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# VIII. INTERNATIONAL ACCOUNTING AND FINANCE SYMPOSIUM

JULY 25 - 26, 2025 | ONLINE |

**VIII. INTERNATIONAL SYMPOSIUM ON ACCOUNTING AND FINANCE**
**COHOSTED BY MUFAD (AAFA)**
**and**
**MUDANYA UNIVERSITY,**
**FACULTY OF ARTS AND SOCIAL SCIENCES**

# VIII. INTERNATIONAL SYMPOSIUM ON ACCOUNTING AND FINANCE SYMPOSUIM PROCEEDING BOOK

**25-26 July 2025 - ONLINE**

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**VIII. INTERNATIONAL SYMPOSIUM ON ACCOUNTING AND FINANCE**
**Cohosted by MUFAD and Mudanya University**
**Faculty of Arts and Social Sciences**
**25-26 July 2025- Online**

# PRESENTATION

**Dear Participants,**

It is with great pleasure and pride that I present the proceedings of the 8th International Accounting and Finance Symposium, held on July 25–26, 2025, in collaboration with the Accounting and Finance Academicians Association (AAFA) and Mudanya University. Hosted in a virtual environment, this symposium provided an inclusive and accessible platform for the exchange of scholarly ideas, overcoming geographical boundaries through the opportunities afforded by digital technologies.

Bringing together distinguished academics and practitioners from across the globe, the symposium served as a vital meeting point for discussing the dynamic and evolving landscape of accounting and finance. The event witnessed the presentation of 23 academic papers by esteemed scholars from 23 different universities in Türkiye, along with the contributions of respected invited speakers representing Romania, Slovakia, Lithuania, Moldova, and Türkiye.

The breadth of topics addressed during the symposium was both timely and relevant, encompassing:
Green finance and green accounting, ESG practices in finance and accounting, digital banking applications, reporting framework, sustainability reporting and corporate governance and accounting quality, ethics, and market interactions.

The symposium hosted eight parallel sessions, where participants engaged in rich academic dialogue, shared research findings, and contributed to interdisciplinary collaboration. The high level of participation and the enthusiastic involvement of attendees throughout the two-day program are strong indicators of the event's success.

I would like to extend my sincere appreciation to:
Prof. Emin Karip, Rector of Mudanya University,
Dr. Hasan Özçelik, President of the Public Oversight Authority,
Prof. Cemal İbiş, representing TÜRMOB, for their opening remarks and support.

My special thanks go to our invited speakers:
Prof. Cătălin N. Albu, Bucharest University of Economic Studies, Romania,
Assoc. Prof. Václav Kupec, University of Trnava, Slovakia
Assoc. Prof. Erika Besuspariene, Vytautas Magnus University, Lithuania
Assoc. Prof. Maria Cojocaru, Moldova State University
Prof. Banu Sultanoğlu, Bilkent University, Türkiye
Dr. Hasan Özçelik, President of the Public Oversight, Accounting and Auditing Standards Authority

I am also deeply grateful to the organizing committee, the scientific board, the session chairs, and the researchers who contributed with their papers. I would like to acknowledge the technical support provided by Mudanya University IT Center, and the editorial team responsible for the preparation of this proceedings volume.

This symposium not only enriched our academic knowledge but also reinforced the importance of global academic cooperation and interdisciplinary exchange in addressing contemporary issues in accounting and finance.

On behalf of AAFA and Mudanya University, I extend my heartfelt thanks to all participants and contributors, and I look forward to convening once again at our next symposium.

Prof. Dr. Ümit GÜCENME GENÇOĞLU
Chair of the Symposium

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Prof. Fatma Telli Karakoç – Karadeniz Teknik University, Türkiye
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Prof. Mustafa Emir – Karadeniz Teknik University, Türkiye
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**Symposium Detailed Program**
25th July

**10:00 – 11:45 Opening Session**

**Prof. Ümit GÜCENME GENÇOĞLU**
*Chair, Association of Accounting and Finance Academicians*
**Prof. Emin KARİP**
*Rector, Mudanya University*
**Prof. Cemal İbiş**
*TÜRMOB Treuser- The Union of Chambers of Certified Public Accountants and Sworn-in Certified Public Accountants of Türkiye*
**Ph.D. Hasan ÖZÇELİK**
*President, The Public Oversight Accounting And Auditing Standards Authority in Türkiye*

