

## Article

# The Moderating Role of Finance, Accounting, and Digital Disruption in ESG, Financial Reporting, and Auditing: A Triple-Helix Perspective

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**Abstract:** This study investigates the moderating role of finance, accounting, and digital disruption (FADD) in the relationship between auditing and sustainability (AS) and financial reporting and ESG integration (FRESGI) through the triple-helix perspective. Drawing on data from 200 experts across corporate, academic, and governmental sectors in Kosovo (2024–Q1 2025), the research applied advanced statistical techniques, including EFA, CFA, and moderation analysis using SPSS and AMOS, to explore both direct and interaction effects. The results reveal that FADD significantly enhances ESG integration, with strong direct effects observed in the corporate sector ( $\beta = 0.259$ ,  $p < 0.001$ ) and public institutions ( $\beta = 0.281$ ,  $p < 0.001$ ). However, the moderation analysis shows that the government dimension of FADD (FADD\_2) negatively influences the relationship between corporate sustainability practices (AS\_1) and ESG reporting, indicating limited coordination across sectors. These findings highlight the need for aligned, sector-specific strategies that harness digital innovation and financial transformation to strengthen sustainable auditing and reporting practices. This study provides actionable insights for policymakers, practitioners, and academics working to advance ESG integration across complex institutional ecosystems.



Academic Editor: Khaled Hussainey

Received: 7 April 2025

Revised: 26 April 2025

Accepted: 27 April 2025

Published: 1 May 2025

**Keywords:** finance; accounting; financial reporting; auditing; digital disruption; sustainability; ESG integration; triple-helix perspective

**Citation:** Lulaj, E., & Brajković, M. (2025). The Moderating Role of Finance, Accounting, and Digital Disruption in ESG, Financial Reporting, and Auditing: A Triple-Helix Perspective. *Journal of Risk and Financial Management*, 18(5), 245. <https://doi.org/10.3390/jrfm18050245>

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## 1. Introduction

The integration of environmental, social, and governance (ESG) principles into financial reporting and auditing practices has become a critical global priority, driven by growing sustainability challenges and increasing stakeholder demands, as highlighted by Mègnigbèto (2024). This urgency is further intensified by the rapid progress of digital transformation, which is reshaping the way financial information is produced, verified, and communicated, according to Argento et al. (2025). Within this evolving environment, the moderating role of finance, accounting, and digital disruption (FADD) in the relationship between auditing and sustainability (AS) and financial reporting and ESG integration (FRESGI) emerges as a crucial area for exploration.

Auditing and sustainability (AS) refers to the practices that ensure environmental and social performance is monitored and reported with transparency and accountability. Financial reporting and ESG integration (FRESGI) captures how financial disclosures incorporate ESG metrics to reflect broader value creation. Finance, accounting, and digital

disruption (FADD) encompasses financial innovations, evolving accounting standards, and digital technologies that are disrupting traditional financial processes. Understanding the dynamics between these constructs is vital for policymakers, corporate leaders, and academics seeking to align sustainability objectives with financial accountability across institutional boundaries, as discussed by [Dimitropoulos \(2025\)](#) and [Benhayoun et al. \(2025\)](#). The novelty of this research lies in the adoption of the triple-helix model—a framework that examines the interactions among academia, industry, and government—to better understand cross-sectoral collaboration in ESG integration. The triple-helix perspective offers a compelling analytical lens by recognizing that innovation and sustainable development are no longer the sole domain of individual sectors but emerge from their dynamic interplay ([Zhou, 2011](#)). This interdisciplinary approach is especially relevant in ESG research, where overlapping institutional responsibilities and divergent priorities often complicate implementation efforts. Unlike previous studies that have addressed ESG, auditing, sustainability, financial reporting, or digital disruption in isolation, this paper adopts a multi-stakeholder and sector-sensitive approach. It differentiates the main constructs into corporate and government/academic subfactors (AS\_1 (corporate), AS\_2 (government/academia); FADD\_1 (corporate), FADD\_2 (government/academia); FRESGI\_1 (corporate), FRESGI\_2 (government/academia)), providing a comprehensive framework for understanding how sector-specific contexts and institutional financial reporting shape digital innovation and institutional collaboration ([Yazici, 2023](#)).

This study aims to explore the moderating role of FADD in the relationship between AS and FRESGI. By employing the triple-helix perspective, it seeks to examine not only the direct relationships between these variables but also how digital technologies, financial innovations, and accounting practices act as enablers or constraints in different institutional contexts, as suggested by [Issa \(2025\)](#) and [Dhaif \(2025\)](#). Specifically, this research addresses the following questions: how do auditing and sustainability (AS) affect financial reporting and ESG integration (FRESGI) across corporate and governmental/academic sectors? Furthermore, to what extent does FADD moderate these relationships? Moreover, how do the moderating effects of FADD differ between corporate (FADD\_1) and governmental/academic (FADD\_2) perspectives, particularly in terms of their influence on corporate sustainability efforts and ESG reporting?

By addressing these questions, this paper fills a significant gap in the existing literature, which has largely overlooked how digital disruption and financial innovation affect the dynamics of ESG reporting and auditing across different sectors. This gap is critical to explore, as evolving regulatory frameworks, corporate strategies, and academic contributions are increasingly interdependent in shaping the future of sustainability reporting, as noted by [Parra-Domínguez et al. \(2025\)](#). Ultimately, this research provides valuable insights into how sector-specific factors and institutional collaborations can shape ESG implementation and financial reporting quality in the digital age.

In summary, this paper is structured as follows: it begins with the introduction, literature review, and hypothesis development, then continues with the methodology, results, and discussions, and finally concludes with the conclusions and directions for future studies.

## 2. Literature Review and Hypothesis Development

As global attention to sustainability intensifies, companies, governments, and academic institutions are increasingly recognizing the critical role that environmental, social, and governance (ESG) factors play in shaping corporate strategies. Integrating ESG considerations into financial reporting and auditing practices has become a significant challenge, driving transformative changes in auditing, accounting, finance, and digital innovation.

The rapid pace of digital disruption is amplifying these changes, introducing new technologies that are redefining the production, verification, and communication of financial information. This literature review examines the moderating role of finance, accounting, and digital disruption (FADD) in the relationship between auditing and sustainability (AS) and financial reporting and ESG integration (FRESGI). Applying the triple-helix perspective, it examines how these constructs interact from the perspectives of business, government, and academia. Synthesizing key scholarly contributions, the review highlights how digital tools, governance structures, financial innovation, and cross-sector collaboration impact ESG integration while identifying important gaps for future research.

Auditing remains a cornerstone for advancing sustainability, but its impact is multifaceted and complex. [Mahsina et al. \(2025\)](#) reveal that while effective auditing committees are essential for risk management, their direct influence on sustainability outcomes remains limited. This indicates that auditing must be complemented by broader institutional mechanisms to foster substantial sustainability improvements. [Bebbington and Larrinaga \(2024\)](#) emphasize that auditing practices drive environmental accountability, reinforcing the critical link between assurance processes and sustainability reporting. [Dimitropoulos \(2025\)](#) adds that firms demonstrating robust sustainability performance are less likely to receive qualified audit opinions, suggesting that sustainability practices can enhance both environmental and financial credibility through effective and independent audit structures. Corporate governance structures also play a key role. [Ahmed \(2023\)](#) highlights the importance of board independence and dedicated risk management committees in strengthening integrated reporting (IR). While boardroom expertise can sometimes introduce complexity, it remains clear that effective governance is fundamental to aligning financial reporting with sustainability goals and achieving long-term organizational commitments to the Sustainable Development Goals (SDGs).

The intersection of finance, accounting, and digital technologies is transforming ESG practices. [Lodhia et al. \(2025\)](#) demonstrate how artificial intelligence and big data analytics enhance ESG reporting by ensuring greater accuracy, transparency, and comprehensiveness. [Mouazen et al. \(2025\)](#) present the “Organization Value Chain 5.0” model, highlighting the catalytic role of advanced technologies and knowledge management in driving sustainable performance. Despite these advances, [Kaur et al. \(2025\)](#) found that the public and nonprofit sectors still face significant barriers—both organizational and political—to fully leveraging digital tools in ESG processes, underscoring the need for robust stakeholder engagement mechanisms. According to [Lulaj \(2025a\)](#), the analysis shows that cost efficiency has a positive impact on investment dynamics and operational development, while investments also positively affect operational development; for sustainable growth, firms must integrate investment strategies, operational efficiency, and development capacities. [Lulaj et al. \(2025\)](#) found that strategic profits and entrepreneurial expectations in women-led businesses are driven by financing, investing, and strategic performance factors. These influence financial reporting, investment decisions, and competitiveness. Weak managerial skills, lack of innovation, and poor debt management can hinder sustainability, ESG integration, and adaptation to financial digital disruption. Furthermore, [Amin et al. \(2025\)](#) stress the critical necessity for accountants to develop digital competencies, ensuring the accounting profession evolves alongside technological transformations.

Collaboration among academia, industry, and government—central to the triple-helix model—is increasingly vital for advancing ESG strategies. [Ivanova \(2024\)](#) illustrates how cross-sector partnerships foster innovation and strengthen ESG research, enabling the development of more resilient and inclusive sustainability practices. [Leung et al. \(2025\)](#) highlight that economic instability, especially in developing economies, can severely

undermine ESG performance, pointing to the need for resilient collaborative frameworks that can withstand financial shocks.

Gunn et al. (2024) show how corporate social responsibility (CSR) initiatives can enhance the reputation of audit firms, especially when these firms lack deep industry specialization. Their findings suggest that CSR not only enhances brand equity but also bridges the gap between sustainability initiatives and financial accountability. T. Nguyen et al. (2025) emphasize that successful digital transformation in accounting requires clear strategic alignment, top management commitment, and organizational awareness, without which the potential benefits of ESG integration may not be realized. Lulaj and Minguez-Vera (2024) emphasize that effective cash flow management, supported by technology and precise financial strategies, strengthens resilience and sustainability, aligning with financial reporting, digital disruption, and long-term ESG goals. Kastrup et al. (2025) reinforce this view, noting that the impact of data analytics on accounting outcomes is critically dependent on the underlying business strategies and accounting frameworks. Li and Han (2025) explore the double-edged nature of inclusive digital finance, highlighting its potential to negatively affect enterprise sustainability if unchecked. However, their study also shows that strong internal auditing functions can mitigate these risks, reaffirming the crucial role of auditing in sustaining both financial integrity and ESG commitments in a rapidly digitizing economy.

In summary, this literature review offers a comprehensive, interdisciplinary understanding of the complex relationships among auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI). By framing these relationships through the triple-helix model, this study provides a robust theoretical foundation for hypothesis development, emphasizing the necessity of multi-sector collaboration, technological adaptation, and governance innovation for advancing ESG integration. These insights significantly inform the hypotheses proposed in the following section.

### 2.1. Hypotheses Development

Sustainability reporting has become a critical component of corporate responsibility, transparency, and governance. The integration of environmental, social, and governance (ESG) factors into corporate reporting is reshaping business operations and stakeholder engagement. As Barker (2025) notes, sustainability reporting plays a key role in shaping corporate strategies and their broader impact on stakeholders. This intersection between sustainability and financial reporting influences investment decisions, making it essential to examine how these factors are interrelated in business practices. A crucial aspect of this integration is auditing, which plays a significant role in ensuring the accuracy and reliability of ESG disclosures. Emblen-Perry (2022) emphasizes how auditing fosters critical thinking and sustainability practices by equipping professionals with the skills necessary for incorporating ESG factors into corporate reporting. These auditing processes highlight the essential connection between financial reporting, sustainability, and ESG integration. Lewa et al. (2025) further strengthen this link by exploring the governance role in sustainability reporting. Their research suggests that independent audit committees are integral to ensuring the quality of sustainability disclosures. Such governance structures underscore the need for robust financial and governance frameworks to facilitate the incorporation of ESG criteria into corporate financial statements. Moreover, their findings suggest that compensation structures must align with sustainability goals to drive effective ESG integration.

Innovation frameworks, such as the triple-helix model, also provide valuable insights into the role of finance, accounting, and digital disruption (FADD) in ESG integration.

Villarreal and Calvo (2015) critique this model, suggesting that new frameworks are needed to better align sustainability practices with financial reporting, especially in the face of digital disruption. This perspective sets the stage for understanding how innovative structures can support the integration of ESG factors into financial practices. Leadership and education further influence ESG performance. Oyinlola (2025) explores how CEO and board member education enhances ESG performance, suggesting that leadership competencies are critical for integrating ESG factors into corporate strategies. This insight is central to the moderating role of FADD in shaping ESG integration, as leadership competencies in finance and accounting can significantly impact the adoption of sustainability practices.

The work of Almnadheh et al. (2025) further enriches our understanding by highlighting how ESG principles are incorporated into corporate governance, particularly through mechanisms of legitimacy, ethical considerations, and motivation. These mechanisms are underpinned by financial and accounting systems that drive ESG disclosures. Together, these insights form the basis for exploring the moderating role of FADD in shaping corporate ESG strategies and financial reporting. As the global environment of sustainability reporting continues to evolve, Qian et al. (2025) stress the importance of local regulatory contexts in influencing the scope and depth of ESG disclosures, especially in developing economies. Their findings indicate that global standards must be adapted to accommodate local frameworks, reinforcing the need to examine the effects of FADD on ESG integration within specific regulatory environments. The role of digital technologies, such as artificial intelligence (AI) and digital platforms, is also critical in enhancing the quality and efficiency of ESG reporting. Naveed et al. (2025) and Huang et al. (2025) provide compelling evidence that AI and digital technologies improve the accuracy and comprehensiveness of ESG disclosures. These advancements are integral to the moderating role of FADD, which enhances both the auditing process and the effectiveness of ESG reporting (FRESGI).

