

# Regulatory technologies for enhancing sustainability compliance: a multivocal literature review

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## Abstract

**Purpose** – As sustainability regulations tighten, Regulatory Technologies (RegTech) solutions have become more crucial, enabling real-time monitoring, predictive risk analytics, automated reporting and data-driven decision-making to support compliance. The purpose of this study is to synthesize the existing body of knowledge from academic and gray literature – including insights from researchers, industry and governing authorities – to assess the capabilities enabled, challenges and limitations of using RegTech solutions for sustainability compliance.

**Design/methodology/approach** – A multivocal literature review approach was applied to synthesize insights from academic literature and gray literature. We adopt an information systems capabilities lens to assess how RegTech supports sustainability-related compliance needs. Given that RegTech is an emerging field where much of the practical development and discussions about RegTech and compliance technologies occur outside academia, a multivocal literature review approach bridges the gap between academia and industry and ensures a comprehensive and holistic analysis.

**Findings** – The findings reveal that RegTech enables automated compliance monitoring, and environmental, social and governance (ESG) risk management, enhances transparency in reporting and offers tools to mitigate greenwashing risks while also supporting sustainable investment and digital finance. In addition, varying maturity levels across platforms, high implementation costs and cybersecurity risks present further adoption challenges.

**Practical implications** – To fully harness RegTech's potential, interdisciplinary collaboration is crucial. Researchers in sustainability, finance, law, management and information systems should work together to develop frameworks, empirical studies and policy recommendations that address the operational, ethical and technical dimensions of RegTech. Strengthening partnerships between academia, industry and policymakers can help bridge the gap between conceptual research and practical implementation, ensuring that RegTech solutions are both effective and ethically sound. For industry, the integration of RegTech solutions presents a significant opportunity to improve sustainability compliance while reducing regulatory burden. Financial institutions, corporations and technology providers should prioritize investments in scalable and interoperable RegTech solutions that align with emerging regulatory and sustainability reporting standards such as the Corporate Sustainability Reporting Directive, Sustainable Finance Disclosure Regulation and global ESG disclosure standards.

**Originality/value** – This study's originality lies in its comprehensive synthesis of academic and gray literature to evaluate the role of RegTech in sustainability compliance, a critical yet unexplored topic. Moreover, the study provides valuable insights for researchers, policymakers, regulators and practitioners on advancing standardized terminology across disciplines regarding the RegTech phenomenon and offers strategies and insights to enhance RegTech's potential in driving sustainability compliance.

**Keywords** Sustainability, Regulation, Compliance, Information systems capabilities, Regulatory technology

**Paper type** Literature review



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## 1. Introduction

The growing urgency of sustainability in business and demand from consumers has driven a surge in new regulations, particularly those addressing environmental, social and governance (ESG) criteria. In the European Union (EU), regulatory initiatives such as the Corporate Sustainability Reporting Directive (CSRD), Sustainable Finance Disclosure Regulation (SFDR), Corporate Sustainability Due Diligence Directive (CSDDD) and Taxonomy Regulation require corporations and financial institutions to adopt sustainability-focused strategies, monitor compliance and ensure transparent reporting. These demands, aligned with frameworks such as the United Nations Sustainable Development Goals (SDGs), have created unprecedented compliance challenges for companies to manage complex and large-scale compliance data and operations while ensuring accurate, efficient and scalable mechanisms for regulatory oversight and reporting.

Regulatory technology (RegTech) has emerged as a response to these challenges. RegTechs are IT-based solutions that leverage data intelligently from diverse sources to provide critical information systems capabilities (ISC) and support corporations' and financial institutions' compliance efforts. It is due to digital technologies' increased performance and availability of data that the role of RegTechs in facilitating regulatory compliance has grown, garnering increased attention from both academia and industry in recent years (Arner *et al.*, 2018; Butler *et al.*, 2023; Butler and O'Brien, 2019; Gasparri, 2019; Johansson *et al.*, 2019). Existing studies on RegTechs have primarily focused on traditional compliance domains, such as anti-money laundering (AML) and financial fraud, while their application to sustainability compliance remains underexplored.

To address this gap, we conducted a multivocal literature review (MLR) that systematically integrates insights from both academic and gray literature. This approach is particularly suitable for emerging fields like RegTech in sustainability compliance, where formal academic research is still nascent but industry and regulatory developments are advancing rapidly. Our review includes 29 academic articles and 30 gray literature documents that passed defined inclusion and quality criteria.

While these 59 sources form the core of our systematic analysis, this article draws on a total of 129 referenced works. The additional references – conceptual and empirical studies on RegTech, sustainability reporting, ESG investing, digital governance and related RegTechs – were not included in the formal analysis to preserve methodological rigor and scope focus. However, they play a critical role in positioning the research domain, contextualizing RegTech's evolution, and supporting the interpretation of findings. We chose not to expand the analysis to include all potentially relevant digital sustainability technologies, as this would have opened a broader and less analytically tractable review scope. Instead, the article builds on a carefully curated and conceptually grounded knowledge base to ensure both analytical depth and broader relevance.

To provide theoretical anchoring and structured interpretation of the findings, we adopt an ISC framework (Feeny and Willcocks, 1998; Karimi *et al.*, 2007; Aydiner *et al.*, 2019). The three key capability dimensions of ISC: IT infrastructure, human and relationship, capture well the multifaceted ways in which RegTech solutions can, may or fail to contribute to effective sustainability compliance. Applying this framework provides a practical yet theory-informed lens that enables the integration of insights across academic and practitioner domains without overdetermining the scope of the review.

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Our MLR is guided by two research questions:

- RQ1.* What is the current state of research on RegTech in enhancing sustainability compliance, what research methods have been employed, and what aspects have been explored? and
- RQ2.* What capabilities does RegTech offer, and how do they contribute to sustainability compliance demands?

The remainder of the article is structured as follows. We begin by establishing conceptual foundations by reviewing the evolution of RegTech, regulatory compliance and sustainability. We then describe the methodology of the MLR, including the selection and quality assessment of sources. The findings section synthesizes insights on the capabilities RegTech provides for sustainability compliance, the challenges of adoption and the role of data infrastructures. Finally, we discuss implications for practice, policy and future research, and conclude by identifying key research gaps and directions for advancing the field.

## **2. RegTech, compliance, sustainability, information systems capabilities**

This introductory section establishes the foundation for exploring RegTechs in the context of sustainability compliance. It traces the evolution of RegTech and its key capabilities, explores its intersection with sustainability compliance, introduces the ISC framework and explains its relevance for analyzing articles and studies about RegTech and sustainability compliance.

### *2.1 Regulatory technology for compliance*

RegTechs are software-based information systems (IS) solutions that utilize data to enhance and support compliance with regulatory requirements ([Silverberg et al., 2016](#)). RegTech emerged as a response to the growing demands and complexity of regulatory requirements following the 2008 financial crisis and the subsequent wave of global regulatory reforms ([Arner et al., 2018](#); [Butler et al., 2023](#); [Freij, 2020](#)). RegTech provides IS capabilities by offering automated solutions that improve regulatory reporting, streamline compliance processes and support compliance practices ([Arner et al., 2016](#); [Cai et al., 2022](#)). Advances in information technologies, such as artificial intelligence (AI), machine learning (ML), cloud computing and big data analytics, have enabled advances in automation and leaps in the efficiency of compliance processes ([Bolton and Mintrom, 2023](#)).

A key advantage of RegTech over traditional, manual and human-centered compliance management is its speed, precision and ability to process vast amounts of data in real time. For instance, RegTech tools can automate the collection, analysis and reporting of compliance-related data, reducing the burden on human resources and minimizing the risk of errors ([Freij, 2020](#)). Beyond its operational benefits, RegTech also empowers regulatory authorities by enhancing their supervisory and monitoring capabilities, enabling real-time detection of risks such as market instability, liquidity shortfalls and sustainability-related issues ([Grassi and Lanfranchi, 2022](#)).