**12:00 – 13:00 Parallel Sessions (3 sessions)**

**Session A: GREEN FINANCE**

**CHAIR: Prof. Aylin POROY ARSOY**

1. **LEGAL FRAMEWORK IN TURKIYE FOR THE TRANSITION FROM GREENWASHING TO GREEN TRUST**
   Prof. Ayşe Banu BAŞAR
   *Anadolu University*
   Prof. Seval KARDEŞ SELIMOĞLU
   *Anadolu University*
2. **GREENWASHING PRACTICES IN SUSTAINABILITY REPORTS AND THEIR FINANCIAL REFLECTIONS: AN INTERNATIONAL CASE STUDY ANALYSIS**
   Prof. Arman Aziz KARAGÜL
   *Anadolu University*
   Prof. Seval KARDEŞ SELİMOĞLU
   *Anadolu University*
3. **THE EVOLUTION OF GREEN ACCOUNTING STUDIES: A BIBLIOMETRIC REVIEW OF WOS-INDEXED PUBLICATIONS (1992-2025)**
   Assoc. Prof. Alper Tunga ALKAN
   *Selçuk University*
   CPA Hakan ACER
   *Karamanoğlu Mehmetbey University*

**Session B: FINANCE AND ESG APPLICATIONS**

**CHAIR:** Assoc. Prof. Dr. Şerif CANBAY

1. **ESG DISCLOSURE AND FINANCIAL PERFORMANCE: EVIDENCE FROM NON-FINANCIAL FIRMS IN THE BIST 50 INDEX**
   Res. Asst. Ümran BULUT SU
   *Mudanya University*
2. **THE CAUSALITY RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND GROWTH: EVIDENCE FROM MINT COUNTRIES**
   Assoc. Prof. Dr. Şerif CANBAY
   *Düzce University*
   Lecturer Ph.D. Elveda ÖZDİLEK KIRCA
   *Ordu University*

3. **EVALUATING THE IMPACT OF ESG SCORES ON FINANCIAL PERFORMANCE: A COMPREHENSIVE BIBLIOMETRIC STUDY**
   Asst. Prof. Azize KAHRAMANİ KOÇ
   *Kafkas University*
   Assoc. Prof. Musa GÜN
   *Recep Tayyip Erdogan University*

**Session C: AUDITING AND GOVERNANCE**
**CHAIR:** Asst. Prof. Serkan ŞENGÜL

1. **DOES INTEGRATED REPORTING AFFECT FINANCIAL PERFORMANCE? AN INVESTIGATION ON THE TURKISH BANKING INDUSTRY**
   Ph.D. Ersin YENİSU
2. **THE EFFECT OF NON-AUDITING SERVICES ON AUDIT REPORT LAG: BIST ALL INDEX APPLICATION**
   Res. Asst. NESİL İŞBİL
   *Kütahya Dumlupınar University*
   Prof. Emin ZEYTINOĞLU
   *Kütahya Dumlupınar University*
3. **GOVERNANCE QUALITY AND CAPITAL MARKET INTERACTION: AN EMPIRICAL STUDY ON THE BIST 100 INDEX**
   Asst. Prof. Serkan ŞENGÜL
   *Mudanya University*
   Asst. Prof. Hakan YILDIZ
   *Medipol University*

**13:00 – 13:20 Mid-Break**
**13:20 – 14:00 KEYNOTE SPEECH**
**CHAIR: Prof. Batuhan GÜVEMLİ**
**TITLE: NAVIGATING MANDATES: THE CONTEXTUAL DYNAMICS OF RESPONSES TO NON-FINANCIAL REPORTING REQUIREMENTS.**
Prof. Cătălin N. ALBU
*Bucharest University of Economic Studies - Romania*

**14:15 – 15:15 Parallel Sessions (3 sessions)**

**Session D: DIGITAL BANKING APPLICATIONS**
**CHAIR:** Prof. İffet KESİMLİ

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   Assoc. Prof. Begüm ÖKTEM
   *Marmara University*
2. **THE ADVENTURE OF EMBEDDED FINANCE IN TÜRKİYE**
   Prof. İffet KESİMLİ
   *Kırklareli University*
3. **THE EFFECT OF BUSINESSES’ DIGITAL TRANSFORMATION ON EXPORT PERFORMANCE**
   Özlem ÇELİK DEMİR
   Assoc. Prof. Dursun BOZ
   *Mudanya University*