Leadership competencies in promoting sustainability and auditing (AS) have been further explored by Twesigye et al. (2025), who emphasize that management behavior significantly influences the outcomes of sustainability projects. This reinforces the idea that leadership within finance and accounting can influence the integration of ESG principles into corporate strategies. Furthermore, Ferdinands et al. (2024) highlight the importance of cross-sector collaboration, supporting the view that interactions between finance, accounting, and digital disruption enhance ESG integration from a triple-helix perspective. The influence of digital transformation is also evident in reducing financial constraints, as Zhang et al. (2025) observe that digitization decreases companies' reliance on inter-corporate financing. This aligns with the broader theme of how digital disruption can improve the efficiency and accuracy of ESG reporting. Similarly, Liu et al. (2025) discuss how digital finance can enhance audit quality, further supporting the hypothesis that FADD plays a significant role in improving both financial reporting practices and ESG integration.

Based on the insights derived from the literature, the following hypotheses and sub-hypotheses are proposed to guide this study. These hypotheses aim to explore the direct, moderating, and interaction effects of finance, accounting, and digital disruption (FADD), auditing and sustainability (AS), and financial reporting and ESG integration (FRESGI).

#### 2.1.1. Direct Effects

This hypothesis draws from Naveed et al. (2025), Huang et al. (2025), and Abdelwahed et al. (2025), which indicate that finance, accounting, digital transformation, and AI improve the quality and transparency of ESG reporting, thereby influencing corporate financial disclosures.

**H1.** *Finance, accounting, and digital disruption (FADD) exerts a direct, positive, and statistically significant effect on financial reporting and ESG integration (FRESGI).*

$$\text{FRESGI} = \beta_0 + \beta_1 \cdot \text{FADD} + \mu \quad (1)$$

These sub-hypotheses examine how FADD affects ESG integration from the corporate and government/academic perspectives, building on the work of [Oyinklola \(2025\)](#) and [Lewa et al. \(2025\)](#) within a triple-helix perspective.

Sub-hypotheses H1a–H1d:

**H1a.** *FADD\_1 has a direct effect on FRESGI\_2.*

**H1b.** *FADD\_2 has a direct effect on FRESGI\_2.*

**H1c.** *FADD\_1 has a direct effect on FRESGI\_1.*

**H1d.** *FADD\_2 has a direct effect on FRESGI\_1.*

Rooted in [Emblen-Perry \(2022\)](#) and [Lewa et al. \(2025\)](#), this hypothesis emphasizes the crucial role of auditing in enhancing the quality of auditing and sustainability (AS) disclosures and fostering financial reporting and ESG integration (FRESGI).

**H2.** *Auditing and sustainability (AS) exerts a direct, positive, and statistically significant effect on financial reporting and ESG integration (FRESGI).*

$$\text{FRESGI} = \beta_0 + \beta_2 \cdot \text{AS} + \mu \quad (2)$$

These sub-hypotheses explore how AS influences ESG integration from both corporate and government/academic perspectives, as informed by [Qian et al. \(2025\)](#) and [Villarreal and Calvo \(2015\)](#).

Sub-hypotheses H2a–H2d:

**H2a.** *AS\_1 has a direct effect on FRESGI\_2.*

**H2b.** *AS\_2 has a direct effect on FRESGI\_2.*

**H2c.** *AS\_1 has a direct effect on FRESGI\_1.*

**H2d.** *AS\_2 has a direct effect on FRESGI\_1.*

### 2.1.2. Moderation Effects

These moderation effects are supported by [Huang et al. \(2025\)](#) and [Abdelwahed et al. \(2025\)](#), which demonstrate how the combination of auditing and sustainability (AS) and finance, accounting, and digital disruption (FADD) enhances the accuracy and credibility of financial reporting and ESG integration (FRESGI). Therefore, these sub-hypotheses explore the interaction effects between AS and FADD on FRESGI, further extending the work of [Qian et al. \(2025\)](#) and [Almnadheh et al. \(2025\)](#).

Interaction 1 (H3a & H3b):

**H3a.** *The interaction between AS\_1 and FADD\_1 moderates the effect on FRESGI\_2.*

**H3b.** *The interaction between AS\_1 and FADD\_1 moderates the effect on FRESGI\_1.*

$$\text{FRESGI}_{1,2} = \beta_0 + \beta_1 \cdot \text{AS}_1 + \beta_2 \cdot \text{FADD}_1 + \beta_3 \cdot (\text{AS}_1 \times \text{FADD}_1) + \mu \quad (3)$$

where  $x \in \{1,2\}$ , representing the corporate (FRESEG\_1) and government/academia (FRESEG\_2) perspectives.

Interaction 2 (H3c and H3d):

**H3c.** *The interaction between AS\_1 and FADD\_2 moderates the effect on FRESGI\_2.*

**H3d.** *The interaction between AS\_1 and FADD\_2 moderates the effect on FRESGI\_1.*

$$\text{FRESGI}_{1,2} = \beta_0 + \beta_1 \cdot \text{AS}_1 + \beta_2 \cdot \text{FADD}_2 + \beta_3 \cdot (\text{AS}_1 \times \text{FADD}_2) + \mu \quad (4)$$

Interaction 3 (H3e and H3f):

**H3e.** *The interaction between AS\_2 and FADD\_1 moderates the effect on FRESGI\_2.*

**H3f.** *The interaction between AS\_2 and FADD\_1 moderates the effect on FRESGI\_1.*

$$\text{FRESGI}_{1,2} = \beta_0 + \beta_1 \cdot \text{AS}_2 + \beta_2 \cdot \text{FADD}_1 + \beta_3 \cdot (\text{AS}_2 \times \text{FADD}_1) + \mu \quad (5)$$

Interaction 4 (H3g and H3h):

**H3g.** *The interaction between AS\_2 and FADD\_2 moderates the effect on FRESGI\_2.*

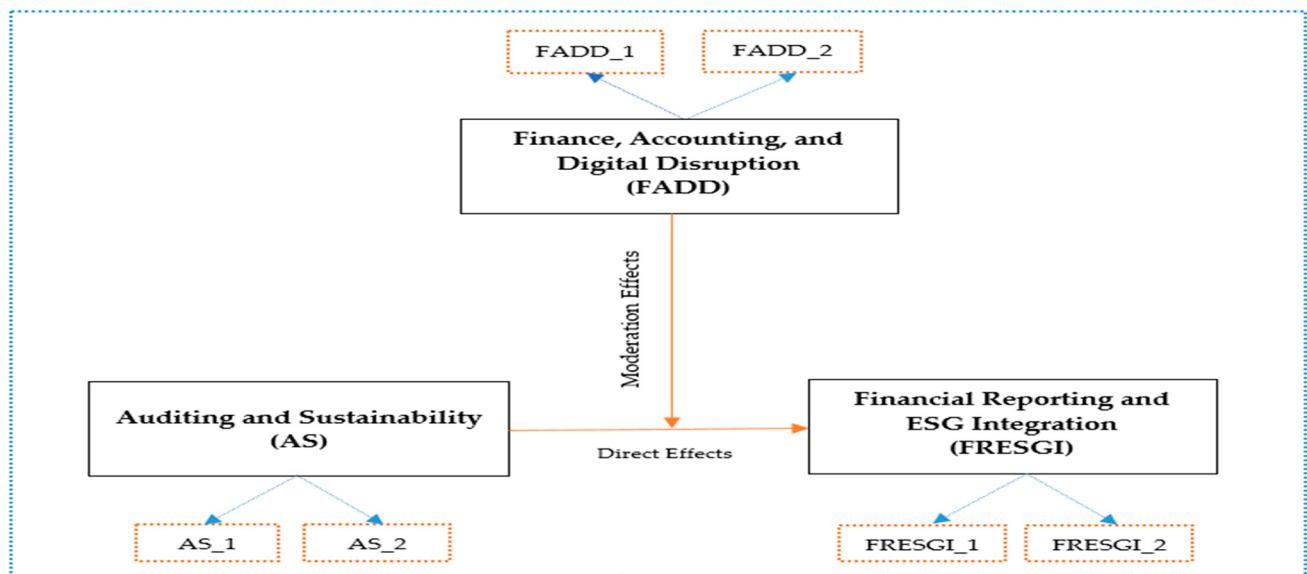
**H3h.** *The interaction between AS\_2 and FADD\_2 moderates the effect on FRESGI\_1.*

$$\text{FRESGI}_{1,2} = \beta_0 + \beta_1 \cdot \text{AS}_2 + \beta_2 \cdot \text{FADD}_2 + \beta_3 \cdot (\text{AS}_2 \times \text{FADD}_2) + \mu \quad (6)$$

The literature reviewed establishes that governance structures, digital transformation, leadership competencies, and auditing processes are all crucial to the effective integration of ESG factors into financial reporting. These elements form the basis for the hypotheses and sub-hypotheses presented here, providing a conceptual model for empirically testing the direct, moderating, and interaction effects of FADD and AS on FRESGI.

Figure 1 presents the conceptual model grounded in the triple-helix perspective, illustrating the interactions among auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI). Within this framework, AS functions as the independent variable (IV), FRESGI as the dependent variable (DV), and FADD as a moderating factor, shaping the AS–FRESGI relationship. The model systematically categorizes each construct across two dimensions—corporate (AS\_1, FADD\_1, FRESGI\_1) and government/academia (AS\_2, FADD\_2, FRESGI\_2)—capturing the interplay between industry dynamics and institutional governance. The direct effects (H1, H2) posit that both FADD and AS exert a positive effect on ESG-integrated financial reporting (FRESGI), reinforcing the critical role of financial innovation and sustainability auditing in advancing ESG disclosure practices. Moreover, the moderation effect (H3) suggests that FADD interacts with AS, potentially amplifying or modifying its influence on FRESGI, underscoring the transformative role of digital disruption in financial reporting frameworks.

By integrating the perspectives from corporate finance, regulatory oversight, and academic inquiry, this model provides a structured and theoretically grounded approach to understanding the mechanisms through which financial digitalization and sustainability-driven auditing facilitate ESG integration in financial reporting. The findings derived from this framework hold substantial implications for corporate governance, regulatory frameworks, and scholarly discourse on ESG and financial transparency.



**Figure 1.** Conceptual model of AS, FADD, and FRESGI within the triple-helix perspective. Source: prepared by the authors. Note: Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives). Factor 3: financial reporting and ESG integration (FRESGI) includes FRESGI\_1 (corporate perspective) and FRESGI\_2 (government and academia perspectives). Independent variable (IV), dependent variable (DV), and moderator (Mod.). Interaction1 ( $AS_1 \times FADD_1 \rightarrow FRESGI_1$ ),  $AS_1 \times FADD_1 \rightarrow FRESGI_2$ ), Interaction2 ( $AS_1 \times FADD_2 \rightarrow FRESGI_1$ ,  $AS_1 \times FADD_2 \rightarrow FRESGI_2$ ), Interaction3 ( $AS_2 \times FADD_1 \rightarrow FRESGI_1$ ,  $AS_2 \times FADD_1 \rightarrow FRESGI_2$ ), and Interaction4 ( $AS_2 \times FADD_2 \rightarrow FRESGI_1$ ,  $AS_2 \times FADD_2 \rightarrow FRESGI_2$ ).

Table 1 presents the hypothesized moderating effects of auditing and sustainability (AS) and finance, accounting, and digital disruption (FADD) on financial reporting and ESG integration (FRESGI), analyzed through the lens of the triple-helix perspective. The interactions are examined across corporate and institutional (government and academia) perspectives. Each interaction term reflects the combined influence of AS and FADD on FRESGI outcomes, corresponding to hypotheses H3a through H3h.

**Table 1.** Hypothesized moderating effects of AS, FADD, and FRESGI within the triple-helix perspective.

| Factors                                            | Role | Interaction   | Equation               | Moderates | Outcome            | Theories                                                         |
|----------------------------------------------------|------|---------------|------------------------|-----------|--------------------|------------------------------------------------------------------|
| Auditing and Sustainability (AS)                   | IV   |               |                        |           |                    | Triple-Helix Model of Innovation (Etzkowitz & Leydesdorff, 1995) |
| Financial Reporting and ESG Integration (FRESGI)   | DV   | Interaction 1 | $(AS_1 \times FADD_1)$ | H3a, H3b  | FRESGI_2, FRESGI_1 | Stakeholder Theory (Freeman, 1984)                               |
|                                                    |      | Interaction 2 | $(AS_1 \times FADD_2)$ | H3c, H3d  | FRESGI_2, FRESGI_1 | Legitimacy Theory-Suchman (1995)                                 |
|                                                    |      | Interaction 3 | $(AS_2 \times FADD_1)$ | H3e, H3f  | FRESGI_2, FRESGI_1 | Agency Theory (Jensen & Meckling, 1976)                          |
|                                                    |      | Interaction 4 | $(AS_2 \times FADD_2)$ | H3g, H3h  | FRESGI_2, FRESGI_1 | Signaling Theory (Spence, 1973)                                  |
| Finance, Accounting, and Digital Disruption (FADD) | Mod. |               |                        |           |                    | Theory of Disruptive Innovation (Christensen, 1997)              |
|                                                    |      |               |                        |           |                    | Institutional Theory (DiMaggio & Powell, 1983)                   |

Source: prepared by the authors. Note: Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives). Factor 3: financial reporting and ESG integration (FRESGI) includes FRESGI\_1 (corporate perspective) and FRESGI\_2 (government and academia perspectives). Independent variable (IV), dependent variable (DV), and moderator (Mod.).

### 3. Materials and Methods

#### 3.1. Purpose of This Paper

This paper investigates the moderating role of finance, accounting, and digital disruption (FADD) in the relationship between auditing and sustainability (AS) and financial reporting and ESG integration (FRESGI) through the triple-helix perspective. It also examines how sectoral distinctions, interaction effects, and moderating variables influence these relationships across corporate, governmental, and academic contexts, providing valuable insights for practitioners, policymakers, and scholars in the fields of finance, accounting, auditing, financial reporting, and sustainability.

