overwhelming evidence of misalignment between sustainability and financial reporting. Further research can examine the connectivity of sustainability and financial reporting in different industries and regions. We have developed a novel research approach to quantitatively capture and analyse the alignment of ESG pillars across annual financial and sustainability reporting, which can be replicated to better understand specific sector and regional differences more broadly.

Third, further research is required to unravel how sustainability reporting and financial reporting practices develop to become more interconnected over time. Our findings suggest that financial and sustainability reporting processes are often siloed and disconnected, although report preparers recognise the potential for greater connectivity. Qualitative research is needed to explore how the application of double materiality and materiality assessment processes may, or may not, strengthen these connections, as the dynamic relationship between impact materiality and financial materiality is better understood. Associated with this is the possibility of further studying how risk management and corporate governance arrangements can enable a more integrated understanding of sustainability from both inside-out and outside-in perspectives.

Fourth, broader research is required to understand the extent to which different users, including investors and broader stakeholders, are able, or not, to use sustainability information to hold organisations accountable for their impacts and/or inform their decisions. We found users had mixed views on the usefulness of the materiality assessments undertaken by organisations, with some preferring to make their own judgement on an organisation's material topics. Moreover, standard setters, for example the GRI, are developing sector-specific standards which may further affect users' evaluation of a firm's materiality assessment. Further research can explore in more detail how different stakeholders view both materiality assessments and the sustainability disclosures they find to be informative. Our research identified some concerns regarding the appropriateness of stakeholder engagement processes and the flexibility in setting thresholds, with some calls for a more science-based approach. Further research could explore in more detail the role of science-based evidence and targets in materiality assessment processes.

Finally, as the ISSB, EFRAG and GRI continue to develop their standards, research will be required to explore the standard setting processes and their implications for sustainability report preparers and users. Our study identified a concern over the fragmentation within the sustainability standard setting arena and a desire for at least some degree of consistency and compatibility between the different standards. Future research can study how the different standard setters develop, or not, their processes to be cognisant of and compatible with those of other standard setters. Specifically, research can trace how the conceptualisations of materiality evolve within each standard setting process and the extent to which these converge or complement each other.

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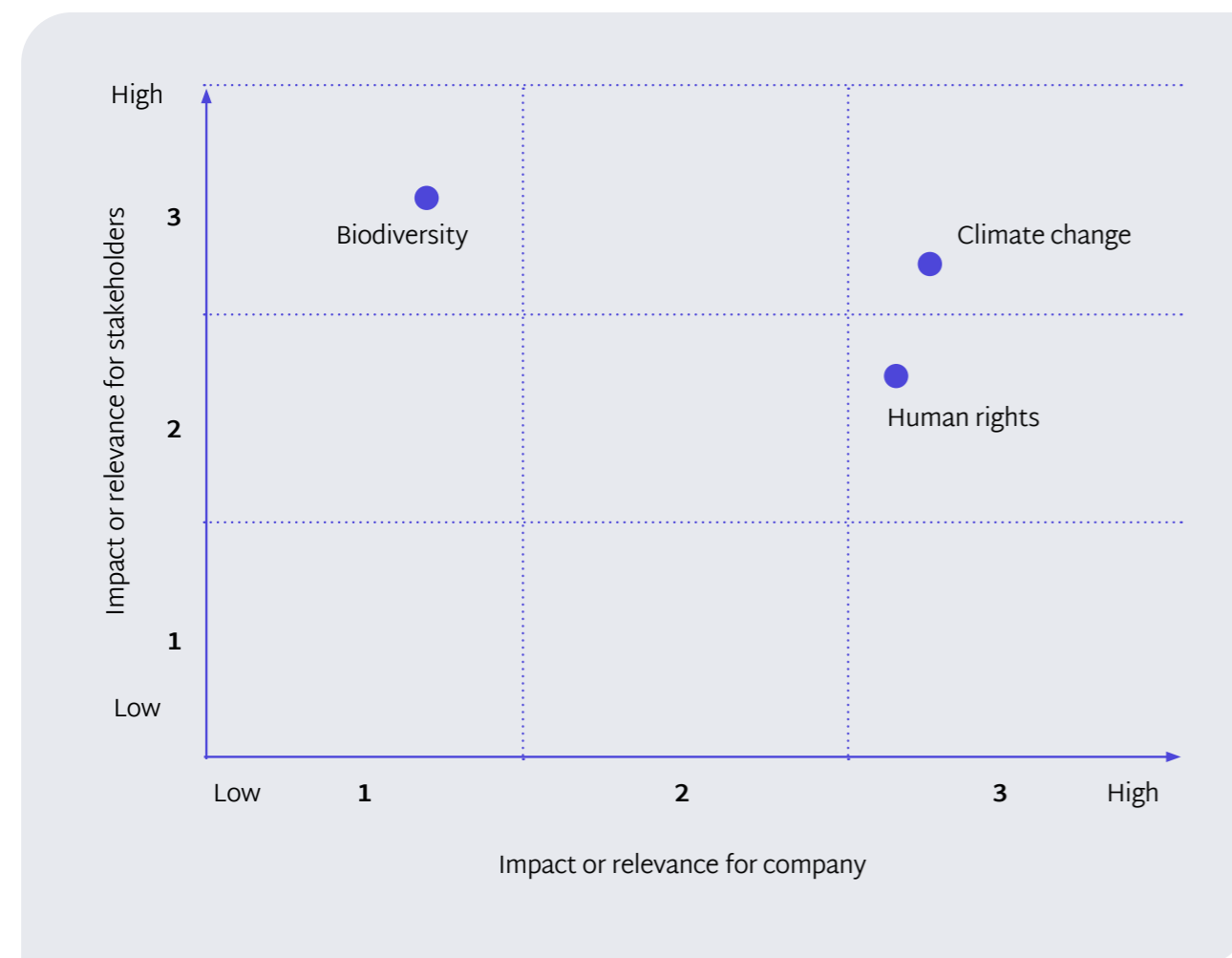
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Appendix 1 – Analysis of materiality matrixes and examples