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**CHAIR:** Prof. Burcu ADİLOĞLU

1. **ANALYSIS OF THE IMPACT OF SUSTAINABILITY REPORTING ON FINANCIAL INDICATORS USING TEXT MINING: EVIDENCE FROM BIST**
   Assoc. Prof. Dr. Neriman YALÇIN
   *Adana Alparslan Türkeş Science and Technology University*
   Asst. Prof. Mehmet GÜNEŞ
   *Adana Alparslan Türkeş Science and Technology University*
2. **ASSESSING THE DISCLOSURE PRACTICES OF CONTINGENT LIABILITIES AND CONTINGENT ASSETS UNDER IAS 37: EVIDENCE FROM BIST 30 COMPANIES**
   Asst. Prof. Merve ÖZ
   *MEF University*
   Prof. Burcu ADİLOĞLU
   *Istanbul University*
3. **APPLICATION OF ACTUARIAL VALUATION METHOD IN TFRS 17 INSURANCE CONTRACTS STANDARD**
   Asst. Prof. Naim VAROL
   *Kapadokya University*

**Session F: CORPORATE GOVERNANCE AND SUSTAINABILITY APPROACHES**

**CHAIR:** Prof. Yasemin Ertan

1. **NAVIGATING GLOBAL UNCERTAINTIES: THE FINANCIAL SOUNDNESS OF THE TURKISH BANKING SECTOR IN THE POST-REFORM ERA**
   Assoc. Prof. Dr. Merve TUNCAY
   *Sivas Cumhuriyet University*
2. **WHISTLEBLOWING ON ACCOUNTING PROFESSION: WHAT DO ACCOUNTING PROFESSION INTERNS THINK?**
   Asst. Prof. D. Ali KIZILYALÇIN
   *Aydın Adnan Menderes University*
   Assoc. Prof. Bahar GÜRDİN
   *Aydın Adnan Menderes University*
3. **THE ROLE OF INTERNAL CONTROL IN CORPORATE SUSTAINABILITY PERFORMANCE: AN EMPIRICAL STUDY ON INDUSTRIAL ENTERPRISES**
   Assoc. Prof. Feyza DEREKÖY
   *Istanbul Medipol University*
   Asst. Prof. İpek YAYLALI
   *Istanbul Medipol University*
   Asst. Prof. Esra BAYTÖREN
   *Istanbul Medipol University*

**15:30 – 16:10 KEYNOTE SPEECH**

**CHAIR:** Assoc. Prof. Yusuf KURT

**TITLE: MODERN APPROACHES TO ESG DIAGNOSTIC AUDIT**

Assoc. Prof. Vaclav KUPEC
*University of Ss. Cyril and Methodius in Trnava*

**26th July**

**10:00 – 10:40 KEYNOTE SPEECH**

**CHAIR:** Assoc. Prof. Funda ÖZÇELIK

**TITLE: GLOBAL AND LOCAL DEVELOPMENTS IN SUSTAINABILITY REPORTING: KEY CHANGES AND TRENDS**

Assoc. Prof. Banu SULTANOĞLU
*Bilkent University*

**10:50 – 11:50 Parallel Sessions (2 sessions)**

**Session G: QUALITY, ETHICS, AND MARKET INTERACTIONS IN ACCOUNTING**

**CHAIR:** Prof. Elif Yücel

1. **THE IMPACT OF BIG FOUR AUDIT FIRMS AND OTHER AUDIT FIRMS ON ACCRUAL QUALITY**
   Prof. Fatih Coşkun ERTAŞ
   *Atatürk University*
   Res. Asst. Beyza DEMİR
   *Atatürk University*
2. **CONVERGING OR DIVERGING? A COMPARATIVE REVIEW OF ETHICS EDUCATION REQUIREMENTS IN PROFESSIONAL ACCOUNTING BODIES**
   Asst. Prof. Zeynep YAROĞLU
   *Ankara Hacı Bayram Veli University*
3. **THE RELATIONSHIP BETWEEN CRYPTOCURRENCIES AND STOCK MARKETS. A SYSTEMATIC LITERATURE REVIEW**
   Assoc. Prof. Burak ÖZDOĞAN
   *Manisa Celal Bayar University*
   İlke DİKİCİ