### *2.2 Sustainability compliance*

Regulatory compliance requires organizations to adhere to legal and regulatory frameworks established by authorities. In recent years, sustainability-focused regulations have gained prominence, driven by global frameworks such as the United Nations SDGs. These regulations

emphasize transparency, accountability and the integration of ESG considerations into business operations. For example, the EU's Taxonomy Regulation and CSRD mandate detailed ESG disclosures, pushing companies to adopt sustainability-focused strategies and improve their reporting mechanisms (European Commission, 2018).

Sustainability compliance is further influenced by consumer demand for socially and environmentally responsible products and services. Achieving sustainable development requires integrating ESG considerations and harmonizing these three dimensions to provide a reliable foundation for sustainable development (Goodland, 1995). The ESG framework encompasses factors that are rooted in responsible investing. Responsible investing integrates ESG factors into investment decision-making and active ownership (Li *et al.*, 2021). Furthermore, companies must identify industry-specific risks, opportunities and issues related to the materials they use – the process of identifying and disclosing ESG factors that are significant for companies – in their business plans through the development of performance metrics (London Stock Exchange Group, 2018).

To address these demands, businesses are integrating ESG considerations into their strategic planning and investment decisions. RegTech solutions have the potential to facilitate this integration by automating ESG data collection, enabling materiality assessments and ensuring compliance with sustainability standards (Macchiavello and Siri, 2022). However, the adoption of sustainability practices in the financial industry has been criticized for its focus on short-term profits, lack of transparency in assessing social and environmental impacts and limited accountability (Kim, 2015). RegTech offers a pathway to address these criticisms by providing data-driven tools that enhance decision-making, improve governance processes and support responsible investment strategies.

### *2.3 Regulatory technology for sustainability compliance*

To explore RegTech's role in sustainability compliance, it is essential to first understand its potential capabilities and the broader context in which these technologies operate. RegTech has garnered attention as a transformative tool for addressing compliance challenges in highly regulated sectors. However, its application in the domain of sustainability compliance, particularly in supporting ESG objectives, remains an emerging area of inquiry.

RegTech's capabilities are built on its ability to leverage advancements in data analytics, AI, ML and cloud computing to automate, optimize and streamline compliance processes. These technologies enable organizations to navigate compliance demands by providing tools that collect, analyze and report compliance-related data with speed and accuracy (Bolton and Mintrom, 2023). When applied to sustainability compliance, these capabilities hold promise for addressing real-time monitoring of ESG risks, ensuring transparency in reporting and supporting responsible investment strategies.

Existing literature has largely focused on RegTech's application in traditional compliance areas, such as AML and fraud detection, where it has demonstrated substantial operational benefits (Arner *et al.*, 2018; Kristanto and Arman, 2022). In contrast, its potential to address the distinct demands of sustainability compliance is less understood. Sustainability compliance introduces unique complexities, including the integration of ESG factors into corporate strategies, meeting disclosure requirements under regulations such as the CSRD, and identifying materiality factors relevant to specific industries (European Commission, 2018; London Stock Exchange Group, 2018).

The foundational studies in the field of compliance and RegTech, such as those by Kristanto and Arman (2022), Cai *et al.* (2022) and Grassi and Lanfranchi (2022), emphasize RegTech's ability to enhance monitoring, compliance, reporting and risk management capabilities. However, they fall short of addressing how these capabilities translate to the

ESG context. For instance, while [Kristanto and Arman \(2022\)](#) defined seven core pillars of RegTech – monitoring, compliance, reporting, risk management, information gathering, data mining and data sharing – there is no discussion on how these pillars can be adapted to support sustainability objectives.

To address these gaps, this review adopts a multivocal approach, integrating insights from both academic and gray literature to examine how RegTech can address the specific demands of sustainability compliance. By systematically analyzing the capabilities that RegTech solutions provide and assessing how they align with ESG frameworks and regulatory requirements, this study establishes a structured foundation for evaluating their effectiveness. This review sets the stage for an investigation into RegTech's transformative potential in sustainability compliance and the structural barriers that must be addressed for its broader adoption.

#### 2.4 Information systems capability framework

To explore what capabilities RegTech solutions offer to assist financial institutions and corporations in their compliance effort with sustainability regulations, this study applies the ISC framework by [Feeny and Willcocks \(1998\)](#), which is grounded in the resource-based view of the firm ([Wernerfelt, 1984](#); [Teece, Pisano, and Shuen, 1997](#)). The ISC framework illustrates ways in which organizations leverage technological, human and collaboration capabilities to generate value in complex and compliance-driven environments. While early work conceptualized IS capabilities as foundational enablers of business performance ([Feeny and Willcocks, 1998](#)), more recent studies have highlighted their role in enhancing decision-making, business process execution and organizational adaptability ([Karimi et al., 2007](#); [Aydiner et al., 2019](#); [Al-Matari et al., 2022](#)).

The ISC framework has been previously used to study other emerging technologies, including cloud computing ([Garrison et al., 2015](#)) and data-driven compliance systems ([Khin and Ho, 2019](#)). In the domain of sustainability compliance, where organizations must align regulatory, technical and organizational resources, the ISC framework provides a structured lens for identifying RegTech-related capabilities. These include adaptive competencies ([Karimi and Walter, 2015](#)), AI-enabled practices including data governance and collaborative development ([Weber et al., 2023](#); [Wamba et al., 2017](#)) and analytics-oriented capabilities encompassing infrastructure, expertise and cross-functional coordination ([Shuradze and Wagner, 2016](#); [Rai and Tang, 2014](#)).

### 3. Methodology

#### 3.1 Multivocal literature review

This study employs a MLR to synthesize insights from academic literature and gray literature ([Garousi et al., 2019](#); [Adams et al., 2017](#)). Unlike systematic literature reviews ([Tranfield et al., 2003](#)), which focus on peer-reviewed research, an MLR also integrates nontraditional sources, such as industry reports, regulatory guidelines and practitioner insights, to capture a broader perspective on RegTech and sustainability compliance ([Coppola and Ardito, 2021](#); [Garousi et al., 2019](#)). Given that RegTech is an emerging field, where much of the practical development and discussions about RegTech and compliance technologies occur outside academia, an MLR approach ensures a more comprehensive analysis. Following [Garousi et al. \(2019\)](#), the MLR was conducted in three phases:

- (1) Planning – Defining research questions and developing a search strategy.
- (2) Conducting – Collecting, filtering and analyzing relevant literature.
- (3) Reporting – Synthesizing findings and discussing implications.

To ensure rigor, we applied additional guidelines for evaluating gray literature quality and relevance (Adams *et al.*, 2017).

### 3.2 Objectives and research questions

This research analyzes the body of knowledge on RegTech, focusing on its role in enhancing sustainability compliance, specifically for corporations and financial institutions. This objective was translated into two research questions:

- RQ1. What is the current state of research on RegTech in enhancing sustainability compliance, what research methods have been employed, and what aspects have been explored? and
- RQ2. What capabilities does RegTech offer, and how do they contribute to sustainability compliance demands?

### 3.3 Search, screening and selection of articles for review

Since academic research on RegTech is still limited, and practical applications are discussed extensively in gray literature, different search strategies were required for each source type.

**3.3.1 Academic literature.** We searched bibliographic databases Web of Science (WOS) and Scopus to find the optimum search strategy. The initial search string was “Regulatory Technology” OR RegTech AND sustainability, which returned 88 articles. There was a concern that incorporating the term sustainability in the search might restrict the search and potentially miss relevant studies. Many articles might investigate sustainability-related topics without explicitly featuring the term in their titles. We modified and complemented the search string by removing sustainability from the search string to access a broader set of articles. The search string “Regulatory Technology” OR RegTech is designed to capture all academic studies on RegTech and related compliance technologies before narrowing down to sustainability compliance.

Two academic databases, Web of Science (WOS) and Scopus, were used to perform the keyword search “Regulatory Technology” OR RegTech because these databases provide comprehensive coverage of studies within the discipline and offer different searching and filtering alternatives (Okwir *et al.*, 2018). The review included studies published between 2014 (the first appearance of keywords in the literature based on a search in Scopus and WOS) and September 2023. At this stage, we retrieved 250 articles: 144 articles from Scopus and 106 from WOS.