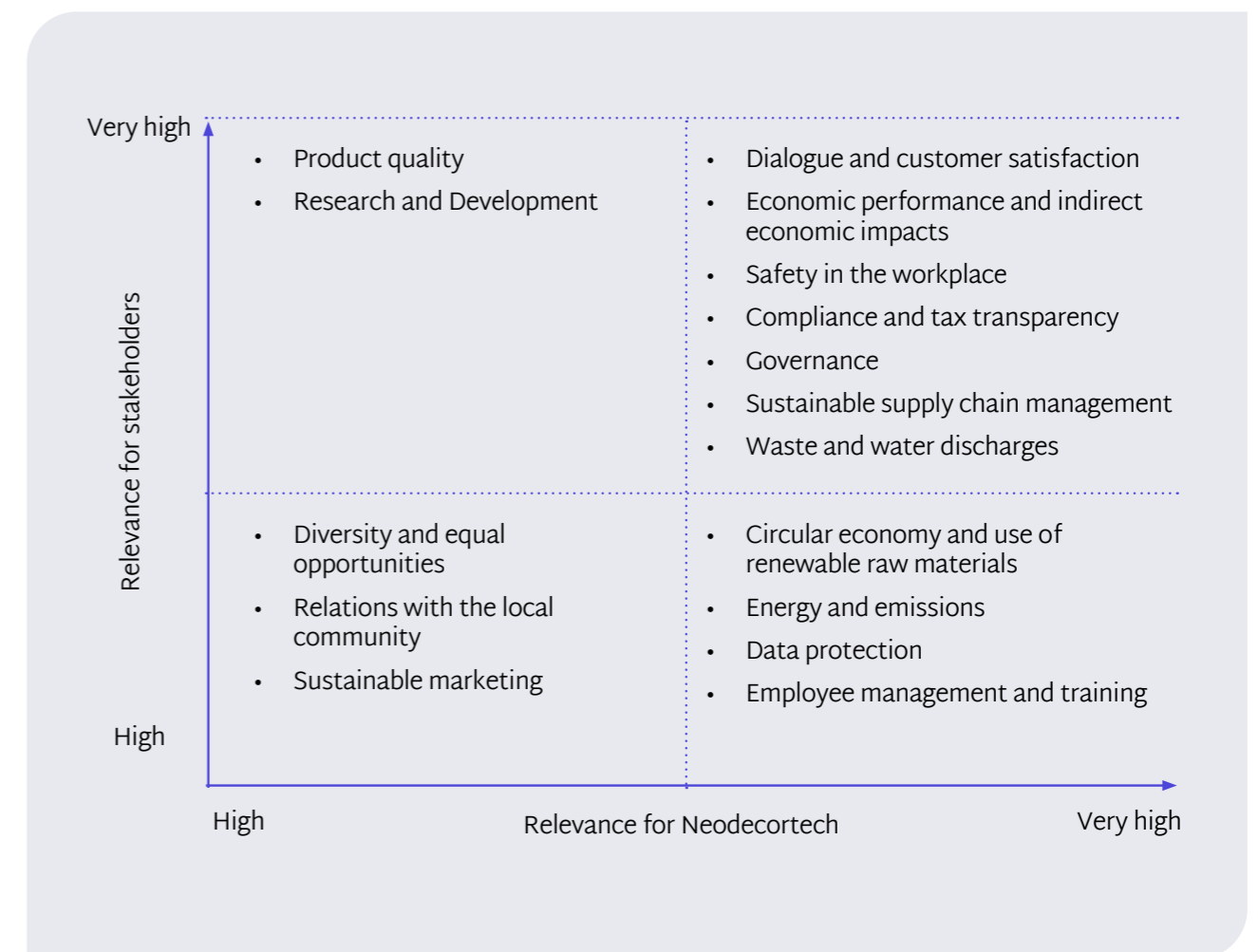
For each report we collected: the presence of a materiality matrix (if any), the labels of the axes of the materiality matrix (if any) and the ranking/positions of material items in the materiality matrix (if any) according to their relative distance from the two axes. Operationally, each matrix analysed was split into nine cells, so that each material topic was assigned a score along the two axes depending on its position. For example, a material topic in the upper right cell was assigned a score of 3 along the dimension depicted in the x axis and 3 along the dimension captured in the y axis; a material topic in the central cell was assigned (2,2); a topic in the cell just below (2,2) would have been coded as (2,1), and so on. This process allows us to measure how material the different topics for the firms in the sample are, but also to get a comprehensive understanding of the criteria chosen to identify material items (e.g., the dimensions on the axes of the matrix).