**Session H: SUSTAINABILITY REPORTING AND CORPORATE GOVERNANCE**

**CHAIR:** Assoc. Prof. Yusuf KURT

1. **TÜRKIYE SUSTAINABILITY REPORTING STANDARDS (TSRS) COMPLIANCE MEASUREMENT: AN ARTIFICIAL INTELLIGENCE-SUPPORTED RESEARCH ON THE BIST SUSTAINABILITY INDEX**
   Assoc. Prof. Yusuf KURT
   *Van Yüzüncüyıl University*
2. **THE MODERATING EFFECT OF COVID-19 ON THE RELATIONSHIP BETWEEN CORPORATE GOVERNANCE AND FINANCIAL FLEXIBILITY**
   Asst. Prof. Ebru AYDOĞAN
   *Bursa Uludag University*

**12:00 – 13:00 Mid-Break**

**13:00 – 13:40 KEYNOTE SPEECH**

**CHAIR:** Asst. Prof. Serkan ŞENGÜL

**TITLE: DISCLOSURE OF CLIMATE CHANGE MITIGATION AND ADAPTATION TARGETS BASED ON EUROPEAN SUSTAINABILITY REPORTING STANDARDS**

Assoc. Prof. Erika BESUSPARIENE
*Vytautas Magnus University – Lithuania*

**13:45 – 14:25 KEYNOTE SPEECH**

**CHAIR:** Prof. Seval KARDEŞ SELİMOĞLU

**TITLE: THEORETICAL AND PRACTICAL CHALLENGES IN INTEGRATING SUSTAINABILITY REPORTING STANDARDS INTO THE FINANCIAL REPORTING OF AGRICULTURAL BUSINESSES IN THE REPUBLIC OF MOLDOVA**

Assoc. Prof. Maria COJOCARU
*Moldova State University*

**14:30 – 15:25 KEYNOTE SPEECH (TR)**

**CHAIR** Assoc. Prof. Dursun BOZ

**TITLE: YEŞİL, DİJİTAL VE TOPLUMSAL DÖNÜŞÜM EKSENİNDE TÜRKİYE'NİN SÜRDÜRÜLEBİLİRLİK RAPORLAMASI YAKLAŞIMI VE MUHASEBE EĞİTİMİNDE YENİDEN YAPILANMA İHTİYACI**

Ph.D. Hasan ÖZÇELİK
*Head of Public Oversight Accounting And Auditing Standards Authority in Türkiye*

**15:30 – 16:30 PANEL (TR): FİNANSAL VE FİNANSAL OLMAYAN RAPORLAMADA SON GELİŞMELER**

**Panelists:**

**Seval SİR**
*Association of Chartered Certified Accountants -ACCA*
*Türkiye Country Manager*

**Expert Esra ARIKAN**
*Public Oversight Accounting And Auditing Standards Authority in Türkiye*

**Muharrem Karataş**
*Vice President of TÜRMOB Independent Audit Sustainability Center*

*Program sırasına göre içindekiler yazılacak*

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# KEYNOTE SPEECH

# GLOBAL AND LOCAL DEVELOPMENTS IN SUSTAINABILITY REPORTING: KEY CHANGES AND TRENDS

**Banu Sultanoğlu***

## ABSTRACT

**This study aims to ascertain recent global and local developments in sustainability reporting, with a focus on voluntary and mandatory reporting initiatives, their adoption globally and recent related changes. It highlights key global developments including IFRS S1 and S2 published by the International Sustainability Standards Board (ISSB) in 2023, the European Sustainability Reporting Standards (ESRS) published under the Corporate Sustainability Reporting Directive (CSRD) in the same year and recent regulatory changes such as the European Commission's Omnibus Package and the SEC Climate Rules. The study also draws attention to the importance of other reporting initiatives such as GRI, TCFD, CDP and SASB, which are still widely used in global terms. Moreover, regarding local developments, the mandatory implementation of the Turkish Sustainability Reporting Standards (TSRS) in Türkiye for the entities in scope as of 2024 and other local sustainability-related developments are also conveyed. The significant global developments that have emerged notably beginning in 2023 clearly indicate that sustainability reporting is beginning to transform from a voluntary practice to a standardized regulatory requirement.**

**Keywords:** Sustainability reporting, European Sustainability Reporting Standards (ESRS) Turkish Sustainability Reporting Standards (TSRS)