As RegTech is a new and emerging term, we also searched terms close to “Regulatory Technology,” such as “Compliance Technology,” “Risk Management Technology” and “Regulatory Intelligence,” to see if there was more literature regarding the role of IT-based solutions in promoting compliance with sustainability regulations. Among these search strings, we found that “Regulatory Intelligence” was the closest and most relevant term to regulatory technology. As a result, we retrieved 68 articles: 16 articles from WOS and 52 from Scopus for “Regulatory Intelligence.” Overall, we retrieved 318 articles using two search strings.

To refine the selection, a systematic screening process was conducted. First, all non-peer-reviewed studies, such as topic introductions and calls for papers, were identified and removed, reducing the data set to 220 primary studies. Second, a title-based screening was applied using predefined exclusion criteria, removing 131 studies that did not explicitly address regulatory technology, regulatory compliance or sustainability-related regulations, and reducing the data set to 89 studies.



Next, to ensure the reliability and validity of the selected studies, we applied a structured data extraction process using a predefined data extraction form (Table 1) based on established methodologies (Tranfield *et al.*, 2003).

Each primary study was assessed according to seven data properties (DP1–7), covering publication details, methodological rigor and sustainability relevance. The extraction process combined automated retrieval of generic data properties (e.g. publication year, channel, contribution type) with a manual analysis of research methods, quality assessment and sustainability focus. To enhance validity and completeness, we conducted descriptive statistical analysis to evaluate publication trends and applied keywording techniques (Petersen *et al.*, 2008) to classify research themes.

A rigorous quality assessment (Garousi *et al.*, 2019; Xiao and Watson, 2019) was also performed to ensure that selected studies met high methodological standards, were published in reputable academic journals and were directly relevant to our research questions (Palmatier *et al.*, 2018). This extraction process resulted in the exclusion of 37 articles. The remaining 52 studies were selected for full-text review. After a detailed full-text analysis, 22 articles met the study's scope and inclusion criteria. A backward and forward citation search (Webster and Watson, 2002) was conducted to identify additional relevant studies, leading to the inclusion of 7 more studies, bringing the final total to 29 primary academic studies, which form the basis of our review (see Appendix).

**3.3.2 Gray literature.** The exact search string “Regulatory Technology” OR RegTech was applied to the Google search engine, which is the largest repository to identify relevant gray literature on our topic (Garousi *et al.*, 2019). This led to 5,020,000 results. We noticed that the search string was too broad and returned a lengthy list of materials irrelevant to our topic. We added “sustainability” to the search string to refine the search and used (“Regulatory Technology” OR RegTech) AND sustainability search string. The results of our search totaled 497,000. We limited our search to the first 15 pages of Google search results, as we found that the studies and reports beyond the 15th page were irrelevant to our research. No articles beyond the 15th page related to RegTech and compliance with sustainability could be identified. As a result, 164 records were collected from the first 15 Google pages.

The relevance of the gray literature was determined using the inclusion criteria provided by (Adams *et al.*, 2017; Garousi *et al.*, 2019). Based on these criteria, the identified document should be assigned to the first tier of gray literature, the full text should be available and the authors should explore the concepts of RegTech and sustainability compliance. Overall, we found 164 documents on RegTech and sustainability. Subsequently, 99 documents, blog posts, presentations and news websites were excluded from our analysis.

**Table 1.** Data properties

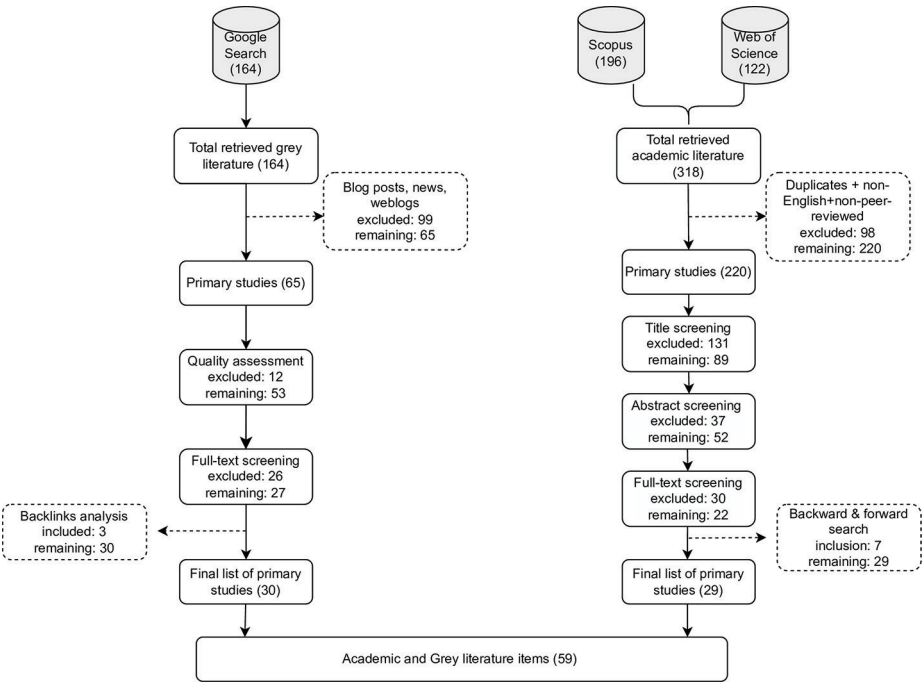
ID	Title	Cardinality	RQ
DP1	Publication year	1:1	RQ1
DP2	Publication channel	1:1	RQ1
DP3	Contribution type	1: *	RQ1
DP4	Scientific publishing domain	1:1	RQ1
DP5	Research method	1:1	RQ1
DP6	Primary study quality assessment	1:1	RQ1
DP7	RegTechs for sustainability compliance	1: *	RQ2

**Source(s):** Authors' own creation

Next, a quality assessment process led to the exclusion of an additional 12 documents from the remaining pool of 65 documents. For the quality assessment, we used the authority, accuracy, coverage, objectivity, date and significance checklist presented by [Tyndall \(2010\)](#). This checklist consists of six dimensions with 13 questions that assess the authority of the producer, the accuracy of the study, the scope and the date and significance. Following this full-text screening process, we removed 27 documents. The review of literature citations and backlinks analysis led us to add three gray literature works, which were relevant to the topic, to our analysis. At the end of this iterative process, we included 30 gray literature documents for a comprehensive review and analysis of the impact of RegTech on sustainability compliance in corporations and financial institutions (see [Appendix](#)). The process of search, screening and selection process for both academic and gray literature is outlined in [Figure 1](#).

4. Bibliographical analysis

This section examines the evolution of RegTech for sustainability compliance through a bibliographical analysis of academic and gray literature. We first assess publication trends and authorship to understand where and how research is emerging, identifying key disciplines and the extent of academic-industry collaboration. Next, we analyze domain-specific applications, categorizing studies across finance, law, sustainability, environmental regulation and IS to compare how different fields conceptualize RegTech’s role. Finally, we



**Figure 1.** An overview of the search, screening and selection process for academic and gray literature  
**Source:** Authors’ own creation



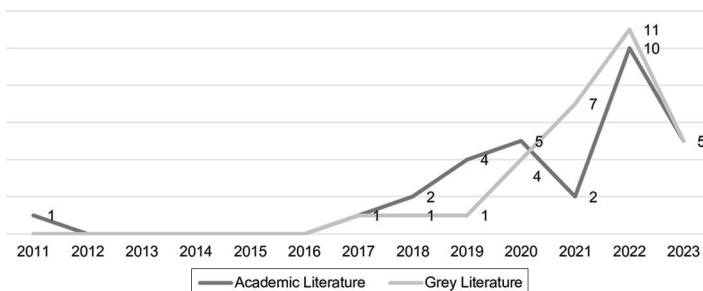
evaluate research methods and quality, assessing the rigor of academic studies and the credibility of gray literature.