Example 1



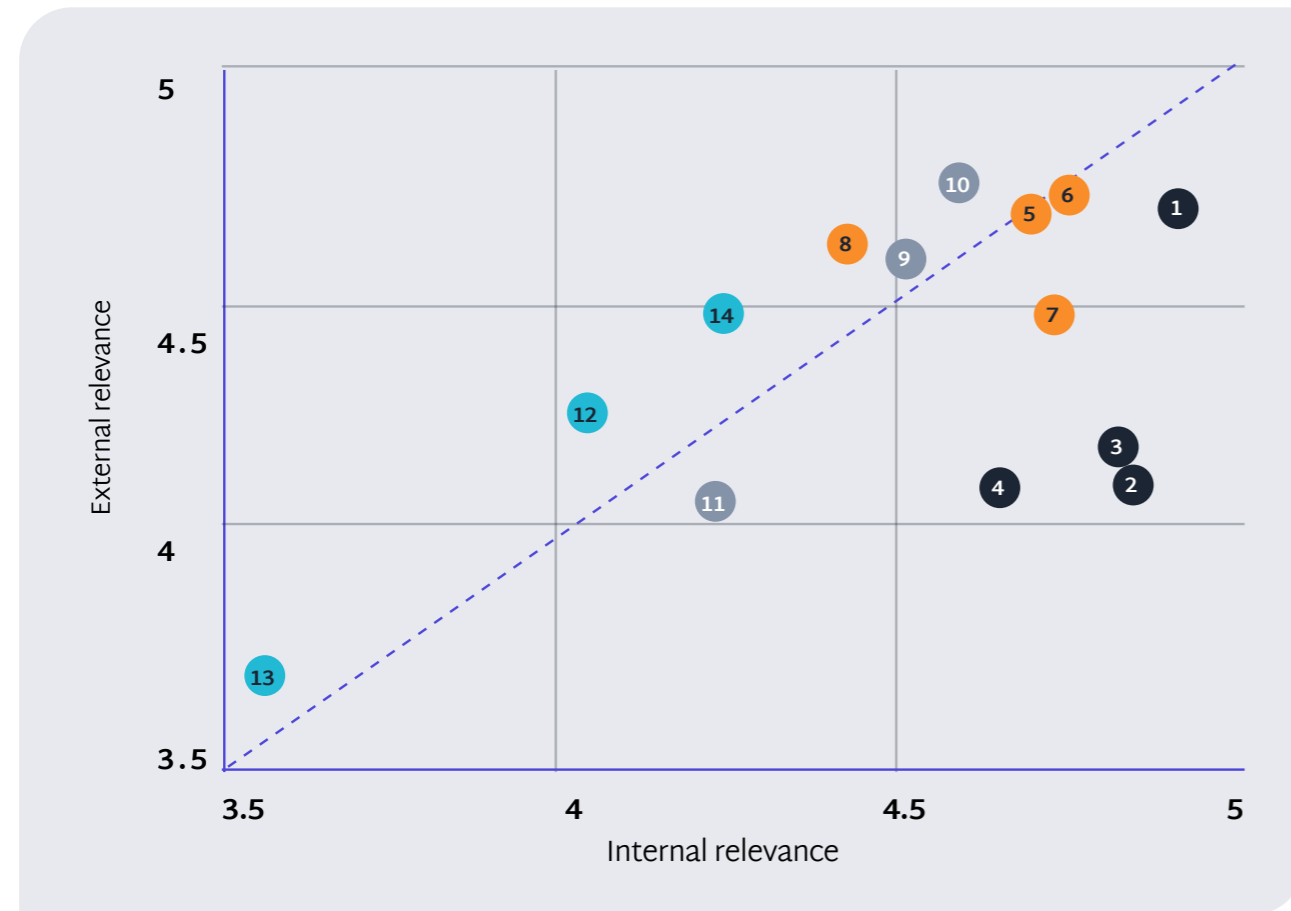
Example 1 shows a materiality matrix which considers company relevance and stakeholder relevance as the two key dimensions and is split into nine cells. In our coding “biodiversity” is assigned with (1, 3), “climate change” with (3,3) and “human rights” with (3,2).