## SÜRDÜRÜLEBİLİRLİK RAPORLAMASINDA KÜRESEL VE YEREL GELİŞMELER: TEMEL DEĞİŞİKLİKLER VE TRENDLER

## ÖZET

**Bu çalışma, gönüllü ve zorunlu raporlama girişimlerine, bunların küresel olarak benimsenmesine ve son dönemdeki ilgili değişikliklere odaklanarak, sürdürülebilirlik raporlamasındaki son küresel ve yerel gelişmeleri tespit etmeyi amaçlamaktadır. Uluslararası Sürdürülebilirlik Standartları Kurulu (ISSB) tarafından 2023 yılında yayınlanan UFRS S1 ve S2, aynı yıl Kurumsal Sürdürülebilirlik Raporlama Direktifi (CSRD) kapsamında yayınlanan Avrupa Sürdürülebilirlik Raporlama Standartları (ESRS) ve Avrupa Komisyonu'nun Omnibus Paketi ve SEC İklim Kuralları gibi son düzenleyici değişiklikler de dahil olmak üzere önemli küresel gelişmeleri vurgulamaktadır. Çalışma ayrıca, küresel anlamda hala yaygın olarak kullanılan GRI, TCFD, CDP ve SASB gibi diğer raporlama girişimlerinin önemine de dikkat çekmektedir. Ayrıca, yerel gelişmeler bağlamında, 2024 itibarıyla kapsam dahilindeki işletmeler için Türkiye Sürdürülebilirlik Raporlama Standartları'nın (TSRS) Türkiye'de zorunlu olarak uygulanması ve sürdürülebilirlikle ilgili diğer yerel gelişmeler de aktarılmaktadır. Özellikle 2023'ten itibaren ortaya çıkan önemli**

* Assoc.Prof., Bilkent University Faculty of Business Administration, sbanu@bilkent.edu.tr

**küresel gelişmeler, sürdürülebilirlik raporlamasının gönüllü bir uygulamadan standartlaştırılmış bir düzenleyici gerekliliğe dönüşmeye başladığını açıkça göstermektedir.**

**Anahtar Kelimeler**: Sürdürülebilirlik raporlaması, Avrupa Sürdürülebilirlik Raporlama Standartları (ESRS), Türkiye Sürdürülebilirlik Raporlama Standartları (TSRS)

## 1. INTRODUCTION

In the World Economic Forum's The *Global Risks Report*, 2025, according to the Global Risks Perceptions Survey[1], environmental and other sustainability-related risks have consistently been ranked by severity among the top global risks in both upcoming two-year and ten-year timeframes. Moreover, the *Executive Opinion Survey*[2] included in the same report reveals a similar outlook in the sense that environmental risks are perceived as the second layer top global risks coming immediately after the economic ones (11-16th out of 34 risks) by business leaders. This shows that sustainability-related risks are not only viewed as global threats but are also considered critical by the business world. Due to the increasing global awareness of stakeholders around sustainability issues, sustainability reporting has shifted from what was once perceived as a trend into a necessity. Thus, it became a critical tool for entities to disclose relevant and fair sustainability-related risks and opportunities in a structured manner to address the sustainability issues facing the world today. Based on the results of KPMG Global Survey of Sustainability Reporting, 2024, currently, 96% of G250 companies publish sustainability reports, indicating a significant level of adoption globally (www.kpmg.com).

Sustainability reports are an important tool that entities use to communicate environmental, social and governance (ESG) risks and opportunities with stakeholders, helping them to make informed decisions. These reports offer benefits both for both entities and stakeholders, particularly investors. In terms of benefits for entities, sustainability reports help enhance reputation and stakeholder trust, reduce business risks, easier access to capital and better economic performance (Farooq and Muhammad, 2025; Al-Hiyari and Kolsi 2021). Similarly, for investors, sustainability reports provide insights into a company's environmental and social impacts, helping to assess long-term financial performance and sustainability-related risks and opportunities. According to Global Investor Survey conducted by PWC in 2023-2024, 75% of the investors believe that how a company manages sustainability-related risks and opportunities is an important factor in their decision-making and want to know about the impact the company has on the environment and society.