#### 3.2. Survey Instrument Development

The survey instrument was meticulously developed based on a comprehensive review of relevant literature in auditing, sustainability, finance, accounting, digital disruption, and ESG integration. Existing validated scales were adapted where appropriate to ensure their construct validity and relevance to the Kosovo context. The instrument was structured around three key constructs: auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI).

The survey underwent a two-stage pre-testing process:

- ✓ Expert review: Five academics and five industry practitioners reviewed the questionnaire for content validity, clarity, and relevance.
- ✓ Pilot study: A small sample of 20 respondents participated in a pilot test. Based on their feedback, minor adjustments were made to item wording to enhance clarity and ensure respondent comprehension.

This rigorous development and validation process ensured that the survey instrument was both theoretically grounded and contextually appropriate.

#### 3.3. Sampling Procedure and Sample Size Justification

This study employed a purposive sampling strategy, targeting experts from corporate, government, and academic sectors who are actively involved in sustainability, auditing, accounting, or ESG-related activities in Kosovo. This targeted approach was selected to ensure that the participants possessed sufficient domain knowledge, thereby enhancing the quality and relevance of responses. The sample size ( $N = 200$ ) was determined based on guidelines for structural equation modeling (SEM) and moderation analysis, where a minimum of 200 cases is generally recommended to achieve sufficient statistical power (Kline, 2015).

This sample size was also consistent with Cohen's (1992) standards for detecting medium to large effect sizes in moderation models with adequate power (0.80).

The participants were invited through a combination of direct invitations sent via email based on professional networks, institutional contacts within universities, governmental agencies, corporate associations, and professional auditing and accounting bodies operating in Kosovo.

#### 3.4. Data Analysis

The data analysis in this study adheres to a rigorous methodological framework designed to ensure the reliability and validity of findings concerning the direct and moderating effects of auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI) within the triple-helix perspective. The total sample size ( $N = 200$ ) was determined in accordance with the established guidelines for moderation analysis, ensuring sufficient statistical power for hypothesis testing. This is consistent with Kline's (2015) recommendation that a minimum of 200 cases

is required for analyses. Data analysis was conducted using SPSS (24) and AMOS (26.0), employing a combination of exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and moderation analysis to examine both direct effects and interaction effects among the key constructs (AS, FADD, and FRESGI).

Exploratory factor analysis (EFA), following [Spearman's \(1927\)](#) methodology, was employed to identify and validate the factor structures. Auditing and sustainability (AS) was divided into two subfactors: corporate (AS\_1) and government/academia (AS\_2) perspectives. Similarly, finance, accounting, and digital disruption (FADD) were analyzed across both corporate (FADD\_1) and government/academia (FADD\_2) perspectives. Financial reporting and ESG integration (FRESGI) was also examined from these two perspectives: corporate (FRESGI\_1) and government/academia (FRESGI\_2). The EFA process was essential in clearly distinguishing and validating the constructs and their respective subfactors. Construct validity and reliability were assessed using the following thresholds: factor loadings greater than 0.50, a significance level of  $p < 0.001$ , and Cronbach's alpha ( $\alpha \geq 0.70$ ), which are well-established benchmarks in finance, accounting, and auditing research ([Benjamini & Hochberg, 1995](#)). A factor loading threshold of 0.50 was applied to confirm that each item meaningfully contributed to its respective construct, in line with the recommendations of [Hair et al. \(2014\)](#). Reliability was evaluated using Cronbach's alpha, with  $\alpha \geq 0.70$  serving as the benchmark for internal consistency, as outlined by [Cronbach \(1951\)](#) and [Nunnally and Bernstein \(1994\)](#).

Confirmatory factor analysis (CFA) was performed following [Joreskog's \(1969\)](#) methodology to validate the hypothesized factor structures. Both unstandardized and standardized regression coefficients ( $\beta$ ) and correlation coefficients ( $r$ ) were assessed to confirm the relationships among the latent variables. Moderation analysis was conducted using fit indices such as RMSEA, SRMR, CFI, and TLI, following the guidelines of [Hooper et al. \(2008\)](#) and [Bentler \(1990\)](#). Model fit criteria were set to  $CFI \geq 0.95$  ([West et al., 2012](#)) to ensure optimal model stability and a good fit. This methodological approach ensures rigor and provides a reliable basis for drawing meaningful conclusions regarding the moderating role of FADD in the context of AS and FRESGI within the triple-helix framework (encompassing corporate, government, and academia).

### 3.5. Data Collection

This study gathered data from 200 experts across corporate, academic, and government sectors in Kosovo. The data collection process spanned from 2024 to the first quarter of 2025, utilizing a combination of online questionnaires and face-to-face interviews. The online questionnaires employed a 5-point Likert scale (ranging from 5 = strongly agree to 1 = strongly disagree). All participants were thoroughly informed that their responses would remain confidential and would be used solely for research purposes. Informed consent was explicitly obtained, ensuring that the participants understood the study's objectives before providing their responses.

### 3.6. Development and Validation of Key Constructs

The auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI) constructs were developed through an extensive literature review and expert feedback. Each construct has been operationalized with two subfactors: AS (AS\_1 and AS\_2), FADD (FADD\_1 and FADD\_2), and FRESGI (FRESGI\_1 and FRESGI\_2). A structured questionnaire was created and validated through cognitive interviews and pilot testing to ensure clarity, reliability, and effective representation of the constructs within the triple-helix framework.

Table 2 provides detailed descriptions and theoretical foundations for the study's variables, structured across the triple-helix dimensions of corporate, government, and academic perspectives. The first factor, auditing and sustainability (AS), encompasses both internal and external auditing functions, addressing ethical conduct, digital transformation, and policy alignment to promote transparency, governance, and economic stability. The second factor, financial reporting and ESG integration (FRESGI), reflects the role of transparent, real-time, and sustainability-aligned financial disclosures in enhancing decision-making, investor trust, and long-term resilience. The third factor, finance, accounting, and digital disruption (FADD), captures the intersection of fintech adoption, financial planning, human capital investment, and regulatory innovations aimed at enabling sustainable and inclusive financial systems. Each item in Table 2 draws on current academic and policy literature, reinforcing the multidimensional and interrelated nature of AS, FADD, and FRESGI in advancing ESG-driven financial reporting and accountability within the triple-helix perspective.

**Table 2.** Description and definition of study's variables.

| Factor 1<br>Auditing and Sustainability (AS)              |                                                                                                                             |                                                                                                                            |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Subfactor 1: Corporate Perspective (ASCP)                 |                                                                                                                             |                                                                                                                            |
| Item                                                      | Constructs                                                                                                                  | Source                                                                                                                     |
| AS1                                                       | Auditing helps corporates implement fair labor policies and uphold decent work conditions.                                  | <a href="#">Emblen-Perry (2019)</a><br><a href="#">Lulaj (2025b)</a>                                                       |
| AS2                                                       | Strong internal auditing practices improve corporate governance, sustainability accountability, and risk management.        | <a href="#">Pumphrey and Crain (2008)</a><br><a href="#">Kukalaj et al. (2025)</a><br><a href="#">Lulaj et al. (2024b)</a> |
| AS3                                                       | The digital transformation of auditing (AI, blockchain, automation) enhances transparency, efficiency, and fraud detection. | <a href="#">Avdimetaj et al. (2025)</a><br><a href="#">Ruiz-Barbadillo and Martínez-Ferrero (2022)</a>                     |
| AS4                                                       | Independent auditing helps detect and prevent financial misstatements, fraud, and ESG violations.                           | <a href="#">Lulaj et al. (2024a)</a>                                                                                       |
| AS5                                                       | Ethical and sustainable auditing practices drive long-term economic growth and responsible business conduct.                | <a href="#">Gao and Zhang (2006)</a>                                                                                       |
| Subfactor 2: Government and Academia Perspectives (ASGAP) |                                                                                                                             |                                                                                                                            |
| AS6                                                       | Government regulations play a critical role in ensuring ethical, transparent, and sustainable auditing practices.           |                                                                                                                            |
| AS7                                                       | Auditing contributes to financial stability and reduces the risk of economic and labor market crises.                       |                                                                                                                            |
| AS8                                                       | Public sector audits strengthen fiscal accountability, ensuring effective use of resources for economic development.        |                                                                                                                            |
| AS9                                                       | Auditing standards should evolve to integrate ESG (environmental, social, and governance) factors into financial oversight. |                                                                                                                            |
| AS10                                                      | Collaborations between corporates, the government, and academia advance research and innovation in sustainable auditing.    |                                                                                                                            |

Table 2. Cont.

| Factor 2<br>Financial Reporting and ESG Integration (FRESGI)   |                                                                                                                                                 |                                                 |
|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| Subfactor 1: Corporate Perspective (FRESGICP)                  |                                                                                                                                                 |                                                 |
| FRESGI1                                                        | Transparent financial reporting enhances investor confidence and supports sustainable economic growth.                                          | <a href="#">De Silva et al. (2025)</a>          |
| FRESGI2                                                        | Real-time and digital financial reporting systems improve decision-making and risk assessment.                                                  | <a href="#">N. M. Nguyen et al. (2025)</a>      |
| FRESGI3                                                        | Reliable and verifiable financial statements improve corporate creditworthiness and long-term financial stability.                              | <a href="#">Rani et al. (2025)</a>              |
| FRESGI4                                                        | Corporate fiscal transparency enhances responsible governance, risk management, and equitable economic policies.                                | <a href="#">Jamaludin et al. (2025)</a>         |
| FRESGI5                                                        | The integration of sustainability metrics into financial reports supports long-term business profitability and economic resilience.             | <a href="#">Liudmyla and Maria (2022)</a>       |
| Subfactor 2: Government and Academia Perspectives (FRESGIGAP)  |                                                                                                                                                 | <a href="#">D'Aquila (1998)</a>                 |
| FRESGI6                                                        | ESG and sustainability disclosures should be mandatory for corporate reporting and investor decision-making.                                    |                                                 |
| FRESGI7                                                        | International financial reporting standards (IFRS) improve global trade, cross-border investments, and sustainability compliance.               |                                                 |
| FRESGI8                                                        | Third-party verification of financial and ESG reports enhances corporate credibility and stakeholder trust.                                     |                                                 |
| FRESGI9                                                        | Effective financial reporting reduces economic inequality by promoting fair wages, job creation, and inclusive growth.                          |                                                 |
| FRESGI10                                                       | The use of AI and blockchain in financial reporting has increased accuracy, efficiency, and fraud prevention.                                   |                                                 |
| Factor 3<br>Finance, Accounting, and Digital Disruption (FADD) |                                                                                                                                                 |                                                 |
| Subfactor 1: Corporate Perspective (FADDCP)                    |                                                                                                                                                 |                                                 |
| FADD1                                                          | Responsible financial management is essential for corporate sustainability, job security, and economic stability.                               | <a href="#">Lulaj et al. (2024c)</a>            |
| FADD2                                                          | The adoption of fintech (AI, blockchain, digital banking) expands financial accessibility and promotes economic participation.                  | <a href="#">Thakur et al. (2023)</a>            |
| FADD3                                                          | Corporate financial planning and responsible investment strategies drive sustainable national economic development.                             | <a href="#">Zimand-Sheiner and Earon (2019)</a> |
| FADD4                                                          | Ethical financial decision-making supports fair employment, decent wages, and long-term job creation.                                           | <a href="#">Lulaj (2021)</a>                    |
| FADD5                                                          | Investment in human capital strengthens financial stability, innovation, and sustainable business growth.                                       | <a href="#">Fauzel et al. (2024)</a>            |
| Subfactor 2: Government and Academia Perspectives (FADDGAP)    |                                                                                                                                                 | <a href="#">Wawak et al. (2024)</a>             |
| FADD6                                                          | Risk management strategies, including ESG risk assessment, are crucial for corporate resilience in uncertain economic environments.             | <a href="#">Ayalew and Zhang (2025)</a>         |
| FADD7                                                          | Corporate financial policies and tax strategies influence employment, wages, and sustainable business growth.                                   | <a href="#">Alsughayer (2025)</a>               |
| FADD8                                                          | Corporate financial regulations should align with sustainability goals, responsible investments, and green financing.                           | <a href="#">Hiew et al. (2025)</a>              |
| FADD9                                                          | Access to financial education and digital literacy enhances workforce productivity and financial inclusion.                                     | <a href="#">Lulaj and Iseni (2018)</a>          |
| FADD10                                                         | Accounting innovations, including automation and AI-driven analytics, improve corporate financial decision-making and sustainability reporting. | <a href="#">Sutton (2010)</a>                   |

Source: prepared by the author, based on the conceptual model and literature review on AS, FADD, and FRESGI within the triple-helix perspective. Note: Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives). Factor 3: financial reporting and ESG integration (FRESGI) includes FRESGI\_1 (corporate perspective) and FRESGI\_2 (government and academia perspectives).

#### 4. Results

This section presents the empirical findings derived from a robust econometric framework designed to examine the direct and moderating relationships among auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI) within the triple-helix perspective. The analysis follows a sequential approach involving exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and moderation analysis, allowing for a rigorous assessment of both main effects and interaction effects. Each construct—AS (independent variable), FADD (moderator), and FRESGI (dependent variable)—is analyzed across corporate and government/academia perspectives, reflecting both practical and institutional dimensions. The results are presented through descriptive statistics, correlation matrices, factor loadings, reliability measures, model fit indices, and regression outputs. The results, detailed in the following tables, provide empirical support for the interrelated roles of AS, FADD, and FRESGI, confirming the proposed conceptual framework and highlighting the conditional influence of FADD on ESG-integrated financial reporting.

Table 3 provides a comprehensive demographic analysis of the respondents from the corporate, government, and academic sectors, highlighting the key trends in gender, age, education, professional roles, and organizational practices that are related to finance, accounting, and digital disruption within the context of ESG, financial reporting, and auditing. The gender distribution reveals a moderate gap, with 50% male and 39% female respondents, while 11% chose not to disclose their gender. The majority of respondents are mid-career professionals, with 64.5% aged between 26 and 45 years, and a highly educated sample—45.5% hold master's degrees, and 16.5% possess PhDs. The corporate sector is the largest contributor, particularly in financial management and auditing roles. Additionally, 97.5% of the respondents report the presence of internal audit departments, and 99.5% affirm the existence of clear policies on financial reporting and sustainability. The use of advanced financial technologies, reported by 95.5% of the respondents, underscores the significant role of digital disruption in financial management and auditing. These findings align with the paper's focus on the moderating role of finance, accounting, and digital disruption in shaping ESG and financial reporting practices through the lens of the triple-helix perspective.