Example 2



Example 2 shows a materiality matrix which considers company relevance and stakeholder relevance as the two key dimensions. However, it is split into four cells. Since the relevance degree starts from “High”, we assume there the relevance of material topics in the matrix starts from degree “2”. For example, “product quality” is assigned with (2,3); “dialogue and customer satisfaction” with (3,3); “diversity and equal opportunities” with (2,2) and “energy and emissions” with (3,2).

Example 3



Ifis Integrity

- 1 Corporate Integrity and Anti-Corruption
- 2 Credit Quality
- 3 Data Protection
- 4 Brand Reputation

Ifis People

- 9 Employee well-being
- 10 Promotion and development of employees
- 11 Diversity and inclusion

Ifis Customers

- 5 Support to Entrepreneurship and Financial inclusion
- 6 Digital Innovation
- 7 Quality of products and services
- 8 Transparency of information on products and services

Ifis Responsibility

- 12 Sustainable finance
- 13 Commitment to local communities
- 14 Direct environmental impacts

Example 3 shows a materiality matrix which considers “internal relevance” and “external relevance” as the two key dimensions. There are three levels of degrees of materiality in the matrix and thus nine cells. Materiality topic “Commitment to local communities” is assigned with (1,1); “Sustainable finance” with (2,2); “Transparency of information on products and services” with (2,3); “Credit quality” with (3,2) and “Digital innovation” with (3,3).

Example 4

Material topics and summary of main impacts				
GRI topic	Supply chain	Volvo Group	Customers and society	Comment on the main impacts and boundaries
Economic performance	•	•	•	Risks and opportunities mainly relate to the transitional aspects of customer demands, emission regulation, technology development and scarce materials
Energy and emissions	•	•	•	Reducing environmental impacts from customer's use of our products is a key business driver. Over 95% of energy and emissions related to the product's lifecycle occur in the customer use phase. It is also important to reduce emissions in Volvo Group's own operations and transportation of goods
Waste, water and environmental compliance	•	•		Environmental footprint from own operations, including energy and emissions are managed by a Group wide environment management system
Employment		•		Continuously improving workplaces, creating jobs and adapting to market demands are primarily tied to the Group's own operations
Labor management relations		•		A respectful social dialogue creates better workplaces and can help effective management of operations
Diversity and equal opportunities		•		Diversity drives performance for the Group and equal opportunities in the community
Training and education		•	•	Training enables matching of competency to needs for employees, the Volvo Group and customer and helps to create employment opportunities
Occupational health and safety	•	•		The main focus is on own operations and employees' work situation but also a significant part of supplier requirement
Consumer health and safety			•	Health and safety related to the product use phase and the wider impact on road safety and end users' occupational safety
Supplier environmental and social assessments	•			Suppliers make up the extended operations of the Group. Influence is mainly bound to tier one and focus areas are social topics as well as innovation for reduced environmental impact
Human rights (including sub-topics)	•	•	•	Includes potential human rights impacts within Volvo Group's operations, the supply chain, operations of business partners and in relation to the use of sold products
Anti-corruption	•	•	•	Volvo Group condemns all form of corruption. It distorts the market, interfere with free competition, violate laws and undermine social development

Example 4 illustrates a case in which there is no visualisation of a materiality matrix but a list of material topics with reference to three dimensions: supply chain, company (“Volvo Group”), customer and society. Overall, these three dimensions do refer to the perspectives of the company vs. stakeholders. However, because there is no matrix, the position (ranking) of those material topics was not recorded.