In recent years, sustainability reporting has moved beyond voluntary disclosure to become a regulated and standardized practice in many jurisdictions. Globally, various international organizations have taken significant steps to harmonize existing sustainability reporting frameworks and promote transparency and comparability. In particular, the period between 2023 and 2024 marks an important change for sustainability reporting, driven by significant regulatory milestones. On June 26, 2023, the International Sustainability Standards Board (ISSB), established during COP 26 on November 3, 2021, published the IFRS Sustainability Disclosure Standards: IFRS S1 *General Requirements for Disclosure of Sustainability-Related Financial Information* and IFRS S2 *Climate-related Disclosures.* The aim of ISSB Standards is to establish a globally consistent framework for sustainability-related financial disclosures, effective from January 1, 2024. Simultaneously, on January 5, 2023, the European Union introduced the Corporate Sustainability Reporting Directive (CSRD), which mandated detailed sustainability-related disclosures based on the European Sustainability Reporting Standards (ESRS) published by European Financial Reporting Advisory Group (EFRAG) on July 31, 2023 and effective from January 1, 2024. These long-awaited standards are expected to provide a unified framework for corporate reporting by bringing together sustainability and financial disclosures. Subsequently, in 2024, even though the US does not have compulsory sustainability reporting regulations, the Securities and Exchange Commission (SEC)

[1] Results From Over 900 Global Leaders Across Academia, Business, Government, İnternational Organizations And Civil Society.
[2] Results From Over 11,000 Executives In Countries (Such As The G20 Or Eu)

implemented stringent SEC Climate Rules, reshaping corporate reporting obligations of publicly traded companies including IPOs in the United States beginning with annual reports for the year ending December 31, 2025. However, in 2025, the SEC withdrew its legal defense of the Climate Disclosure Rules amid ongoing lawsuits, creating significant uncertainty about their implementation.

While ISSB's IFRS S1 and S2 and the EU's ESRS represent major steps toward global alignment, the Global Reporting Initiative (GRI), in particular, remains widely used especially in disclosures focused on impact materiality and multi-stakeholder interests. According to KPMG Global Survey of Sustainability Reporting, 2024, 77% of G250 companies and 71% of N100 companies continue preparing sustainability reports based on GRI (www.kpmg.com). In addition, frameworks such as the Task Force on Climate-related Financial Disclosures (TCFD), the Carbon Disclosure Project (CDP), and the Sustainability Accounting Standards Board (SASB) continue to play a significant role in shaping sustainability reporting practices. Many entities either supplement ISSB and ESRS-based disclosures with these frameworks or use them to meet overlapping requirements.

A significant recent development concerning the ESRS framework occurred in early 2025, when the European Commission (the Commission) released an Omnibus Package. The package, also called Simplification Package, aims to reduce the sustainability reporting and due diligence burden on companies and at the same time simplify and reduce EU sustainability reporting requirements. In contrast to the released Omnibus Package proposed narrowing of scope, the ISSB Standards have gained significant global adoption despite being voluntary. According to the IFRS announcement, more than 30 jurisdictions have announced plans to adopt or align with these standards as of 2025 (www.ifrs.org). Among those, more than half of those jurisdictions including Türkiye have formally announced or finalized their decisions on the adoption or other use of ISSB Standards and others have finalized their approach but are still in development, or whose regulatory status is in progress.