Table 4 presents a correlation analysis that examines the relationships between demographic factors, employment characteristics, and key dimensions of financial governance, including auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI). The results indicate that gender does not show significant correlations with any of the financial governance variables, suggesting that gender does not influence an organization's approach to financial oversight or technology adoption.

**Table 3.** Respondents' demographics within the triple-helix perspective.

| Category | Variable |                      | Freq. | %    |
|----------|----------|----------------------|-------|------|
| Gen.     | G        | Male                 | 100   | 50.0 |
|          | A        | Female               | 78    | 39.0 |
|          | C        | Prefer not to answer | 22    | 11.0 |
| Age      |          | 18–25 years          | 12    | 6.0  |
|          | G        | 26–35 years          | 65    | 32.5 |
|          | A        | 36–45 years          | 64    | 32.0 |
|          | C        | 46–55 years          | 36    | 18.0 |
|          |          | Over 56 years        | 23    | 11.5 |

**Table 3.** *Cont.*

| Category | Variable |                              | Freq. | %    |
|----------|----------|------------------------------|-------|------|
| Edu.     | G        | Bachelor's degree            | 76    | 38.0 |
|          | A        | Master's degree              | 91    | 45.5 |
|          | C        | PhD                          | 33    | 16.5 |
| Pos.     | G        | Ministry Official (ME, MFLT) | 2     | 1.0  |
|          | A        | Academic Staff               | 33    | 16.5 |
|          |          | Financial Manager            | 27    | 13.5 |
|          |          | General Manager              | 38    | 19.0 |
|          | C        | Accountant                   | 50    | 25.0 |
|          |          | Business Owner               | 21    | 10.5 |
|          |          | Internal Auditor             | 15    | 7.5  |
|          |          | Director                     | 14    | 7.0  |
| WE       | G        | 1–5 years                    | 10    | 5.0  |
|          | A        | 6–10 years                   | 91    | 45.5 |
|          | C        | Over 10 years                | 99    | 49.5 |
| ES       | G        | Public                       | 33    | 16.5 |
|          | A        | Private                      | 167   | 83.5 |
|          | C        |                              |       |      |
| DIAD     | G        | Yes                          | 195   | 97.5 |
|          | A        | No                           | 0     | 0.0  |
|          | C        | Don't know                   | 5     | 2.5  |
| CPFRS    | G        | Yes                          | 199   | 99.5 |
|          | A        | No                           | 0     | 0.0  |
|          | C        | Don't know                   | 1     | 0.5  |
| UATFMA   | G        | Yes                          | 191   | 95.5 |
|          | A        | No                           | 2     | 1.0  |
|          | C        | Don't know                   | 7     | 3.5  |

Source: authors' calculations based on survey data. Note: Freq. (frequency), C (corporate), G (government), A (academia), Gen. (gender), Edu. (education), Pos. (position), WE (work experience), ES (employment sector), DIAD (dedicated internal audit department), CPFRS (clear policies on financial reporting and sustainability), UATFMA (use of advanced technologies (AI, blockchain, automation) in financial management and auditing), ME (Ministry of Economy), and MFLT (Ministry of Finance, Labor, and Transfers).

**Table 4.** Correlation analysis of demographics within the triple-helix perspective.

| Variable | Mean | Std. Dev. | Gen.  | Age.   | Edu.   | Pos.  | WE    | ES      | AS      | FRESGI  | FADD     | DIAD  | CPFRS | UATEMA |
|----------|------|-----------|-------|--------|--------|-------|-------|---------|---------|---------|----------|-------|-------|--------|
| Gen      | 1.61 | 0.69      | 1     |        |        |       |       |         |         |         |          |       |       |        |
| Age      | 2.97 | 1.11      | −0.01 | 1      |        |       |       |         |         |         |          |       |       |        |
| Edu      | 2.79 | 0.71      | −0.06 | −0.10  | 1      |       |       |         |         |         |          |       |       |        |
| Pos.     | 4.64 | 2.03      | −0.01 | 0.11   | 0.15 * | 1     |       |         |         |         |          |       |       |        |
| WE       | 2.46 | 0.60      | −0.00 | −0.01  | −0.02  | 0.00  | 1     |         |         |         |          |       |       |        |
| ES       | 1.84 | 0.37      | 0.00  | −0.05  | −0.04  | 0.13  | −0.10 | 1       |         |         |          |       |       |        |
| AS       | 4.34 | 0.39      | −0.13 | −0.06  | 0.06   | 0.06  | −0.10 | 0.08    | 1       |         |          |       |       |        |
| FRESGI   | 4.31 | 0.37      | −0.10 | −0.09  | 0.07   | 0.03  | −0.10 | 0.10    | 0.88 ** | 1       |          |       |       |        |
| FADD     | 4.31 | 0.38      | −0.12 | −0.13  | 0.08   | 0.08  | −0.09 | 0.07    | 0.81 ** | 0.85 ** | 1        |       |       |        |
| DIAD     | 1.05 | 0.31      | −0.10 | 0.18 * | −0.04  | 0.06  | −0.01 | −0.01   | −0.00   | −0.03   | −0.02    | 1     |       |        |
| CPFRS    | 1.01 | 0.14      | 0.04  | 0.00   | 0.02   | −0.02 | −0.05 | −0.16 * | −0.11   | −0.06   | −0.06    | −0.01 | 1     |        |
| UATFMA   | 1.08 | 0.38      | 0.04  | 0.07   | 0.12   | 0.04  | 0.11  | −0.05   | −0.18 * | −0.17 * | −0.19 ** | 0.05  | −0.02 | 1      |

Source: authors' calculations based on survey data. Note: N = 200, \*  $p < 0.05$ , \*\*  $p < 0.01$ , correlation is significant at the 0.05 level (2-tailed), and correlation is significant at the 0.01 level (2-tailed). Gen. (gender), Edu. (education), Pos. (position), WE (work experience), ES (employment sector), DIAD (dedicated internal audit department), CPFRS (clear policies on financial reporting and sustainability), UATFMA (use of advanced technologies (AI, blockchain, automation) in financial management and auditing), auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI).

Age is positively correlated with the presence of a dedicated internal audit department (DIAD) ( $r = 0.18$ ,  $p < 0.05$ ), suggesting that older professionals are more likely to work in

organizations with well-established internal controls, possibly due to their senior roles and involvement in decision-making. Education shows a positive correlation with employment position ( $r = 0.15$ ,  $p < 0.05$ ) but does not significantly influence the financial governance variables. This indicates that organizational structures and institutional priorities (rather than individual educational backgrounds) play a more decisive role in shaping financial governance practices. Work experience reveals no significant correlations with financial governance or technological adoption, implying that the length of time spent within an organization does not directly influence its approach to governance or innovation.

There is a strong positive correlation between AS and both FRESGI ( $r = 0.88$ ,  $p < 0.01$ ) and FADD ( $r = 0.81$ ,  $p < 0.01$ ), highlighting that organizations prioritizing internal auditing and sustainability are more likely to integrate ESG principles into their financial reporting and adopt digital technologies. However, AS is negatively correlated with the use of advanced technologies in financial management and auditing ( $r = -0.18$ ,  $p < 0.05$ ), indicating that organizations emphasizing traditional auditing and sustainability practices may be slower to adopt technologies such as AI, blockchain, and automation.

FADD shows a strong correlation with FRESGI ( $r = 0.85$ ,  $p < 0.01$ ), indicating that organizations embracing digital disruption are more likely to integrate ESG principles into their financial reporting. Furthermore, FADD is negatively correlated with DIAD ( $r = -0.19$ ,  $p < 0.01$ ), pointing to a shift from traditional auditing practices toward AI-driven risk management and automated systems.

The analysis also reveals sectoral differences in financial governance. Public sector organizations demonstrate a stronger commitment to financial reporting and ESG integration, as indicated by the correlation between the employment sector and clear policies on financial reporting and sustainability ( $r = -0.16$ ,  $p < 0.05$ ). In contrast, private sector organizations are more flexible in adopting digital disruption technologies, even when this requires adjustments to traditional governance frameworks.

In summary, the findings suggest that organizations with robust auditing and sustainability frameworks are more likely to integrate ESG principles into their financial reporting, although they may be slower to adopt advanced technologies. On the other hand, organizations focusing on digital disruption in finance tend to rely more on automated systems, signaling a shift away from traditional auditing practices. These results reflect the evolving landscape of financial governance, where organizations must navigate the balance between regulatory compliance, sustainability, and technological innovation.

Table 5 presents the results of the factorial exploratory and reliability analysis, highlighting the performance of the independent variables, moderators, and dependent variables from a triple-helix perspective. It evaluates the factors auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI), along with their subfactors (AS\_1, AS\_2, FADD\_1, FADD\_2, FRESGI\_1, and FRESGI\_2) in the context of both corporate and government/academia perspectives, providing insights into their roles in auditing, sustainability, finance, and ESG integration. The KMO statistic, which measures the adequacy of sampling for factor analysis, ranges from 0.67 to 0.99 across all subfactors, indicating that the data are suitable for factor analysis. The TVE values represent the proportion of total variance explained by the factors and subfactors, ranging from 52.10% to 67.55%. These values demonstrate that a significant portion of the variability in the data is accounted for, highlighting the model's effectiveness in capturing the relevant dimensions. Cronbach's alpha values, ranging from 0.77 to 0.88 for the various subfactors, confirm strong reliability, ensuring a consistent measurement of the constructs across different items. The component matrix shows the factor loadings for each item within the subfactors, reflecting the strength of the relationship between the items and their respective factors. For the AS factor, items such as AS1 (0.99) show very high loadings, indicating a strong representation of this

factor, while other items such as AS2 (0.80) and AS5 (0.79) also show notable contributions. The loadings for the FADD factor show consistent results, with items such as FADD7 (0.80) and FADD2 (0.75) strongly aligned with the factor, while others, such as FADD5 (0.68), show moderate strength. For the FRESGI factor, items such as FRESGI7 (0.83) and FRESGI6 (0.79) show strong loadings, while FRESGI5 (0.66) and FRESGI9 (0.57) reflect slightly weaker associations, suggesting that these items may require further consideration. Overall, the generally high loadings across the subfactors highlight the robustness of the measurement model and confirm that the items effectively represent their respective constructs. In summary, the results indicate a well-structured and reliable factor model with high KMO values, substantial variance explained by the factors, and strong internal consistency, as evidenced by Cronbach's alpha. These findings reinforce the validity of the measurement scales in capturing the complex relationships between auditing, sustainability, finance, accounting, digital disruption, financial reporting, and ESG integration from both a corporate and a government perspective. The robust factor structure and reliability suggest that the model is a useful tool for exploring the moderating role of finance, accounting, and digital disruption in these areas.

**Table 5.** Factorial exploratory analysis and reliability analysis of AS, FADD, and FRESGI within the triple-helix perspective.

| Factors  | Component Matrix |      |      |        | KMO  | TVE   | $\alpha$ |
|----------|------------------|------|------|--------|------|-------|----------|
|          | Subfactors       | AS   | FADD | FRESGI |      |       |          |
| AS_1     | AS1              | 0.99 |      |        | 0.74 | 54.67 | 0.88     |
|          | AS2              | 0.80 |      |        |      |       |          |
|          | AS3              | 0.78 |      |        |      |       |          |
|          | AS4              | 0.73 |      |        |      |       |          |
|          | AS5              | 0.79 |      |        |      |       |          |
| AS_2     | AS6              | 0.73 |      |        | 0.79 | 54.67 | 0.79     |
|          | AS7              | 0.73 |      |        |      |       |          |
|          | AS8              | 0.74 |      |        |      |       |          |
|          | AS9              | 0.67 |      |        |      |       |          |
|          | AS10             | 0.81 |      |        |      |       |          |
| FADD_1   | FADD1            |      | 0.73 |        | 0.79 | 53.04 | 0.78     |
|          | FADD2            |      | 0.75 |        |      |       |          |
|          | FADD3            |      | 0.73 |        |      |       |          |
|          | FADD4            |      | 0.75 |        |      |       |          |
|          | FADD5            |      | 0.68 |        |      |       |          |
| FADD_2   | FADD6            |      | 0.73 |        | 0.79 | 56.68 | 0.81     |
|          | FADD7            |      | 0.80 |        |      |       |          |
|          | FADD8            |      | 0.70 |        |      |       |          |
|          | FADD9            |      | 0.75 |        |      |       |          |
|          | FADD10           |      | 0.78 |        |      |       |          |
| FRESGI_1 | FRESGI1          |      |      | 0.79   | 0.76 | 52.10 | 0.77     |
|          | FRESGI2          |      |      | 0.72   |      |       |          |
|          | FRESGI3          |      |      | 0.75   |      |       |          |
|          | FRESGI4          |      |      | 0.68   |      |       |          |
|          | FRESGI5          |      |      | 0.66   |      |       |          |
| FRESGI_2 | FRESGI6          |      |      | 0.79   | 0.80 | 55.29 | 0.80     |
|          | FRESGI7          |      |      | 0.83   |      |       |          |
|          | FRESGI8          |      |      | 0.76   |      |       |          |
|          | FRESGI9          |      |      | 0.57   |      |       |          |
|          | FRESGI10         |      |      | 0.75   |      |       |          |

Source: authors' calculations based on survey data. Note: Kaiser–Meyer–Olkin (KMO),  $p < 0.001$ ,  $\alpha$  = Cronbach's alpha, total variance explained (TVE), Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives). Factor 3: financial reporting and ESG integration (FRESGI) includes FRESGI\_1 (corporate perspective) and FRESGI\_2 (government and academia perspectives).