#### 4.1 Evolution of the knowledge domain – regulatory technology for sustainability compliance

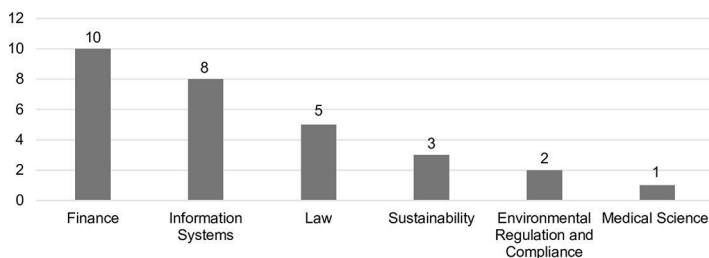
The intersection of RegTech and sustainability compliance has gained popularity in research and practice in recent years. The first article discussing RegTech in an academic journal appeared in 2018 (Zetsche and Dewi, 2018). However, as early as 2011, Butler addressed the role of IT-based solutions and green IS in enhancing environmental compliance management and processes (Butler, 2011). The first gray literature study was published in 2017, a collaboration between the University of Zurich and the University of Cambridge, a study about financial inclusion, FinTech and RegTech.

The year published and the number of studies that qualified to be included in the MLR are shown in Figure 2. While this data set does not aim to provide a comprehensive trend analysis, it illustrates the growing academic and industry interest in RegTech's role in sustainability compliance. The number of included publications increased significantly after 2018, peaking in 2022, with a mix of academic studies and industry reports. This reflects an emerging research field, where industry-driven studies have been particularly active in shaping the discourse, while academic research has been gradually developing its theoretical and empirical foundations.

A closer examination of the academic contributions included in this MLR reveals the disciplinary landscape of research on RegTech for sustainability compliance. The contributions come from finance (10 studies), IS (eight studies), law (five studies) and sustainability (three studies) (Figure 3). An authorship analysis indicates that 25 academic papers were authored



**Figure 2.** Publication year distribution of selected academic and gray literature in this review  
**Source:** Authors' own creation



**Figure 3.** Academic publishing domain  
**Source:** Authors' own creation

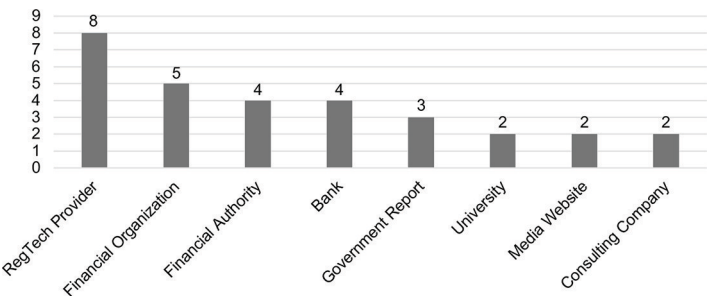
exclusively by academic scholars, while four studies resulted from collaborations between academics and industry practitioners, highlighting some but not extensive collaboration between researchers and practitioners.

The gray literature we incorporated in the MLR includes contributions from RegTech providers (eight), financial organizations (five), banks (four) and financial authorities (four) (Figure 4). The active involvement of industry players in producing studies suggests that RegTech solutions are actively being developed and applied to address sustainability compliance needs and challenges.

4.2 Analysis of research domains

We next analyzed the disciplinary focus, thematic scope and target audience of published research. Our review identified five key disciplinary domains contributing to this field: finance, law, sustainability, environmental regulation and compliance and IS. Below, we summarize the primary themes explored within each discipline.

*Finance.* Studies in finance have investigated RegTech’s role in financial inclusion, digital and green finance, regulatory compliance and IT-based solutions for sustainability compliance (Table 2). Research highlights that RegTech facilitates financial inclusion



**Figure 4.** Distribution of publication outlets of gray literature  
**Source:** Authors’ own creation

**Table 2.** Academic papers in the domain of finance addressing RegTech’s role in sustainability compliance

Topic	Role in sustainability compliance	References
Financial inclusion	Providing technology-based solutions for promoting financial inclusion, supporting SDGs and crisis resilience	A4; A20
Regulatory compliance	RegTech acts as an assistant for addressing risks and navigating regulatory demands	A15; A27
Digital and green finance	It offers technology-based solutions to promote sustainable digital finance and solutions for integrating complex data for sustainability practices	A3; A6; A8; A23
IT-based solutions for sustainability practices	Offers IT-based solutions for digitalizing the financial industry and reducing compliance costs	A7; A21

**Source(s):** Authors’ own creation

by offering technology-based solutions that are aligned with the United Nations SDGs (Arner *et al.*, 2020). RegTech also enhances regulatory compliance by streamlining risk management and reporting processes (Clapham *et al.*, 2022) and reduces compliance costs while integrating ESG considerations into financial decision-making (Miguel and Algarvio, 2019).

*Law.* Within the domain of law, scholars have examined RegTech's impact on risk management, regulatory governance and financial inclusion (Table 3). Studies suggest that RegTech strengthens compliance by leveraging digital financial infrastructure for monitoring and reporting (Arner *et al.*, 2020). In addition, it supports financial inclusion by improving governance mechanisms and enabling credit register supervision (Zetzsche *et al.*, 2023).

*Sustainability.* Research in this area investigates how RegTech enhances sustainability compliance through microfinance, crowdfunding and improved transparency of financial products (Table 4). Scholars emphasize the role of RegTech in facilitating digital transformation in finance, promoting user-friendly and efficient financial products and fostering technology-driven solutions for environmental and social sustainability (Rambaud and Gázquez, 2022; Zeranski and Sancak, 2020).

*Environmental regulation and compliance.* The literature on environmental regulation has focused on how IT-based solutions enhance the effectiveness of regulatory measures such as greenhouse gas reduction schemes (Table 5). Studies indicate that RegTech has a positive impact on regulatory compliance by improving the accuracy and efficiency of environmental reporting (Amesheva, 2019; Deatherage, 2021).

*IS.* Research in IS highlights RegTech as an IT-based solution that enhances compliance processes, risk management and corporate sustainability initiatives (Butler *et al.*, 2023;

**Table 3.** Academic papers in the domain of law addressing RegTech's role in sustainability compliance

Topic	Role in sustainability compliance	References
Risk management, reporting, monitoring	RegTech facilitates digital financial infrastructure, monitoring, and reporting to enhance sustainability practices	A5
Financial inclusion and digital finance	RegTech enhances financial inclusion and assists in establishing, governance and supervising credit registers	A5; A18; A26; A28; A29

**Source(s):** Authors' own creation

**Table 4.** Academic papers in the domain of sustainability addressing RegTech's role in sustainability compliance

Topic	Role in sustainability compliance	References
RegTech for sustainability	RegTech promotes sustainable finance through microfinance and crowdfunding	A19; A24
Efficiency and transparency of the financial products	Promotes user-friendly, efficient and transparent financial products and enhances the impact of technology-based solutions on social and financial systems	A19; A22
Digitalization of the financial industry	Emphasizing the adoption of innovative technologies to provide financial products and services	A19; A22

**Source(s):** Authors' own creation

**Table 5.** Academic papers in the domain of environmental regulation and compliance addressing RegTech’s role in sustainability compliance

Topic	Role in sustainability compliance	References
Environmental regulatory measures	Promotes the effectiveness of environmental regulatory measures and reducing greenhouse gas emissions	A8
Regulatory compliance	The use of RegTech has a positive impact on the effectiveness of environmental compliance	A17

**Source(s):** Authors’ own creation

Butler and O’Brien, 2019). Scholars have explored the role of digital platforms in enabling sustainable business practices (Clarke, 2020) and the effectiveness of Green IS in environmental compliance (Akhigbe *et al.*, 2022; Butler, 2011; Butler and Hackney, 2021; Butler *et al.*, 2023) (see Table 6).