Appendix 2. Example of key material topics and authors' reclassification into information pillars.

Topics (examples)	Pillar
Board effectiveness	Board, accountability and monitoring
ESG Governance structure	Board, accountability and monitoring
Executive compensation	Board, accountability and monitoring
Noise pollution	Business impact
Sustainable building management	Business impact
Business model innovation	Business sustainability
Corporate reputation	Business sustainability
Long-term value creation	Business sustainability
Business ethics	Corporate culture and values
Corporate culture	Corporate culture and values
Public policy practices	Public policy
Stakeholder engagement	Stakeholder engagement
Responsible procurement	Supply chain responsibility
Responsible tax practices	Tax
corporate citizenship	Citizenship
Physical disasters & failures	Environmental/Social risks
Political & societal risk	Environmental/Social risks
Biodiversity	Biodiversity
Managing land use & reducing deforestation	Biodiversity
Air emissions	Climate change
Transition to a circular economy	Climate change
Alternative fuels	Energy
Transition to renewable energy	Energy
Materials management	Materials
Plastics management	Materials
Hazardous waste management	Waste
Recycling, waste recovery & reduction	Waste
Water pollution	Water
Community support & development	Community
Consumer rights	Customer
Customer satisfaction	Customer
Fair & equitable compensation	DEI
Social inclusion	DEI

Employee acquisition & retention	Employees
Employee incentives & benefits	Employees
Human rights	Human rights
Indigenous populations	Human rights
Cybersecurity & information security	IT
Digital transformation	IT
Marketing & selling practices	Product responsibility
Product & service safety & quality	Product responsibility

Appendix 3. Example of algorithm extraction.

Transocean Ltd	Text from the relevant paragraph		
Sentence as in Company's sustainability report 2019	Our purpose. Why? If one asks that question enough times, peels back enough of those motivational layers, it's possible to catch a glimpse of the fundamental core of identity — revealing, in other words, the who. As an energy business, our success is predicated upon the value we deliver to our customers, our shareholders and our stakeholders. But it is equally self-evident that, as an energy business, we must operate with integrity, discipline and an unconditional respect for our people, our communities and our planet. As we did last year, we preface our 2019 Sustainability Report with the Transocean FIRST values. As reflected in this year's theme, those values do not change, even though the world around us may shift in ways we would never have expected. Collectively, they serve as our North Star, providing the guidance to keep us on course towards the goals we have set for our company. The purpose of this report is to assess our progress, note any course corrections made to accommodate changing circumstances or take advantage of changing technologies and, ultimately, to reaffirm our intention to achieve our goals.		
Count frequency for each ESG pillars	Corporate Governance	Board, accountability and monitoring	0
		Business impact	1
		Business sustainability	0
		Corporate culture	0
		Public policy	0
		Stakeholder engagement	0
		Supply chain responsibility	0
		Citizenship	1
		Environmental/Social risks	0
		Taxation	0
	Environment	Biodiversity	0
		Climate change	0
		Energy	2
		Materials	0
		Waste	0
	Social	Water	0
		Diversity Equity and Inclusion	0
		Community	1
		Customer	0
		Employees	1
		Human rights	0
		IT	0
		Product responsibility	0

Appendix 4. Interview protocols

Preparers

Sustainability team and/or finance team

1. Can you provide a brief overview of your current role and responsibilities?
2. What is sustainability for your organisation? Do sustainability issues impact your role, and if so, how?

Defining sustainability reporting

3. What is sustainability reporting for your organisation?
 - a. What is the purpose of sustainability reporting for your organisation?
 - b. Which audience is it directed to?
4. What is your organisation's prior exposure to sustainability reporting regulation or voluntary sustainability reporting experience?
5. How do you understand materiality assessments in the context of sustainability reporting?
6. How is the materiality assessment process carried out for sustainability information?
 - a. How do you decide on thresholds?
 - b. Who do you consult as part of the materiality process and who do you think you should consult?
7. What are the key challenges to be overcome when assessing materiality? Do they differ depending on whether the assessment is for financial reporting or sustainability reporting purposes?
 - a. Do you believe that the concept of materiality can be meaningfully adapted from financial reporting or should a new evaluative concept be considered?
8. Does sustainability information matter for the financial reporting process? If so, how so?
9. Do you carry out assurance of sustainability information? What type of assurance (ex. internal/external, reasonable/limited)? What are the key challenges in doing so?