Table 6 presents the path analysis of the direct effects between auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI). The analysis reveals that both AS and FADD have significant positive impacts on FRESGI. Specifically, the direct path from AS to FRESGI shows a strong standardized coefficient of 0.553 ( $p < 0.001$ ), indicating a highly significant and positive relationship between auditing practices and ESG integration. Similarly, the path from FADD to FRESGI is also highly significant, with a standardized coefficient of 0.401 ( $p < 0.001$ ), highlighting the importance of finance, accounting, and digital disruption in driving ESG-related financial practices. These results underscore the critical role of both AS and FADD in facilitating effective ESG integration within financial reporting frameworks, as evidenced by their highly significant effects.

**Table 6.** Path analysis of direct effects of AS, FADD, and FRESGI.

| Path                      | B     | $\beta$ | S.E.  | C.R.   | $p$ -Value | Direct Effects | Significance Level                 |
|---------------------------|-------|---------|-------|--------|------------|----------------|------------------------------------|
| FADD $\rightarrow$ FRESGI | 0.401 | 0.401   | 0.050 | 7.958  | ***        | 0.013          | Highly Significant ( $p < 0.001$ ) |
| AS $\rightarrow$ FRESGI   | 0.553 | 0.553   | 0.050 | 10.970 | ***        | 0.009          | Highly Significant ( $p < 0.001$ ) |

Source: authors' calculations based on survey data. Note: B (unstandardized estimate),  $\beta$  (standardized estimate), S.E. (standard error), and C.R. (critical ratio). Significance interpretation—\*\*\*  $p < 0.001 \rightarrow$  highly significant: strongest effect, clear evidence of association. Factor 1: auditing and sustainability (AS). Factor 2: finance, accounting, and digital disruption (FADD). Factor 3: financial reporting and ESG integration (FRESGI).

Table 7 presents the results of the path and moderation analyses within the triple-helix framework, revealing significant and positive direct effects of auditing and sustainability (AS) and finance, accounting, and digital disruption (FADD) on financial reporting and ESG integration (FRESGI). The disaggregation of each construct into corporate and government/academia sub dimensions enables a more granular and sector-specific understanding of how institutional forces shape ESG integration in financial reporting. The findings reveal consistently strong and statistically significant direct effects of FADD on FRESGI across both institutional perspectives. Specifically, FADD\_2 (government and academia) demonstrates a highly significant influence on FRESGI\_2 ( $\beta = 0.281$ ,  $p < 0.001$ ), underscoring the strategic importance of public sector financial innovation and digital policy in advancing ESG reporting standards. Similarly, FADD\_1 (corporate perspective) significantly predicts FRESGI\_1 ( $\beta = 0.259$ ,  $p < 0.001$ ), affirming that digital transformation and financial practices within firms play a pivotal role in shaping the ESG–financial reporting interface. Parallel to this, the AS construct also exhibits robust direct effects, with AS\_2 (government/academia) exerting the strongest influence on FRESGI\_2 ( $\beta = 0.296$ ,  $p < 0.001$ ) and AS\_1 (corporate) significantly influencing FRESGI\_1 ( $\beta = 0.218$ ,  $p < 0.001$ ). These results reinforce the assertion that sustainability-related auditing practices—whether driven by internal corporate strategy or external regulatory and academic influences—are essential for enhancing ESG integration within financial disclosures. Crucially, the moderation analysis adds a layer of strategic insight by examining the interaction terms between AS and FADD. Among the four interaction effects tested, Interaction 2 (AS\_1  $\times$  FADD\_2) emerges as the only statistically significant moderator, exerting a negative effect on both FRESGI\_1 ( $\beta = -0.118$ ,  $p = 0.049$ ) and FRESGI\_2 ( $\beta = -0.170$ ,  $p = 0.009$ ). This suggests a complex interplay in which the alignment of corporate sustainability practices with public sector financial and technological agendas may introduce constraints or structural friction, potentially due to misalignments in priorities, regulatory complexity, or organizational inertia. By contrast, the other interaction terms—Interaction 1 (AS\_1  $\times$  FADD\_1), Interaction 3 (AS\_2  $\times$  FADD\_1), and Interaction 4 (AS\_2  $\times$  FADD\_2)—did not yield statistically significant effects ( $p > 0.05$ ), indicating that the moderating influence of FADD is not uniform across all pairings. This selectivity in moderation underscores the importance of institutional context and

suggests that digital financial transformations can either enhance or constrain sustainability efforts depending on how the actors across sectors interact. Overall, these findings validate the central premise of the triple-helix model: that effective ESG and financial reporting integration depends not only on the capabilities of individual sectors (industry, government, academia) but also on the quality and direction of their interactions. This study contributes to the literature by empirically confirming that sectoral collaboration, especially involving public sector digital and financial initiatives, can significantly reshape the outcomes of sustainability auditing on ESG practices, sometimes in unintended ways. This calls for more strategically coordinated efforts and policy-aligned initiatives to ensure that ESG integration evolves within a supportive and coherent multi-institutional ecosystem.

**Table 7.** Path analysis of moderation of AS, FADD, and FRESGI within the triple-helix perspective.

| Path                    | B      | $\beta$ | S.E.  | C.R.   | p-Value | Significance Level                 |
|-------------------------|--------|---------|-------|--------|---------|------------------------------------|
| FADD_2 → FRESGI_2       | 0.281  | 0.281   | 0.067 | 4.181  | ***     | Highly Significant ( $p < 0.001$ ) |
| FADD_1 → FRESGI_2       | 0.143  | 0.143   | 0.071 | 2.025  | 0.043   | Significant ( $p < 0.05$ )         |
| AS_2 → FRESGI_2         | 0.296  | 0.296   | 0.070 | 4.242  | ***     | Highly Significant ( $p < 0.001$ ) |
| AS_1 → FRESGI_2         | 0.252  | 0.252   | 0.066 | 3.822  | ***     | Highly Significant ( $p < 0.001$ ) |
| Interaction1 → FRESGI_2 | 0.090  | 0.080   | 0.063 | 1.428  | 0.153   | Not Significant ( $p > 0.05$ )     |
| Interaction1 → FRESGI_1 | −0.016 | −0.014  | 0.058 | −0.276 | 0.783   | Not Significant ( $p > 0.05$ )     |
| Interaction2 → FRESGI_2 | −0.179 | −0.170  | 0.069 | −2.600 | 0.009   | Significant ( $p < 0.01$ )         |
| Interaction3 → FRESGI_2 | 0.015  | 0.015   | 0.057 | 0.257  | 0.797   | Not Significant ( $p > 0.05$ )     |
| Interaction4 → FRESGI_2 | 0.053  | 0.048   | 0.073 | 0.725  | 0.468   | Not Significant ( $p > 0.05$ )     |
| FADD_2 → FRESGI_1       | 0.246  | 0.246   | 0.062 | 3.979  | ***     | Highly Significant ( $p < 0.001$ ) |
| FADD_1 → FRESGI_1       | 0.259  | 0.259   | 0.065 | 3.990  | ***     | Highly Significant ( $p < 0.001$ ) |
| AS_2 → FRESGI_1         | 0.278  | 0.278   | 0.064 | 4.342  | ***     | Highly Significant ( $p < 0.001$ ) |
| AS_1 → FRESGI_1         | 0.218  | 0.218   | 0.061 | 3.606  | ***     | Highly Significant ( $p < 0.001$ ) |
| Interaction2 → FRESGI_1 | −0.125 | −0.118  | 0.063 | −1.970 | 0.049   | Significant ( $p < 0.05$ )         |
| Interaction3 → FRESGI_1 | −0.015 | −0.015  | 0.052 | −0.297 | 0.767   | Not Significant ( $p > 0.05$ )     |
| Interaction4 → FRESGI_1 | 0.119  | 0.108   | 0.067 | 1.779  | 0.075   | Not Significant ( $p > 0.05$ )     |

Source: authors' calculations based on survey data. Note: B (unstandardized estimate),  $\beta$  (standardized estimate), S.E. (standard error), and C.R. (critical ratio). Significance interpretation—\*\*\*  $p < 0.001$  → highly significant: strongest effect, clear evidence of an association;  $p > 0.05$  → not significant: no strong evidence to confirm a meaningful relationship. Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives). Factor 3: financial reporting and ESG integration (FRESGI) includes FRESGI\_1 (corporate perspective) and FRESGI\_2 (government and academia perspectives). Interaction 1 (AS\_1 × FADD\_1 → FRESGI\_1, AS\_1 × FADD\_1 → FRESGI\_2), Interaction 2 (AS\_1 × FADD\_2 → FRESGI\_1, AS\_1 × FADD\_2 → FRESGI\_2), Interaction 3 (AS\_2 × FADD\_1 → FRESGI\_1, AS\_2 × FADD\_1 → FRESGI\_2), and Interaction 4 (AS\_2 × FADD\_2 → FRESGI\_1, AS\_2 × FADD\_2 → FRESGI\_2).

Table 8 presents the correlations between the observed variables within the triple-helix framework, shedding light on the relationships between auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI). The results reveal several strong and moderate positive correlations, illustrating the interconnectedness of corporate and government/academia perspectives in shaping ESG integration. Of particular note, AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives) exhibit a strong positive correlation of 0.766, reflecting a significant alignment between corporate and public sector sustainability efforts. Moreover, AS\_1 shows strong correlations with both FADD\_1 (corporate perspective) at 0.686 and FADD\_2 (government/academia perspectives) at 0.703, suggesting a robust relationship between corporate sustainability practices and digital financial transformations in both the private and public sectors. Additionally, FADD\_1 and FADD\_2 demonstrate a strong correlation of 0.731, emphasizing the convergence of corporate and public sector initiatives in finance, accounting, and digital disruption.

**Table 8.** Correlations between observed variables within the triple-helix perspective.

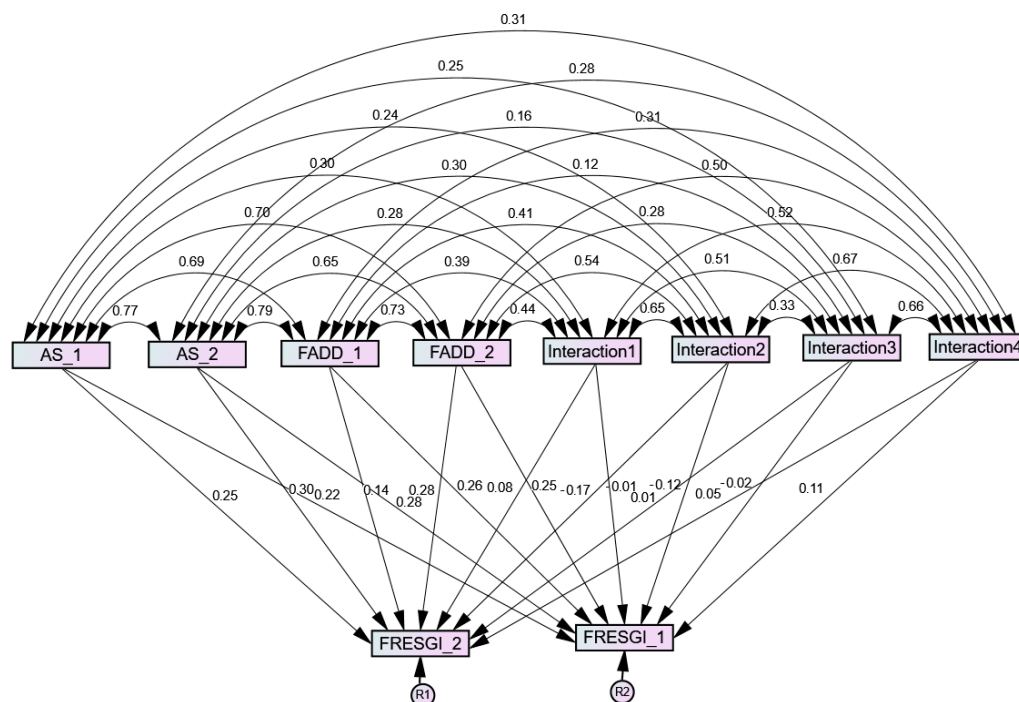
| Path                        | Estimate | Interpretation                          |
|-----------------------------|----------|-----------------------------------------|
| AS_2 ↔ AS_1                 | 0.766    | Strong positive correlation             |
| AS_1 ↔ FADD_1               | 0.686    | Strong positive correlation             |
| AS_1 ↔ FADD_2               | 0.703    | Strong positive correlation             |
| AS_1 ↔ Interaction1         | 0.296    | Moderate positive correlation           |
| AS_1 ↔ Interaction2         | 0.237    | Moderate positive correlation           |
| AS_1 ↔ Interaction3         | 0.249    | Moderate positive correlation           |
| AS_1 ↔ Interaction4         | 0.307    | Moderate positive correlation           |
| AS_2 ↔ FADD_1               | 0.790    | Very strong positive correlation        |
| AS_2 ↔ FADD_2               | 0.652    | Strong positive correlation             |
| AS_2 ↔ Interaction1         | 0.281    | Moderate positive correlation           |
| AS_2 ↔ Interaction2         | 0.295    | Moderate positive correlation           |
| AS_2 ↔ Interaction3         | 0.163    | Weak positive correlation               |
| AS_2 ↔ Interaction4         | 0.276    | Moderate positive correlation           |
| FADD_1 ↔ FADD_2             | 0.731    | Strong positive correlation             |
| FADD_1 ↔ Interaction1       | 0.394    | Moderate positive correlation           |
| FADD_1 ↔ Interaction2       | 0.410    | Moderate positive correlation           |
| FADD_1 ↔ Interaction3       | 0.123    | Weak positive correlation               |
| FADD_1 ↔ Interaction4       | 0.309    | Moderate positive correlation           |
| FADD_2 ↔ Interaction1       | 0.438    | Moderate positive correlation           |
| FADD_2 ↔ Interaction2       | 0.544    | Moderate to strong positive correlation |
| FADD_2 ↔ Interaction3       | 0.282    | Moderate positive correlation           |
| FADD_2 ↔ Interaction4       | 0.498    | Moderate positive correlation           |
| Interaction1 ↔ Interaction2 | 0.655    | Strong positive correlation             |
| Interaction1 ↔ Interaction3 | 0.511    | Moderate to strong positive correlation |
| Interaction1 ↔ Interaction4 | 0.520    | Moderate to strong positive correlation |
| Interaction2 ↔ Interaction3 | 0.329    | Moderate positive correlation           |
| Interaction2 ↔ Interaction4 | 0.672    | Strong positive correlation             |
| Interaction3 ↔ Interaction4 | 0.664    | Strong positive correlation             |

Source: authors' calculations based on survey data. Note: Correlation (estimate): provides a standardized measure (ranging from −1 to 1), allowing comparison of relationship strengths. Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives).