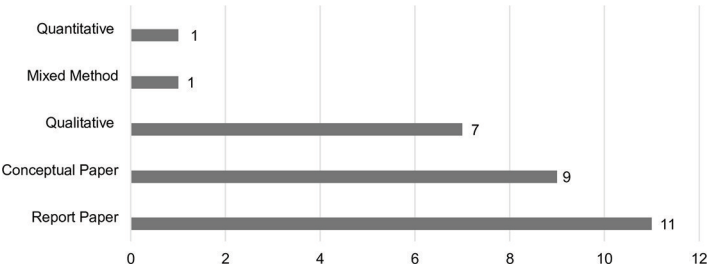
4.3 Research methods used in the academic literature

A methodological assessment of the academic literature reveals a predominance of conceptual and qualitative research, with fewer quantitative studies. Based on Leavy’s (2022) categorization, the reviewed studies employed three dominant research approaches: report papers (11 studies), conceptual papers (nine studies) and qualitative analyses (seven studies). In addition, one study utilized mixed-methods, and another adopted a quantitative approach (Figure 5).

**Table 6.** Academic papers in the domain of information systems addressing RegTech’s role in sustainability compliance

Topic	Role in sustainability compliance	References
Monitoring, transparency	RegTech enhances monitoring, transparency and accountability, fostering sustainable business practices	A16
IT-based solutions and green IS for compliance	RegTech offers data-driven compliance solutions and improves compliance approaches	A1; A2; A11; A12; A13; A18

**Source(s):** Authors’ own creation



**Figure 5.** Research methods used in the academic literature  
**Source:** Authors’ own creation

#### 4.4 Quality analysis

To assess the quality of academic literature, we examined publication sources, methodological rigor and alignment with research questions. Using the Academic Journal Guide (ABS) list ranking, a widely used journal ranking for assessing articles' quality, we found that 11 of the 29 analyzed studies were published in high-quality or top-tier journals, six appeared in mid-tier journals and 12 were published in lower-ranked outlets. This distribution indicates a mix of established and emerging research contributions to the field.

The quality of the gray literature was assessed using a checklist presented by [Garousi et al. \(2019\)](#). This checklist consists of eight dimensions with 20 questions that assess, for example, the authority of the producer, methodology, objectivity, novelty and impact. Reputable organizations published all 30 articles in the gray literature. All 30 gray literature documents were published by reputable organizations, demonstrating clear objectives and supporting evidence. However, some sources exhibited lower influence based on backlinks and social media engagement, highlighting variations in the impact of industry-generated knowledge on RegTech and sustainability compliance.

### 5. Regulatory technology capabilities and their role in meeting sustainability compliance

Our specific focus in this MLR was on investigating the current understanding of and knowledge about the capabilities RegTech offers and how it contributes to sustainability compliance in corporations and financial institutions.

Through a structured analysis of both academic and gray literature, we identified five core capabilities:

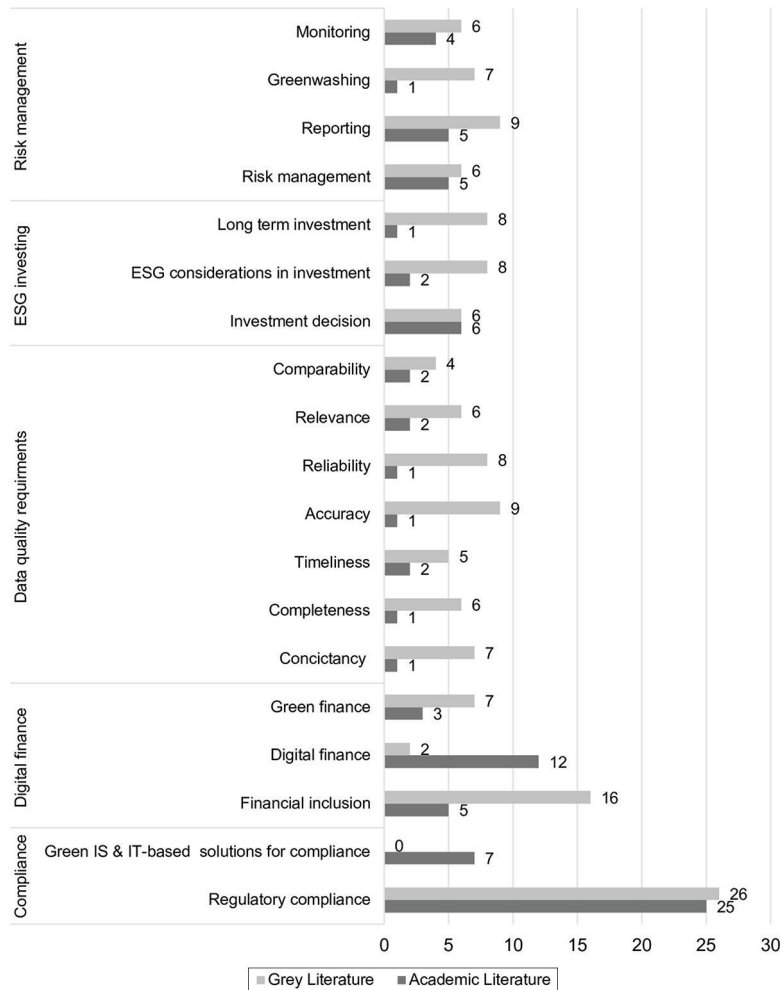
- (1) sustainability compliance;
- (2) ESG risk management;
- (3) ESG investing,
- (4) digital finance; and
- (5) ESG data requirements for compliance (see [Figure 6](#)).

These five core capabilities were derived by examining the role of RegTech in compliance processes and regulatory adherence, its impact on financial decision-making and its function in improving the quality and accessibility of sustainability-related data. We analyze each of these capabilities through the ISC framework lens, exposing how technological, human and collaborative capabilities underpin RegTech's contribution to ESG and sustainability compliance.

#### 5.1 Regulatory technology capabilities for sustainability compliance

RegTech plays a crucial role in ensuring compliance across industries, particularly in the financial sector. Compliance process improvement was a central theme in 26 gray literature articles and 25 academic studies. RegTech solutions offer several benefits:

- maintaining the integrity of sustainability processes;
- reducing compliance costs;
- automating compliance procedures; and
- mitigating sustainability risks (see [Table 7](#)).



**Figure 6.** Distribution of academic and gray literature across core capabilities enabled by RegTech for sustainability compliance  
**Source:** Authors' own creation

RegTech preserves the integrity of compliance processes by analyzing vast amounts of data and automating the monitoring process (Amesheva, 2019; Deloitte, 2023; Zeranski and Sancak, 2020). It improves the transparency of sustainability processes by providing real-time data on sustainability practices, helping companies identify and mitigate risks, improve the process and cut compliance costs (Bank of England, 2019; Barefoot, 2020; Colquhoun, 2022; Deloitte, 2023; Hong Kong Monetary Authority, 2020; Macchiavello and Siri, 2022; World Bank, 2021).

Cost management is essential for organizations to maintain profitability. Analog systems are challenging and expensive for regulatory compliance and risk identification (Deatherage, 2021).

**Table 7.** Summary of studies on how RegTech supports sustainability compliance and challenges with these solutions

RegTech for compliance	RegTech roles	Academic and gray literature addressing the issue
Compliance capabilities	Preserve the integrity of the sustainability process, address risks and enhance sustainability practices, automate the process of compliance, reduce costs of compliance, enable knowledge sharing and decision making	In total 51 studies: A1; A2; A3; A6; A7; A8; A9; A10; A11; A12; A13; A14; A15; A16; A17; A18; A19; A20; A21; A23; A24; A25; A27; A28; A29; G1; G3; G4; G5; G6; G7; G8; G9; G10; G12; G13; G14; G15; G16; G18; G19; G21; G22; G23; G24; G25; G26; G27; G28; G29; G30
IT-based solutions, green IS	Manage environmental compliance by enabling knowledge-sharing	In total six studies: A1; A2; A11; A12; A13; A14
Challenges	Initial implementation costs of RegTech and lack of maturity	In total seven studies: A4; A10; G8; G16; G27; G28; G29

**Source(s):** Authors' own creation

RegTech can reduce the cost of regulatory compliance with digital-based technologies that reduce manual processes and enable continuous updates of regulatory requirements (Arner *et al.*, 2018; Barefoot, 2020; Bergmann, 2022; Bolton and Mintrom, 2023; Butler *et al.*, 2023; Butler and O'Brien, 2019; Miguel and Algarvio, 2019; Rambaud and Gázquez, 2022). RegTech solutions automate the process of compliance and reporting through various technologies such as blockchain, data analytics and cloud computing to provide transparent and accurate records of transactions, ensure data integrity and identify potential compliance issues (Amesheva, 2019; Clapham *et al.*, 2022; Clarke, 2020; Deatherage, 2021).