Connectivity

10. What are your organisation's governance & management structures and processes for sustainability issues?
11. How do you come to understand which sustainability topics matter for both broader sustainable development and for the sustainability of your organisation?
 - a. What role do industry-specific initiatives and/or regulation play in this matter?
12. How does your business affect sustainability issues broadly speaking?
 - a. Which aspects of the business model affect the SDGs and how?
 - b. What are the most material social and environmental impacts you report? How do you identify and manage them?
13. How do sustainability issues impact the business model and the financials? How do you come to identify sustainability risks and opportunities?

14. Do you think there is a connection between financial and impact materiality? And if so, how do you identify and manage this connection? And in terms of reporting?
 - a. Can you provide some examples of the financial impact of sustainability issues?
 - b. Can you give us examples of connections between various sustainability issues among each other?
15. What are the challenges to identifying material sustainability issues and topics? Are these challenges different when you carry out materiality assessment for the sustainability report vis a vis financial reporting?
 - a. What's the role of the "users" of information in assessing material sustainability risks and opportunities for your organisation?
 - b. How are time horizons embedded in the materiality assessments?
 - c. How do you consider the different degrees of uncertainty associated with sustainability?
16. How has materiality in the way in which your organisation has perceived and applied it impacted your organisation's sustainability and financial reporting and related actions?
 - a. Do you use sustainability information for internal decision-making? How?
 - b. Do you think the IFRS Conceptual Framework is compatible with a principle for impact materiality? Why or why not?

Future of standard setting

17. There are some on-going changes in sustainability reporting standard setting. Are you aware of them? What is your view about where they will end up?
 - a. Do you think the GRI standards are a good set of standards? Why?
 - b. Are you familiar with the ESRS and ISSB EDs? What is your take on recent developments?
18. Overall, how do you envisage the future of sustainability reporting?

Users

1. Please can you provide a brief overview of your current role and responsibilities?
2. What does sustainability mean to you? And sustainability reporting?
3. Why are sustainability issues relevant for your decision-making?
4. How do sustainability issues enter into your decision-making process?
5. What are the key challenges you face when you consider sustainability issues in your decision-making process?
6. Do you believe companies have adequate materiality determination processes in place when it comes to sustainability reporting? Are they clearly explained and discussed or do you need to infer them somehow?
7. Do you think the materiality processes are adequate for assessing which sustainability issues might affect financial reporting?
8. Do you engage with companies to help them improve their corporate impacts and better manage sustainability risks? Can you give us some examples of such engagements?
9. Do you think there is a connection between financial and impact materiality and if so,
 - a. Do you think such a connection is apparent in the reporting practices of organisations?
 - b. Does one materiality type matter more than the other and why?

10. How do you embed long-term considerations in your decision-making and how does uncertainty associated with sustainability risks and opportunities affect it?
11. There are some ongoing changes in sustainability reporting standard setting. Are you aware of them? What is your view about where they will end up?
 - a. Do you think the GRI standards are a good set of standards? Why?
 - b. Are you familiar with the ESRS and ISSB EDs? What is your take on recent developments?
12. Overall, how do you envisage the future of sustainability reporting?

Standard setters

1. Please, can you provide a brief overview of your current role and responsibilities?
2. How does your organisation understand sustainability? and sustainability reporting?
3. In your view, what is the main purpose of sustainability reporting?
4. What does materiality mean for your organisation in the context of sustainability reporting?
 - a. Essentially, there are two types of materiality in this context: impact and financial materiality. Do you think they are related? And if so, how?
5. What are your expectations about materiality assessments in the context of sustainability information?
6. Can you tell us the key challenges you face when developing "standards" for sustainability reporting?
 - a. How did you approach building the portfolio of expertise to deal with sustainability issues?
7. Has your organisation consulted potential users and other stakeholders in the process of developing sustainability reporting standards? If so, who?
8. What do you think users of sustainability information are looking for when it comes to "material" information?
 - a. Going back to materiality assessments, what do you think users expect from preparers?
9. Which key challenges do you think companies experience when preparing a sustainability report or including sustainability issues in their financial reports? How integrated do you think these two types of reports are or should be?
10. How do you think companies deal with the issue of determining materiality in the context of sustainability reporting?
11. To what extent do you think sustainability issues are relevant from a financial perspective?
12. What is your view about how the field will evolve?




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