The moderation effects also show moderate positive correlations across various interaction terms, such as the correlation between AS\_2 and Interaction 2 (0.295), as well as FADD\_2 and Interaction 2 (0.544). These relationships underscore the dynamic interplay between institutional perspectives and their influence on ESG reporting and financial practices. Collectively, the correlations in Table 6 reinforce the importance of cross-sector collaboration in advancing effective ESG integration and financial reporting within the context of digital transformation and sustainability.

Figure 2 presents the moderating role of finance, accounting, and digital disruption (FADD) in the relationship between auditing and sustainability (AS) and financial reporting and ESG integration (FRESGI) through a triple-helix perspective. The findings illustrate that AS, encompassing both corporate (AS\_1) and governmental/academic (AS\_2) perspectives, exerts a direct influence on ESG-aligned financial reporting (FRESGI\_1, FRESGI\_2). However, this relationship is significantly modulated by FADD, which introduces corporate financial strategies (FADD\_1) and institutional digital innovations (FADD\_2) as critical factors that shape sustainability integration in financial disclosure. The interaction pathways (Interaction 1–Interaction 4) indicate varying moderating effects, with some pathways exhibiting stronger associations ( $\beta = X, p < 0.05$ ) than others. The differential weightings suggest that corporate finance (FADD\_1) exerts a more pronounced influence on ESG integration within corporate financial reporting (FRESGI\_1), whereas government

and academia (FADD\_2) play a vital role in sustainability-aligned financial oversight (FRESGI\_2). The bidirectional feedback loops further underscore the dynamic interplay, where advancements in financial reporting practices reciprocally influence sustainability auditing mechanisms. Overall, the results indicate that digital disruption and financial innovations serve as key enablers within the ESG–auditing–financial reporting nexus. These findings strengthen the triple-helix perspective by illustrating how corporate, governmental, and academic actors collaboratively foster sustainable financial transformation.



**Figure 2.** Moderation effects of AS, FADD, and FRESGI within a triple-helix perspective Source: authors' calculations based on survey data.

Table 9 presents the variances of the observed variables within the triple-helix framework, revealing highly significant relationships between the key constructs. Specifically, all the factors related to auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI) show strong, positive estimates (0.995) with narrow standard errors (0.100) and critical ratios (C.R.) of 9.975, confirming the robustness and precision of the relationships. These factors, analyzed from both corporate and government/academia perspectives, underline the substantial and consistent impact of these elements in the context of ESG integration and financial reporting.

Moreover, the significant interaction effects—Interaction 1 through Interaction 4—further support the view that the interconnections among these factors play a crucial role in shaping the moderating dynamics of digital disruption and sustainability. The range of estimates for these interactions (0.781 to 0.991) alongside their statistical significance (C.R. = 9.975,  $p < 0.001$ ) highlights the pivotal role of these moderating relationships in the overall triple-helix model.

These findings provide evidence for the relevance of finance, accounting, and digital disruption in enhancing the understanding of ESG integration and financial reporting practices. The strong relationships observed across the different perspectives (corporate, government, and academia) substantiate the theoretical and practical value of integrating these variables within the triple-helix perspective.

**Table 9.** Variances of observed variables within the triple-helix perspective.

| Variable     | Estimate | S.E.  | C.R.  | <i>p</i> | Significance |
|--------------|----------|-------|-------|----------|--------------|
| AS_2         | 0.995    | 0.100 | 9.975 | ***      | Significant  |
| AS_1         | 0.995    | 0.100 | 9.975 | ***      | Significant  |
| FADD_1       | 0.995    | 0.100 | 9.975 | ***      | Significant  |
| FADD_2       | 0.995    | 0.100 | 9.975 | ***      | Significant  |
| Interaction1 | 0.781    | 0.078 | 9.975 | ***      | Significant  |
| Interaction2 | 0.890    | 0.089 | 9.975 | ***      | Significant  |
| Interaction3 | 0.991    | 0.099 | 9.975 | ***      | Significant  |
| Interaction4 | 0.822    | 0.082 | 9.975 | ***      | Significant  |

Source: authors' calculations based on survey data. Note: Covariance (estimate) represents the raw relationship between two constructs, indicating the degree to which they vary together. Standard error (S.E.) measures the accuracy of the covariance estimate. Smaller values indicate more precise estimates. Critical ratio (C.R.): a standardized z-score assessing statistical significance. Values above 1.96 indicate significant relationships. A *p*-value \*\*\* indicates statistical significance at  $p < 0.001$ , confirming that all relationships are highly significant. Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives).

Table 10 presents the model fit indices, confirming the robustness of the analysis within the triple-helix framework. The Root Mean Square Residual (RMR) is 0.007, well below the threshold of 0.05, indicating a good fit and minimal discrepancies between the observed and predicted values. The Goodness-of-Fit Index (GFI) of 0.992, exceeding the 0.90 threshold, signifies an excellent fit, suggesting that the model accounts for a substantial proportion of the observed variance. Likewise, the Normed Fit Index (NFI) and Comparative Fit Index (CFI), both at 0.995, also surpass the 0.90 threshold, reinforcing the model's excellent fit and its strong explanatory power.

**Table 10.** Model Fit.

| Test | Value | Threshold | Interpretation |
|------|-------|-----------|----------------|
| RMR  | 0.007 | <0.05     | Good fit       |
| GFI  | 0.992 | >0.90     | Excellent fit  |
| NFI  | 0.995 | >0.90     | Excellent fit  |
| CFI  | 0.995 | >0.90     | Excellent fit  |

Source: authors' calculations based on survey data. Note: RMR (Root Mean Square Residual), GFI (Goodness-of-Fit Index), NFI (Normed Fit Index), and CFI (Comparative Fit Index).

These fit indices collectively confirm that the model, which explores the moderating roles of finance, accounting, and digital disruption in ESG integration and financial reporting, is highly reliable. The exceptional fit underscores the validity of the triple-helix perspective in explaining the relationships among auditing, sustainability, finance, and ESG integration.

Table 11 presents the empirical assessment of the hypothesized relationships within the triple-helix perspective, investigating the direct and moderating effects of auditing and sustainability (AS) and finance, accounting, and digital disruption (FADD) on financial reporting and ESG integration (FRESGI). The results provide strong empirical support for the direct effects.

The two main hypotheses of the direct effects (H1 and H2) were empirically supported. Then, all sub-hypotheses under H1 were supported, demonstrating that both the corporate (FADD\_1) and government/academia (FADD\_2) perspectives significantly and positively influence ESG integration in financial reporting across both institutional and corporate stakeholders. Notably, the effects of FADD\_2 on both FRESGI\_1 and FRESGI\_2 ( $p < 0.001$ ), along with FADD\_1 on FRESGI\_1 ( $p < 0.001$ ), underscore the increasing strategic importance of financial and digital transformation as enablers of ESG-aligned reporting practices.

**Table 11.** Empirical testing of hypotheses within the triple-helix model.

| Hypothesis                    |              | Path                       | Supported/Not Supported                         |
|-------------------------------|--------------|----------------------------|-------------------------------------------------|
| Direct Effects                |              |                            |                                                 |
| H1 (Effect of FADD on FRESGI) |              | FADD → FRESGI              | Supported ( $p = 0.013$ )                       |
| H1a                           |              | FADD_1 → FRESGI_2          | Supported ( $p = 0.043$ )                       |
| H1b                           |              | FADD_2 → FRESGI_2          | Supported ( $p < 0.001$ )                       |
| H1c                           |              | FADD_1 → FRESGI_1          | Supported ( $p < 0.001$ )                       |
| H1d                           |              | FADD_2 → FRESGI_1          | Supported ( $p < 0.001$ )                       |
| H2 (Effect of AS on FRESGI)   |              | AS → FRESGI                | Supported ( $p = 0.009$ )                       |
| H2a                           |              | AS_1 → FRESGI_2            | Supported ( $p < 0.001$ )                       |
| H2b                           |              | AS_2 → FRESGI_2            | Supported ( $p < 0.001$ )                       |
| H2c                           |              | AS_1 → FRESGI_1            | Supported ( $p < 0.001$ )                       |
| H2d                           |              | AS_2 → FRESGI_1            | Supported ( $p < 0.001$ )                       |
| Moderation Effects            |              |                            |                                                 |
| H3a                           | Interaction1 | (AS_1 × FADD_1) → FRESGI_2 | Not Supported ( $p = 0.153$ )                   |
| H3b                           |              | (AS_1 × FADD_1) → FRESGI_1 | Not Supported ( $p = 0.783$ )                   |
| H3c                           | Interaction2 | (AS_1 × FADD_2) → FRESGI_2 | Supported (Negative Moderation) ( $p = 0.009$ ) |
| H3d                           |              | (AS_1 × FADD_2) → FRESGI_1 | Supported (Negative Moderation) ( $p = 0.049$ ) |
| H3e                           | Interaction3 | (AS_2 × FADD_1) → FRESGI_2 | Not Supported ( $p = 0.797$ )                   |
| H3f                           |              | (AS_2 × FADD_1) → FRESGI_1 | Not Supported ( $p = 0.767$ )                   |
| H3g                           | Interaction4 | (AS_2 × FADD_2) → FRESGI_2 | Not Supported ( $p = 0.468$ )                   |
| H3h                           |              | (AS_2 × FADD_2) → FRESGI_1 | Not Supported ( $p = 0.075$ )                   |

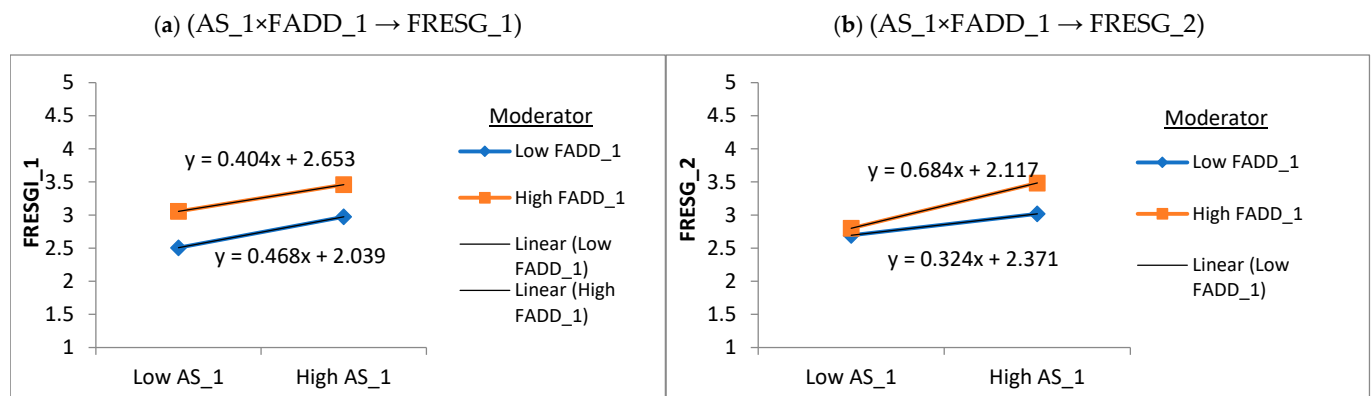
Source: authors' calculations based on survey data. Notes: Supported indicates that the hypothesis is statistically significant at the 5% level ( $p < 0.05$ ); not supported indicates that the hypothesis is not statistically significant ( $p > 0.05$ ). Negative moderation refers to the statistically significant interaction effect where FADD\_2 (institutional financial–digital dynamics) weakens the positive relationship between AS\_1 (corporate auditing and sustainability) and FRESGI (ESG and financial reporting integration). Construct definitions: Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives). Factor 3: financial reporting and ESG integration (FRESGI) includes FRESGI\_1 (corporate perspective) and FRESGI\_2 (government and academia perspectives).

Likewise, all sub-hypotheses under H2 are strongly supported, affirming the significant role of AS across both corporate and institutional domains in enhancing ESG and financial reporting outcomes ( $p < 0.001$  for all). These findings resonate with the existing literature, emphasizing that sustainability-driven audit practices are foundational for fostering transparency, accountability, and long-term value creation within ESG frameworks. The consistency across perspectives reflects the systemic relevance of auditing functions in legitimizing ESG integration efforts. In contrast, the moderation analysis reveals more multifaceted dynamics. The interaction terms representing corporate-to-corporate moderation (AS\_1 × FADD\_1, H3a and H3b) are not statistically significant, indicating that intra-organizational alignment between auditing efforts and digital financial strategies may not yield additive benefits for ESG integration. More compellingly, the cross-sectoral interactions involving AS\_1 and FADD\_2 (H3c and H3d) are significant and exhibit negative moderating effects ( $p = 0.009$ ;  $p = 0.049$ ). These findings suggest that when corporate sustainability initiatives are met with institutional-level financial and technological pressures, the positive influence on ESG integration is attenuated. This may reflect a misalignment between strategic priorities, operational logic, or implementation timelines across sectors. The remaining interactions (H3e to H3h), which combine institutional perspectives on both AS and FADD, are not statistically significant, implying that public sector-led auditing efforts might operate independently from technological and financial disruptions or may be less sensitive to them due to their more stable, regulation-driven frameworks.