While RegTech offers beneficial solutions for regulatory compliance, it can also present challenges such as initial implementation costs, lack of maturity of the solutions and data and analytic challenges (Arner *et al.*, 2020). The use of RegTech solutions can lead to cost savings in the long term, but implementing these solutions can be costly for small and medium-sized companies (Australian Government Productivity Commission, 2020). Furthermore, the lack of maturity and availability of solutions can hinder the customization of RegTech for sustainability activities (Barefoot, 2020; Bolton and Mintrom, 2023; Hong Kong Monetary Authority, 2020).

### 5.2 Regulatory technology capabilities for environmental, social and governance risk management

RegTech contributes to ESG risk management by improving risk identification, facilitating scenario analysis and enhancing impact measurement. The literature review highlights 11 studies on risk mitigation, 16 on risk reporting, 11 on risk monitoring and nine on combating greenwashing (see Table 8).

Companies can benefit from RegTech solutions to improve their data collection, analysis and distribution for more informed decision-making and to identify risks for exposed cases (Arner *et al.*, 2020; Butler *et al.*, 2023; Irving Fisher Committee on Central Bank Statistics, 2021; Zeranski and Sancak, 2020). RegTech can be used for scenario analysis, simulations and stress testing, and through these provide risk management and compliance capabilities (Hong Kong Monetary Authority, 2020).



**Table 8.** Summary of studies on risk management capabilities offered by RegTech

RegTech capability	RegTech role	Academic and gray literature addressing the issue
Risk management	Provide advanced data technologies for the identification and mitigation of risks	In total 11 studies: A4; A12; A22; A23; A28; G1; G10; G14; G16; G19; G20
Risk reporting	Automate reporting processes. Enhance the process of information communication about the potential risks	In total 16 studies: A1; A2; A14; A21; A22; A23; A28; G2; G6; G7; G12; G15; G19; G20; G24; G25
Risk monitoring	An ongoing process of tracking, assessing, and managing potential risks associated with companies' ESG practices	In total 11 studies: A1; A4; A22; A23; A28; G6; G11; G19; G20; G23; G27;
Greenwashing	Provide advanced analytics and real-time monitoring to validate environmental data	In total nine studies: A23; G1; G4; G5; G9; G10; G14; G18; G19
<b>Source(s):</b> Authors' own creation		

RegTech provides a data-management system and regulatory reporting framework that combines an integrated data flow on a big data-driven platform, improving the reporting process and regulatory compliance (KPMG–UK, 2021). By automating the ESG reporting processes, RegTech solutions assist organizations in meeting their regulatory expectations in a timely and cost-effective manner (Butler and O'Brien, 2019; Miguel and Algarvio, 2019).

By providing risk management and compliance capabilities, RegTech covers ESG monitoring requirements. It can also provide efficient data gathering and processing capabilities and real-time alerts by leveraging algorithms and data analytics (Papenbrock *et al.*, 2022). RegTech is practical for impact measurement and monitoring, providing defined metrics and performance indicators (Moro-Visconti *et al.*, 2020). By monitoring transactions and tracking compliance with regulations, RegTech can support the monitoring of market behavior. Providing data analytics tools helps regulators monitor companies for environmental compliance and trucking companies for speeding violations (World Bank, 2021).

Providing advanced analytics and real-time monitoring can help validate environmental data and detect greenwashing (FinTech Association of Hong Kong, 2021). In addition, RegTech can tackle greenwashing by providing solutions that create transparent and immutable records of products' environmental performance (Barefoot, 2020).

While RegTech can be essential in combating greenwashing, it also poses challenges. Because RegTech solutions depend on the data quality, if the data used for reporting is inaccurate or incomplete, RegTech can provide misleading results and fail to detect greenwashing.

*5.3 Regulatory technology capabilities for environmental, social and governance investing*  
RegTech enhances ESG investing by optimizing financial resource allocation, supporting green investment strategies, providing clean data and detecting investment risks. Our analysis found 12 studies on ESG-driven investment decisions, 10 on ESG considerations and nine on long-term investments (see Table 9).

RegTech can help financial institutions allocate resources efficiently and integrate sustainability into investment portfolios (Arner *et al.*, 2020; Macchiavello and Siri, 2022). It enables financial institutions to access enriched and clean data for sustainable investments and to identify red flags in investment assets (Arner *et al.*, 2020; Deloitte, 2023; KPMG–UK, 2021). RegTech facilitates the tracking and verification of data generated by carbon-intensive companies. Furthermore, RegTech solutions can employ ML to monitor climate risks and environmental data to support the ESG investment process.

**Table 9.** Summary of studies on how RegTech supports ESG investing

ESG investment factors	RegTech roles	Academic and gray literature addressing the issue
Investment decisions	Allocation of existing financial resources to support sustainable development	In total 12 studies: A4; A7; A8; A17; A19; A20; G6; G10; G11; G13; G24; G26
ESG considerations in investment	Utilizes blockchain for land registration to reduce risks and provides official land registration in developing countries	In total 10 studies: A19; A20; G1; G4; G5; G10; G11; G13; G20; G24
Long-term investment	Facilitates long-term investments aimed at enhancing the sustainability of the real economy	In total nine studies: A19; G1; G4; G5; G10; G11; G13; G20; G24

**Source(s):** Authors' own creation

#### 5.4 Regulatory technology capabilities for digital finance

We identified 22 studies on financial inclusion, 15 on digital finance and 10 on green finance (see [Table 10](#)).

RegTech supports green finance by improving access to financial services, assessing credit risk and enhancing transparency in financial institutions ([Bank of England, 2019](#); [Irving Fisher Committee on Central Bank Statistics, 2021](#)). It facilitates financial inclusion, reduces transaction costs and enables remote monitoring of environmental impacts through real-time data and geographic IS ([Barefoot, 2020](#); [Arner \*et al.\*, 2018](#)).

However, the digitalization of finance through RegTech also presents risks, including IT system failures, security vulnerabilities, algorithmic bias and data reliability issues ([Zeranski and Sancak, 2020](#); [Swiss Federal Council, 2022](#)). Privacy concerns and regulatory compliance challenges remain critical, particularly regarding blockchain-based data confidentiality and the accuracy of ESG data ([Arner \*et al.\*, 2022a, 2022b](#)).

#### 5.5 Regulatory technology capabilities for environmental, social and governance data requirements for compliance

Ensuring high-quality ESG data is critical for sustainability compliance, as regulatory requirements increasingly demand transparency, accuracy and reliability in ESG reporting. To analyze the role of RegTech in addressing ESG data challenges, we mapped the relevant studies using the ISO 25012 data quality model ([Table 11](#)). This model provides a structured approach to categorizing ESG data issues based on key dimensions such as consistency, completeness, timeliness, accuracy, reliability, relevance and comparability. By applying this model, we highlight how RegTech solutions contribute to improving ESG data quality and the challenges that persist in ensuring data integrity.

RegTech enhances ESG data consistency by normalizing information across various sources, ensuring standardized reporting practices. It also improves completeness by capturing a comprehensive scope of ESG-related factors, which is crucial for assessing sustainability performance. In addition, RegTech solutions support real-time data collection, eliminating delays and enhancing timeliness in ESG reporting ([Arner \*et al.\*, 2020](#); [Australian Government Productivity Commission, 2020](#)).