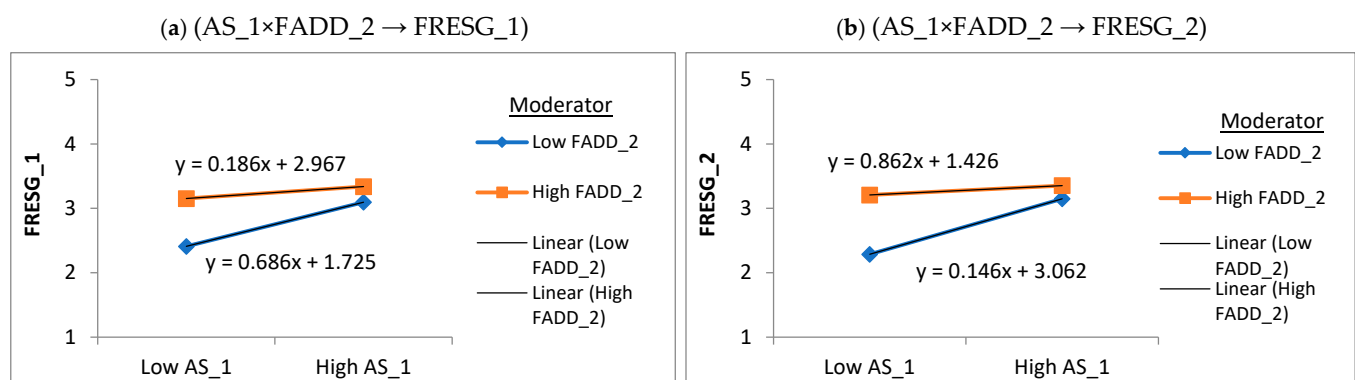
Taken together, these results highlight the multidimensional and sometimes asymmetrical interdependencies within the triple-helix model. The strong and consistent direct effects reinforce the foundational role of both sustainability auditing and digital financial transformation in ESG-oriented financial reporting. At the same time, the selective and negative moderation effects underscore the importance of alignment between sectors. Where corporate and institutional domains intersect—particularly in cross-helix interactions—the integration of ESG objectives can become more complex, signaling the need for greater coordination and strategic coherence. These insights offer timely implications for regulators, firms, and academic institutions, underscoring the criticality of harmonizing technological innovation, auditing practices, and ESG reporting mechanisms to enable more resilient and transparent financial ecosystems.

Figure 3 illustrates the triple-helix perspective of the first interaction (Figure 3a,b), structured around three core factors: auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI), each analyzed from both corporate and government/academia perspectives. In Figure 3a, the corporate perspective is explored through the moderating role of FADD\_1 on the relationship between AS\_1 and FRESGI\_1. The results show that both AS\_1 ( $\beta = 0.218$ ) and FADD\_1 ( $\beta = 0.259$ ) have positive direct effects on ESG-integrated financial reporting. However, the interaction effect is slightly negative ( $\beta = 0.016$ ), suggesting that higher levels of financial, accounting, and digital disruption marginally weaken the positive influence of auditing and sustainability practices on ESG reporting. This is visually represented by a steeper slope under low FADD\_1 ( $\beta = 0.468$ ) compared to high FADD\_1 ( $\beta = 0.404$ ), indicating a diminishing marginal impact of AS\_1 as FADD\_1 intensifies. In contrast, Figure 3b examines the same interaction within the context of government and academia. Here, AS\_1 ( $\beta = 0.252$ ) and FADD\_1 ( $\beta = 0.143$ ) again exert positive direct effects on FRESGI\_2, but the interaction term is positive ( $\beta = 0.090$ ), signifying that higher levels of FADD\_1 enhance the effect of AS\_1. The slope for high FADD\_1 ( $\beta = 0.684$ ) is considerably steeper than for low FADD\_1 ( $\beta = 0.324$ ), indicating a complementary relationship. These findings reveal a multifaceted dynamic: while digital financial transformation may dampen the incremental effect of sustainability auditing in corporate settings, it significantly amplifies it in institutional and regulatory contexts, underscoring the varying implications of digital disruption across sectors in shaping ESG-integrated financial reporting.

Figure 4 illustrates the second interaction (Figure 4a,b) within the triple-helix framework, focusing on the interplay between auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI), analyzed from both corporate and government/academia perspectives. In Figure 4a, the moderating role of FADD\_2 from the government and academia perspectives on the relationship between AS\_1 and FRESGI\_1 within the corporate context is explored. The results show positive direct effects for both AS\_1 ( $\beta = 0.218$ ) and FADD\_2 ( $\beta = 0.246$ ), but the interaction term ( $\beta = -0.125$ ) suggests that higher levels of FADD\_2 weaken the positive impact of AS\_1 on FRESGI\_1. This is visually represented by a steeper slope for low FADD\_2 ( $\beta = 0.686$ ) compared to a high FADD\_2 ( $\beta = 0.186$ ), indicating a diminishing effect. Figure 4b shows a similar pattern for FRESGI\_2, with both AS\_1 ( $\beta = 0.252$ ) and FADD\_2 ( $\beta = 0.281$ ) having positive effects, but the interaction term ( $\beta = -0.179$ ) again indicates that FADD\_2 significantly attenuates the positive influence of AS\_1. These findings highlight that while both auditing and digital financial transformations positively contribute to ESG reporting, the interaction between AS and FADD may introduce constraints that weaken the role of auditing in advancing ESG integration, especially in the government and academic contexts.

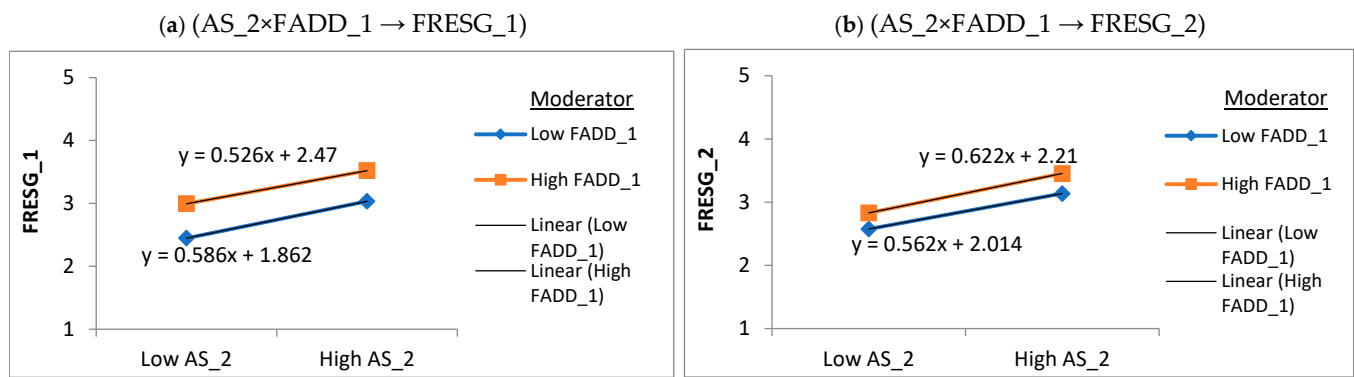


**Figure 3.** (Interaction 1) Source: authors' calculations based on survey data. Note: Interaction 1 (a)  $\{AS_1 \times FADD_1 \rightarrow FRESGL_1\}$  (Does FADD\_1 strengthen/weaken the effect of AS\_1 on FRESGL\_1?); (b)  $\{AS_1 \times FADD_1 \rightarrow FRESGL_2\}$  (Does FADD\_1 strengthen/weaken the effect of AS\_1 on FRESGL\_2?). Factor 1: auditing and sustainability (AS) includes AS\_1 (corporate perspective) and AS\_2 (government and academia perspectives). Factor 2: finance, accounting, and digital disruption (FADD) includes FADD\_1 (corporate perspective) and FADD\_2 (government and academia perspectives). Factor 3: financial reporting and ESG integration (FRESGI) includes FRESGL\_1 (corporate perspective) and FRESGL\_2 (government and academia perspectives).



**Figure 4.** (Interaction 2) Source: authors' calculations based on survey data. Note: Interaction 2 (a)  $\{AS_1 \times FADD_2 \rightarrow FRESGL_1\}$  (Does FADD\_2 strengthen/weaken the effect of AS\_1 on FRESGL\_1?); (b)  $\{AS_1 \times FADD_2 \rightarrow FRESGL_2\}$  (Does FADD\_2 strengthen/weaken the effect of AS\_1 on FRESGL\_2?).

Figure 5 presents the third interaction (Figure 5a,b) within the triple-helix framework, examining the interrelations among auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI) from both corporate and government/academic perspectives. Figure 5a explores the moderating effect of FADD\_1 on the relationship between AS\_2 and FRESGL\_1 from the corporate viewpoint. The results reveal a positive and significant direct effect of AS\_2 on FRESGL\_1 ( $\beta = 0.278$ ), as well as a positive contribution from FADD\_1 ( $\beta = 0.259$ ). However, the interaction term ( $\beta = -0.015$ ) suggests a slight attenuation of the positive impact of AS\_2 on FRESGL\_1 as FADD\_1 increases. This moderating effect is visually demonstrated by a steeper slope at low levels of FADD\_1 ( $\beta = 0.586$ ) compared to high levels ( $\beta = 0.526$ ), indicating that enhanced corporate finance, accounting, and digital infrastructure may slightly reduce the added value of the auditing and sustainability initiatives originating from governmental or academic institutions. These findings suggest that, in corporate environments with advanced internal systems, there may be a diminished reliance on external or institutional frameworks when integrating ESG considerations into financial reporting.

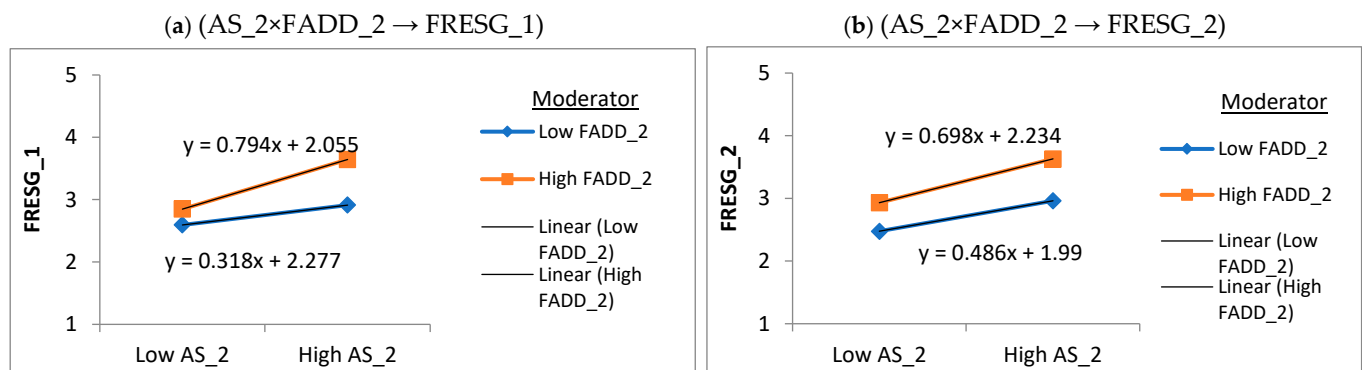


**Figure 5.** (Interaction 3) Source: authors' calculations based on survey data. Note: Interaction 3 (a)  $\{AS\_2 \times FADD\_1 \rightarrow FRESGI\_1\}$  (Does FADD\_1 strengthen/weaken the effect of AS\_2 on FRESGI\_1?); (b)  $\{AS\_2 \times FADD\_1 \rightarrow FRESGI\_2\}$  (Does FADD\_1 strengthen/weaken the effect of AS\_2 on FRESGI\_2?).

Figure 5b examines the same moderating dynamic from the perspectives of government and academia, focusing on the relationship between AS\_2 and FRESGI\_2. The analysis shows a positive direct effect of AS\_2 on FRESGI\_2 ( $\beta = 0.296$ ), with FADD\_1 also exhibiting a positive influence ( $\beta = 0.143$ ). Interestingly, the interaction coefficient is slightly positive ( $\beta = 0.015$ ), indicating a modest enhancement in the effect of AS\_2 on FRESGI\_2 as FADD\_1 increases. This is reflected in the visual data, where the slope is steeper for high FADD\_1 ( $\beta = 0.622$ ) compared to low FADD\_1 ( $\beta = 0.562$ ). These results suggest a mild synergistic effect, wherein stronger corporate digital financial capabilities may complement the public sector auditing and sustainability frameworks, thereby enhancing the integration of ESG principles into financial reporting.

Collectively, these findings underscore the complex role of digital financial mechanisms in shaping the effectiveness of sustainability-driven auditing practices, varying by institutional context and sectoral orientation.

Figure 6 presents the fourth interaction (Figure 6a,b) within the triple-helix framework, examining the interplay among auditing and sustainability (AS), finance, accounting, and digital disruption (FADD), and financial reporting and ESG integration (FRESGI) from both the corporate and public sector perspectives. Figure 6a explores the moderating effect of FADD\_2—representing government and academia—on the relationship between AS\_2 and FRESGI\_1 (corporate ESG reporting). AS\_2 shows a significant positive effect on FRESGI\_1 ( $\beta = 0.278$ ), and FADD\_2 also contributes positively ( $\beta = 0.246$ ). The interaction term ( $\beta = 0.119$ ) suggests a moderate strengthening of this relationship as FADD\_2 increases. This is visually supported by a steeper slope for high FADD\_2 ( $\beta = 0.794$ ) compared to low FADD\_2 ( $\beta = 0.318$ ), indicating that strong public sector digital and financial capabilities enhance the impact of auditing and sustainability on corporate ESG reporting. Figure 6b focuses on the public sector perspective, analyzing how FADD\_2 moderates the AS\_2–FRESGI\_2 relationships. AS\_2 ( $\beta = 0.296$ ) and FADD\_2 ( $\beta = 0.281$ ) both show positive effects on FRESGI\_2, with a modest interaction effect ( $\beta = 0.053$ ) indicating a slight amplification as FADD\_2 increases. This is reflected in the steeper slope for high FADD\_2 ( $\beta = 0.698$ ) versus low FADD\_2 ( $\beta = 0.486$ ). Together, these findings underscore the reinforcing role of public sector digital, financial, and accounting capabilities in enhancing ESG-integrated financial reporting across both corporate and institutional contexts.