Accuracy and reliability are two of the most frequently discussed ESG data concerns in both academic and gray literature. RegTech provides automated validation mechanisms to improve data governance, reducing errors in ESG disclosures. AI and ML-based solutions

**Table 10.** Summary of studies on how RegTech supports digital finance and its challenges

Digital finance	RegTech roles	Academic and gray literature addressing the issue
Digital finance	Enhances digital financial services by providing real-time data to map financial access	In total 14 studies: G11; G28; A3; A4; A5; A6; A7; A19; A20; A22; A24; A26; A27; A28
Green finance	Assists in offering green loans and providing sustainable investment funds	In total 10 studies: G1; G5; G9; G12; G14; G17; G22; A7; A20; A22
Financial inclusion	Improves access to financial services using alternative data. Supports financial inclusion for individuals and small and medium-sized enterprises	In total 22 studies: G5; G6; G7; G11; G13; G14; G15; G16; G18; G21; G22; G23; G24; G26; G28; G29; A2; A6; A7; A24; A20; A29
Challenges	Failures in IT systems, algorithmic bias, compliance challenges	In total seven studies: A27; A28; G13; G16; G18; G19; G29
<b>Source(s):</b> Authors' own creation		

**Table 11.** Summary of studies on RegTech applications related to data quality

Data quality	RegTech roles	Academic and gray literature addressing the issue
Consistency	Facilitates data normalization, ensuring that information is represented consistently across various sources	In total eight studies: A5; G1; G3; G4, G7; G8; G13; G24
Completeness	The data collected reasonably cover the full scope of the question they are intended to answer	In total seven studies: A5; G1; G2; G4; G8; G24; G30
Timeliness	Provides automated data collection, ensures information is captured in real time and eliminates delays	In total seven studies: A5; A17; G1; G4; G8; G27; G24
Accuracy	Provides data governance and accurate data through automated validation	In total 10 studies: A5; G1; G3; G4; G8; G7; G13; G18; G24; G30
Reliability	Allows massive quantities of ESG data to be processed with AI and ML	In total nine studies: A5; G1; G4; G8; G7; G13; G18; G24; G30
Relevance	Determines what ESG issues are significant for organization and material data	In total eight studies: A2; A5; G3; G4; G8; G18; G24; G30
Comparability	Enhances comparability by eliminating discrepancies arising from variations in data formats	In total six studies: A3; A5; G1; G7; G18; G24
<b>Source(s):</b> Authors' own creation		

allow financial institutions to process vast amounts of ESG data, ensuring the reliability of reported information (Deatherage, 2021; OECD-Asia, 2022). Moreover, RegTech facilitates the identification of material ESG factors, helping organizations prioritize relevant data for sustainability decision-making.

Another critical issue is comparability – ensuring that ESG data across different organizations and jurisdictions aligns with standardized formats. RegTech solutions help eliminate discrepancies in data representation, making ESG reporting more transparent and accessible for regulators and stakeholders (Akhigbe et al., 2022).

Despite these advantages, challenges remain in fully leveraging RegTech for ESG data quality. Issues such as data fragmentation, the lack of unified reporting standards and concerns over data privacy hinder its effectiveness. Ensuring the widespread adoption of RegTech in ESG compliance will require further collaboration between regulators, financial institutions and technology providers to establish common frameworks and enhance interoperability.

## 6. Discussion

This MLR has systematically examined the existing body of academic research and gray literature on RegTechs and the IS capabilities these technologies enable, the challenges and the limitations they currently have in supporting sustainability compliance in corporations and financial institutions. Compliance capabilities in sustainability refer to an organization's ability to integrate regulatory requirements into its operations, ensuring adherence to evolving sustainability regulations through governance, data management and risk assessment mechanisms. RegTech solutions enable compliance capabilities for sustainability compliance by leveraging advanced digital solutions to enhance efficiency, accuracy and adaptability in regulatory adherence. These capabilities encompass real-time monitoring, reporting, ESG data governance, transparency, regulatory foresight and the ability to mitigate compliance risks such as greenwashing and regulatory misalignment. As this review shows, effective sustainability compliance relies not only on firm-level capabilities but also on broader infrastructures and frameworks, including robust data infrastructures, cross-sector regulatory harmonization and alignment with global standards such as the CSRD and SFDR.

### 6.1 Regulatory technology's contributions to sustainability compliance

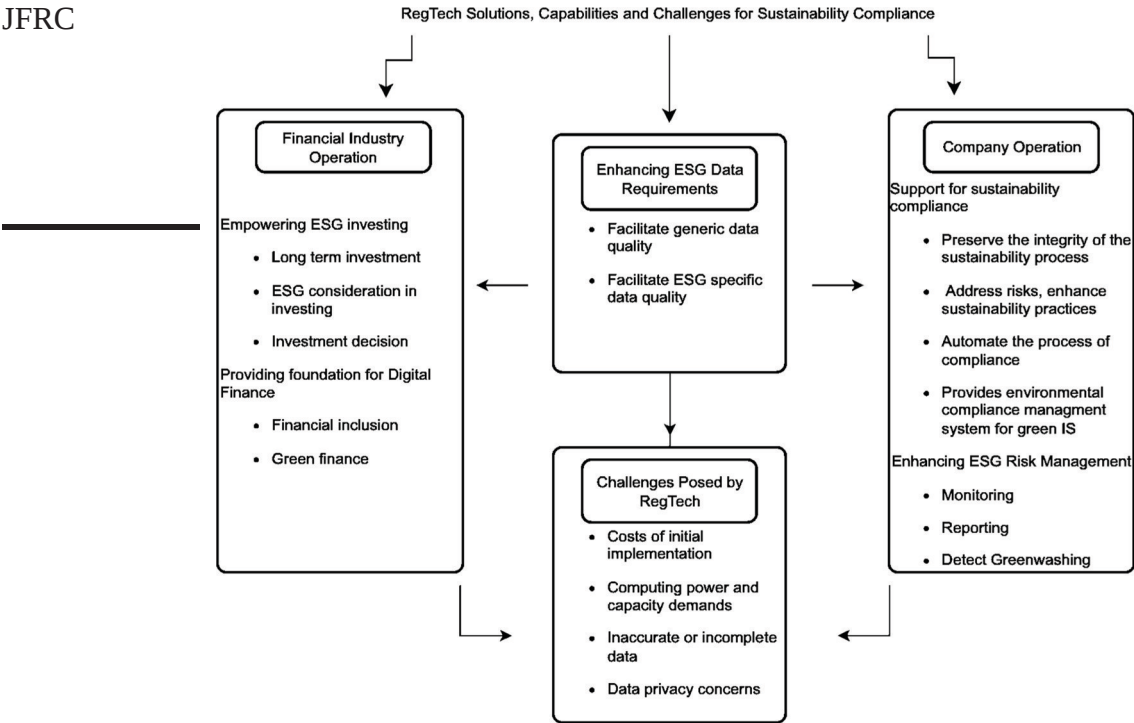
Our findings demonstrate that RegTech enhances compliance capabilities by facilitating real-time compliance monitoring, automated data validation and structured ESG risk assessment. A key advantage of RegTech is its ability to automate compliance processes, reducing both costs and human error while ensuring real-time monitoring and reporting (Deatherage, 2021). Advanced solutions in data analytics, ML and blockchain promise to enhance regulatory oversight, risk mitigation and sustainability disclosure (Macchiavello and Siri, 2022; Zetzsche and Dewi, 2018).

Figure 7 illustrates RegTech's key capabilities and challenges for sustainability compliance, showing how it strengthens compliance processes in both financial institutions and corporate sustainability governance while also highlighting implementation challenges such as costs, data quality concerns and computational demands.

Our review exposes that RegTech offers distinct yet complementary capabilities for both financial industry operations and corporate sustainability compliance. In financial operations, RegTech plays a crucial role in empowering ESG investing by facilitating long-term investment strategies, integrating ESG considerations into financial decision-making and enhancing transparency in investment portfolios (Papenbrock *et al.*, 2022). In addition, RegTech provides a foundation for digital finance, improving financial inclusion and supporting green finance mechanisms (Arner *et al.*, 2020).

For corporations, RegTech solutions support sustainability compliance by preserving the integrity of sustainability processes, automating compliance tasks and enabling environmental compliance management systems for green IS. This includes monitoring, reporting and greenwashing detection capabilities, which help corporations maintain ESG transparency and regulatory alignment.