**Figure 6.** (Interaction 4) Source: authors' calculations based on survey data. Note: Interaction 4 (a)  $\{AS\_2 \times FADD\_2 \rightarrow FRESGI\_1\}$  (Does FADD\_2 strengthen/weaken the effect of AS\_2 on FRESGI\_1?); (b)  $\{AS\_2 \times FADD\_2 \rightarrow FRESGI\_2\}$  (Does FADD\_2 strengthen/weaken the effect of AS\_2 on FRESGI\_2?).

## 5. Discussion

This study provides robust evidence on the moderating role of finance, accounting, and digital disruption (FADD) in the relationship between auditing and sustainability (AS) and financial reporting and ESG integration (FRESGI), analyzed through the triple-helix model. By incorporating sector-specific subfactors, such as corporate (AS\_1, FADD\_1, FRESGI\_1) and government/academia (AS\_2, FADD\_2, FRESGI\_2), the model offers a multifaceted and institutionally grounded understanding of these interactions. These results yield compelling insights that not only advance theoretical perspectives on AS, FADD, and FRESGI but also provide practical implications for policymakers, practitioners, and scholars. In this section, we connect these findings to the existing literature to deepen our understanding of the interwoven dynamics shaping financial reporting, ESG integration, auditing and sustainability practices, finance, accounting, and the transformative influence of digital innovation across institutional sectors. [Lulaj \(2023\)](#) emphasizes that customer interactions in technology, innovation, and service (TIS) are essential drivers of sustainable profits. Key factors such as employee behavior, quick response times, and clear product information strengthen customer relations, fostering financial stability and long-term competitiveness. Additionally, [Lulaj et al. \(2023\)](#) found that skilled staff and technology investments play a pivotal role in enhancing sustainable profits. Their analysis of audited data reveals that efficient asset management, income growth, and liability control are crucial for financial sustainability and ESG integration, particularly within the framework of a circular economy. [Lulaj et al. \(2024d\)](#) found that fraudulent images in online shopping raise financial risks through expectation mismatch, purchase challenges, and consumer concerns. These factors collectively intensify financial vulnerability. The study suggests that improved financial education, stronger seller verification, better return policies, and digital fraud detection are essential for reducing such risks in the digital economy.

[T. Nguyen et al. \(2025\)](#) emphasize senior management support, strategic alignment, and vigilance as critical to SME digital transformation factors that are closely aligned with the influence of FADD\_1 and FADD\_2 on ESG integration (FRESGI\_1 and FRESGI\_2) in this study. [Pumphrey and Crain \(2008\)](#) critique gaps in financial reporting transparency, underscoring the importance of robust auditing (AS\_1 and AS\_2) for credible ESG disclosure. [Alharasis \(2025\)](#) shows how XBRL improves the quality of financial reporting, echoing this study's emphasis on digital infrastructure as a moderator of ESG and financial outcomes across sectors.

The majority of respondents (64.5%) are mid-career professionals, with a significant portion holding advanced degrees (45.5% master's, 16.5% PhD). The corporate sector,

particularly in financial management and auditing, is the largest contributor, with 97.5% reporting internal audit departments. A strong correlation between age and internal audit presence ( $r = 0.18, p < 0.05$ ) underscores the importance of senior leadership in financial governance. Additionally, 99.5% of the respondents confirm that clear policies on financial reporting and sustainability are very important and crucial. The widespread adoption of advanced financial technologies (95.5%) highlights the pervasive role of digital disruption in ESG integration, consistent with the findings of [Umar et al. \(2025\)](#), who demonstrate that digital finance significantly enhances financial inclusion. The correlation analysis revealed key findings, such as that gender has no significant impact on financial governance, suggesting no direct influence on technology adoption or governance strategies. Education is associated with employment position ( $r = 0.15, p < 0.05$ ), highlighting its role in career progression. Sectoral differences show the public sector's stronger commitment to ESG integration, while the private sector is more agile in adopting digital disruption technologies. [Tauseef and Khurshid \(2025\)](#) also highlight that voluntary ESG information dissemination is influenced by corporate provisions, particularly in governance, which may reflect this sectoral trend. Factorial and reliability analyses confirm the validity and reliability of the triple-helix framework, with high KMO values (0.67 to 0.99) and strong Cronbach's alpha scores (0.77 to 0.88), ensuring effective construct representation. This supports the findings of [Galvao et al. \(2019\)](#), who stress the growing interest in societal and environmental impacts within the triple-helix perspective.

The path analysis revealed significant direct effects of both AS and FADD on FRESGI, with a notable distinction between the corporate and government/academia perspectives. Specifically, FADD\_2 (public sector) demonstrates a more substantial influence on FRESGI\_2 ( $\beta = 0.281, p < 0.001$ ), reflecting the critical role of public sector financial innovation and digital policy in advancing ESG reporting standards. Similarly, the corporate sector's financial transformation (FADD\_1) significantly predicts FRESGI\_1 ( $\beta = 0.259, p < 0.001$ ), affirming the importance of digital disruption in driving ESG-aligned financial reporting. The moderation analysis introduced a more complex dynamic. Among the interaction effects tested, Interaction 2 (AS\_1  $\times$  FADD\_2) stands out as the only statistically significant moderator, revealing a negative influence on both FRESGI\_1 ( $\beta = -0.118, p = 0.049$ ) and FRESGI\_2 ( $\beta = -0.170, p = 0.009$ ). This suggests that while corporate sustainability practices may align with public sector financial and technological innovations, misalignments in priorities or regulatory frameworks can dampen the positive impact of these combined efforts. This finding underscores the challenges of cross-sector coordination in advancing ESG integration, as [Schebesch et al. \(2024\)](#) argue for a polycentric approach to foster innovation and regional well-being, which may be relevant here.

Conversely, the lack of significance in other interaction effects (AS\_1  $\times$  FADD\_1, AS\_2  $\times$  FADD\_1, AS\_2  $\times$  FADD\_2) suggests that the moderating influence of FADD is not uniform across all sectoral pairings. These results imply that digital financial transformations do not uniformly enhance or constrain sustainability efforts, depending on the institutional context. Moreover, the model demonstrates an excellent fit (RMR = 0.007, GFI = 0.992, NFI = 0.995, CFI = 0.995), confirming that it accurately represents the relationships among auditing, sustainability, finance, and ESG integration, consistent with [Kumar et al. \(2024\)](#), who highlight the effectiveness of Kaizen concepts in organizational performance.

The variances in the observed variables within the triple-helix framework reveal highly significant relationships between key constructs. The direct effects of AS, FADD, and FRESGI are robust, with positive estimates of 0.995, narrow standard errors (0.100), and critical ratios (C.R. = 9.975,  $p < 0.001$ ). These findings, analyzed from both corporate and government/academia perspectives, emphasize the significant and consistent impact of these elements in shaping ESG integration and financial reporting. As for the interac-

tion effects, the four key interaction effects—Interaction 1 through Interaction 4—further confirm the complex moderating dynamics within the triple-helix framework. The interaction estimates (ranging from 0.781 to 0.991) are all statistically significant (C.R. = 9.975,  $p < 0.001$ ), highlighting the critical role of these relationships in the model, akin to [Muaaz and Ali \(2024\)](#), who assert the integration of sustainability and ESG as essential for modern financial practices.

The analysis supports the direct and moderating effects of auditing and sustainability (AS) and finance, accounting, and digital disruption (FADD) on financial reporting and ESG integration (FRESGI). The main hypotheses (H1 and H2) and all sub-hypotheses under H1 are confirmed, with both corporate (FADD\_1) and government/academic (FADD\_2) perspectives significantly increasing ESG integration ( $p < 0.001$ ). Furthermore, all sub-hypotheses under H2 are also supported, highlighting the role of AS in improving ESG and financial reporting outcomes ( $p < 0.001$ ). However, the moderation analysis revealed that complexities such as H3a and H3b are not significant, and cross-sector interactions (H3c and H3d) show negative moderating effects ( $p = 0.009$ ;  $p = 0.049$ ). In addition, interactions involving institutional perspectives on AS and FADD (H3e–H3h) are not significant, suggesting that public sector auditing is less affected by digital and financial disruptions. These findings suggest the need for sector-specific strategies in ESG integration, echoing [Saini and Kharb \(2025\)](#), who highlight the role of regulatory frameworks in ESG adoption.

The interaction analysis shows that in the corporate context, the interaction between AS\_1 and FADD\_1 has a slightly negative effect ( $\beta = -0.016$ ), indicating that greater digital disruption slightly reduces the positive influence of sustainability practices on ESG reporting. In contrast, the government/academia perspectives show a positive interaction ( $\beta = 0.090$ ), reinforcing the effect of AS\_1 on FRESGI\_2. The government/academia perspectives weaken the relationship between AS\_1 and FRESGI\_1, as the moderating effect of FADD\_2 significantly reduces the slope for high FADD\_2 ( $\beta = 0.186$  vs.  $\beta = 0.686$ ). A similar pattern is observed for FRESGI\_2. In the business context, FADD\_1 has a slight negative moderating effect ( $\beta = -0.015$ ) on AS\_2 and FRESGI\_1, while the government/academic perspectives strengthen it ( $\beta = 0.015$ ). Finally, the interaction between AS\_2 and FADD\_2 from the public sector perspective increases corporate ESG reporting ( $\beta = 0.119$ ). The effect of FADD\_2 on FRESGI\_2 in the public sector is modestly positive ( $\beta = 0.053$ ), suggesting a slight strengthening of ESG integration, consistent with [Liudmyla and Maria \(2022\)](#), who emphasize the importance of robust financial reporting standards.

In summary, this study builds on the work of previous authors while offering new insights into the role of digital disruption in ESG integration and financial reporting. The findings underscore the importance of sector-specific strategies and leadership in advancing ESG practices and highlight the need for robust collaboration between sectors to overcome challenges in ESG adoption. The results reinforce the need for a multifaceted understanding of the moderating role of FADD in shaping the relationship between AS and FRESGI, providing valuable implications for further research and practical application.

## 6. Conclusions

This study investigated the moderating role of finance, accounting, and digital disruption (FADD) in the relationship between auditing and sustainability (AS) and financial reporting and ESG integration (FRESGI), framed within the triple-helix perspective. Drawing on data collected from 200 experts across the corporate, academic, and government sectors in Kosovo between 2024 and Q1 2025, the findings offer valuable insights into the dynamic interactions that are reshaping sustainable financial practices.

The empirical analysis, conducted through SPSS and AMOS using exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and moderation analysis, highlights the

significant moderating role of FADD. Financial and accounting practices, alongside digital innovations such as AI and blockchain, have been found essential in strengthening ESG integration by aligning traditional auditing processes with evolving ESG requirements.

### 6.1. Practical Implications

**Corporate Sector:** Firms are encouraged to invest strategically in advanced digital tools and strengthen internal audit systems to improve ESG reporting quality and reliability. Emphasizing digital literacy among accounting and finance teams will be crucial for meeting increasing stakeholder demands for transparency and accountability.

**Government and Policymakers:** Regulatory bodies should provide clearer frameworks and sector-specific policies that support ESG integration, particularly in adapting to digital transformation. Offering incentives for digital innovation in auditing and reporting can further accelerate sustainable practices.

**Academic Institutions:** Academia should continue to drive research on the intersection of digital disruption, sustainability, and auditing while also developing educational programs that equip future auditors and accountants with the skills needed for ESG-focused financial reporting. Collaborative partnerships with industry and government can foster innovation and knowledge transfer in this evolving field.

### 6.2. Directions for Future Research

While this study offers important contributions to the understanding of the moderating role of finance, accounting, and digital disruption (FADD) in auditing, sustainability, and ESG integration, it is not without limitations. Future research could benefit from adopting longitudinal designs to capture the evolving influence of FADD over time and to establish clearer causal relationships among the key constructs. Additionally, extending the research to different geographic regions and industry sectors could uncover sector-specific or regional variations in the interactions between auditing practices, digital transformation, and ESG integration. Such comparative studies would enrich the generalizability and contextual relevance of the findings.

It is also important to note that environmental factors and respondents' personal perspectives may influence the results. Future studies should consider incorporating a broader range of environmental variables and adopting mixed-method approaches (e.g., combining quantitative surveys with qualitative interviews) to capture deeper insights into how contextual and personal factors shape ESG reporting and auditing practices.

In conclusion, this research provides an interdisciplinary understanding of how finance, accounting, and digital disruption moderate the relationship between auditing, sustainability, and ESG integration within the triple-helix framework. Strengthening the collaboration between corporate, governmental, and academic sectors is critical for advancing ESG transparency, accountability, and sustainability in financial reporting and auditing practices in the digital era.

**Author Contributions:** Conceptualization, E.L. and M.B.; methodology, E.L.; software, E.L.; validation, E.L.; formal analysis, E.L.; investigation, E.L.; resources, E.L. and M.B.; data curation, E.L.; writing—original draft preparation, E.L. and M.B.; writing—review and editing, E.L.; visualization, E.L.; supervision, E.L.; project administration, E.L.; funding acquisition E.L. and M.B. All authors have read and agreed to the published version of the manuscript.

**Funding:** This research received no external funding.

**Institutional Review Board Statement:** This study was conducted according to the guidelines of the Declaration of Helsinki, and ethical review and approval were waived for this study for the reason

that this study was conducted individually and independently by the institution where they work, respecting the anonymity of the interviewer.

**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** The data used to support and prove the findings of this study are available from the corresponding author upon request.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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