A particularly critical role of RegTech is in ensuring regulatory compliance across diverse jurisdictions. Multinational corporations operate in fragmented regulatory environments where sustainability reporting, risk mitigation and data-sharing obligations vary significantly



**Figure 7.** RegTech’s capabilities and challenges in sustainability compliance  
**Source:** Authors’ own creation

(OECD, 2022; Zetzsche *et al.*, 2018). By leveraging AI, blockchain and big data analytics, RegTech helps firms harmonize compliance strategies across multiple jurisdictions, ensuring consistency in ESG disclosures and regulatory filings (Papenbrock *et al.*, 2022). Also, the ESG data governance capabilities offered by RegTech ensure the integrity, reliability and comparability of sustainability disclosures, which are becoming increasingly critical under evolving regulatory frameworks such as CSRD and SFDR.

However, our review also identifies several systemic challenges that limit the impact and scalability of RegTech. These include high initial implementation costs, the need for extensive computational power, regulatory fragmentation and ongoing concerns regarding data privacy and AI-driven decision biases. These challenges necessitate coordinated investments in robust digital compliance infrastructures and interoperable ESG data governance frameworks to ensure the accuracy, consistency and transparency of sustainability-related disclosures (Deloitte, 2023; Macchiavello and Siri, 2022).

In that regard, the effectiveness of RegTech solutions is not solely dependent on an organization’s internal technological infrastructure but also on the broader compliance ecosystem, including regulatory harmonization, data-sharing mechanisms and cross-sector interoperability frameworks that affect compliance effectiveness (Grassi and Lanfranchi, 2022). These infrastructures include standardized ESG taxonomies, secure digital identity frameworks and cross-border data governance mechanisms, which enable the interchange of data between companies, consumers, regulators, auditors and supervisory authorities (Papenbrock *et al.*, 2022).

Without robust data infrastructures, the ability of RegTech solutions to automate compliance, ensure transparency and support sustainable investment is fundamentally constrained (Bolton and Mintrom, 2023).

More broadly, this review contributes to the field of ISC by extending the application of the ISC framework (Feeny and Willcocks, 1998) to the domain of sustainability-related compliance capabilities. Our MLR reveals how RegTech enables and integrates digital and data infrastructures, human expertise and relationship capabilities to support strategic and operational responses to sustainability compliance demands. Compliance capabilities are not merely internal control mechanisms but strategic organizational responses to external regulatory and operational demands for sustainability, such as ESG disclosure requirements, jurisdictional mandates like CSRD and SFDR, and stakeholder pressure for transparency. In this context, RegTech functions as a key enabler, allowing firms to sense, interpret and respond to these demands.

### 6.2 Implications for industry and policy

For industry, the integration of RegTech solutions presents a significant opportunity to improve sustainability compliance while reducing regulatory burden. From an IS perspective, developing a robust internal IS capability is essential for organizations to manage compliance efforts. This includes technical infrastructure such as data architecture, integration and organizational capability in data analytics and governance. Financial institutions, corporations and technology providers should prioritize investments in scalable and interoperable RegTech solutions that align with emerging regulatory and sustainability reporting standards such as the CSRD, SFDR and global ESG disclosure standards. The effectiveness of RegTech in enabling compliance automation, auditability and risk mitigation depends not only on firm-level adoption but also on the broader information and data infrastructures that support regulatory data exchange, ensuring consistency and accuracy across jurisdictions. Industry-wide collaboration is essential to establish shared data governance mechanisms, harmonized ESG taxonomies and interoperable digital reporting systems that enhance transparency and comparability of sustainability compliance efforts.

For policymakers, ensuring the effectiveness of RegTech in sustainability compliance requires regulatory harmonization, strengthened data governance frameworks and investments in cross-sectoral compliance infrastructures. Standardizing ESG disclosure requirements across jurisdictions can significantly reduce compliance fragmentation, enabling organizations to implement more consistent and scalable compliance strategies. Furthermore, regulatory bodies should support the development of interoperable digital identity frameworks, standardized ESG data repositories and cross-border compliance infrastructures that enhance the reliability and security of sustainability reporting. Governments could also consider incentives and funding mechanisms to facilitate the adoption of RegTech solutions, particularly for small and medium-sized enterprises (SMEs) and resource-constrained organizations, which may lack the financial capacity to implement advanced compliance tools. Public-private partnerships will be crucial in fostering the development of secure, AI-driven and blockchain-enabled regulatory data infrastructures that ensure transparent, verifiable and accountable sustainability governance at a systemic level.

### 6.3 Limitations and gaps in the literature

Most empirical insights into RegTech applications come from industry reports, rather than academic studies, highlighting a disconnect between academic research and industry practice. RegTech providers, financial organizations and regulatory authorities generate the majority of white papers and policy reports. While practitioner contributions provide valuable real-world

perspectives, they often lack systematic empirical validation, theoretical grounding and critical scrutiny. Furthermore, academic research on RegTech and sustainability compliance is scattered across multiple disciplines, including finance, law, IS and sustainability studies, leading to a lack of cohesion and standardized frameworks. Without harmonized definitions, classification schemes and measurement methodologies, interdisciplinary knowledge exchange remains limited, hindering the development of a structured body of knowledge (Butler and O'Brien, 2019; Silverberg *et al.*, 2016). Establishing consistent terminology and conceptual clarity is imperative to enhance cross-disciplinary collaboration and advance a cumulative research agenda.

#### 6.4 Challenges and future research directions

Despite the clear benefits of RegTech, several challenges remain that require deeper investigation. The initial implementation costs remain high, particularly for SMEs, which often lack the financial and technical resources to integrate advanced RegTech solutions (Johansson *et al.*, 2019). In addition, data privacy concerns, particularly about blockchain-based technologies, pose complex regulatory and ethical questions regarding data sovereignty, ownership and security (Deloitte, 2023).

RegTech also demands significant computational power, raising concerns about energy consumption and environmental sustainability, particularly as AI and ML models become more resource-intensive. Future research should explore how green computing and energy-efficient AI architectures can mitigate RegTech's sustainability footprint while maintaining compliance capabilities.

Another pressing issue is the accuracy and reliability of ESG data. Since RegTech relies on data-driven decision-making, any inaccuracies, biases or inconsistencies in the underlying data can lead to misleading compliance reports and investment decisions (Papenbrock *et al.*, 2022). Algorithmic bias, vague AI models and governance challenges further complicate the adoption of AI-driven compliance solutions (OECD, 2022). Future research should investigate strategies for improving data governance, transparency and explainability in RegTech applications, ensuring that compliance mechanisms are equitable, unbiased and aligned with sustainability objectives (Xiao and Watson, 2019).

In addition, future research could adopt complementary theoretical lenses – such as complexity theory, legitimacy theory or stakeholder theory – to deepen understanding of how RegTech interacts with multiactor compliance ecosystems. These frameworks may reveal how stakeholder dynamics, institutional pressures and technological complexity shape the evolution of RegTech capabilities across sectors.

To fully harness RegTech's potential, interdisciplinary collaboration is crucial. Researchers in sustainability, finance, law, management and IS should work together to develop frameworks, empirical studies and policy recommendations that address the operational, ethical and technical dimensions of RegTech. Strengthening partnerships between academia, industry and policymakers can help bridge the gap between conceptual research and practical implementation, ensuring that RegTech solutions are both effective and ethically sound.

## 7. Conclusion

This study provides valuable insights for financial institutions, corporations, technology providers and scholars in sustainability, finance and IS. RegTech enhances compliance with sustainability regulations by automating processes, improving risk management and ensuring data integrity. As regulatory pressures on sustainability increase, RegTech's role will become even more significant in helping institutions navigate complex compliance landscapes.



For academia, this study highlights the need for empirical investigations into RegTech's real-world applications and limitations. Future research should prioritize regulatory, ethical and legal considerations, particularly in data governance, AI transparency and cross-jurisdictional compliance alignment. Developing standardized terminology and conceptual frameworks will help consolidate research across disciplines and support the evolution of RegTech as a key driver of sustainability compliance.

By synthesizing findings from both academic and gray literature, this study contributes to a comprehensive understanding of RegTech's potential, challenges and opportunities in enabling sustainability compliance by companies and financial institutions. Moving forward, collaborative efforts between academia, industry and policymakers will be essential in ensuring that RegTech fulfills its promise of enabling transparent, efficient and effective sustainability compliance.

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