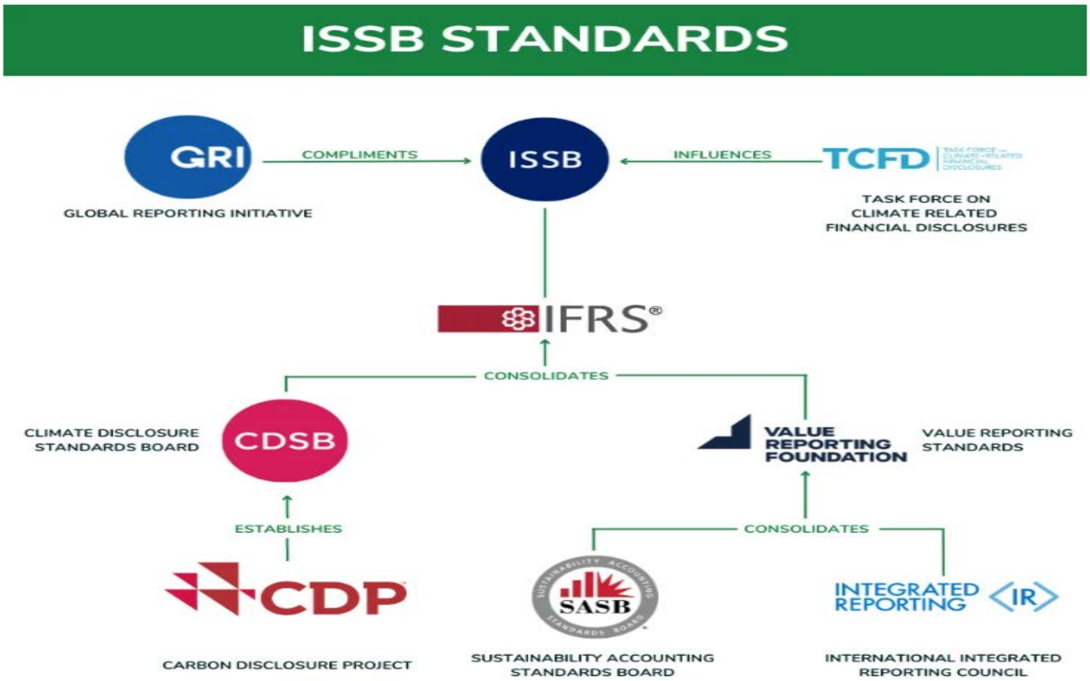
This study discusses the recent global and local developments in sustainability reporting, focusing on voluntary and mandatory reporting initiatives, their adoption across jurisdictions and the recent changes related to these initiatives.

## 2. GLOBAL RECENT DEVELOPMENTS IN SUSTAINABILITY REPORTING

Recent developments in sustainability reporting landscape have been driven by key international initiatives, including the ISSB Standards, the EU's ESRS, the SEC's Climate Rules, and widely recognized frameworks like GRI, TCFD, CDP, and SASB.

### 2.1. IFRS Sustainability Disclosure Standards by ISSB

On 26 June 2023, the ISSB launched its first two international sustainability standards that become effective for periods beginning on or after 1 January 2024; IFRS S1 'General Requirements for Disclosure of Sustainability-related Financial Information' and IFRS S2 'Climate-related Disclosures'. IFRS S1 outlines the general requirements for comprehensive sustainability-related financial disclosures, and IFRS S2 is a topic-specific standard that sets out the disclosures needed for climate-related information. To create these standards, the ISSB drew on the work of other sustainability disclosure standards, such as the Climate Disclosure Standards Board (CDSB), the Task Force on Climate-related Financial Disclosures (TCFD), the Value Reporting Foundation's Integrated Reporting Framework, and industry-based guidance from the Sustainability Accounting Standards Board (SASB). The aim is to 'inter-operate' with other standards. That is, if companies report according to any of the existing major frameworks, they'll find it easier to adopt IFRS S1 and S2 (Cox, 2024).




Source: Hannay,J., 2023. Sustainability News

The ISSB clearly promotes an integrated reporting structure that combines financial and non-financial disclosures, acknowledging the timing differences typically associated with traditional financial reporting and sustainability communication (Avi, 2022). In this context, ISSB Standards represent a global baseline for sustainability related financial disclosure that simplifies the landscape and seek to equip investors and other users with relevant sustainability-related financial data that help them evaluate the enterprise value of an entity across the short, medium, and long term (www.ifrs.org).

IFRS S1 requires an entity to disclose information about all sustainability-related risks and opportunities that could reasonably be expected to affect the entity's cash flows, its access to finance or cost of capital over the short, medium or long term (entity's prospects) (IFRS S1 § 3). It sets out general requirements for the content and presentation of sustainability-related financial disclosures so that the information disclosed is useful to users in making decisions relating to providing resources to the entity (IFRS S1 § 4). IFRS S1 provides important guidance on the assessment of materiality, sets out the qualitative characteristics of useful sustainability-related information e.g. relevance and faithful representation and the concepts such as sustainability-related risks & opportunities, the reporting company, timing and location of reporting, connected and comparative information. It also provides sources of guidance in the absence of IFRS Sustainability Disclosure Standard. IFRS S1 requires entities to structure their sustainability-related disclosures around four core content areas; governance, strategy, risk management, and metrics and targets based on the framework developed by TCFD. In particular, an entity is required to provide disclosures about (www.ifrs.org):

a. *Governance:* the governance processes, controls and procedures the entity uses to monitor, manage and oversee sustainability-related risks and opportunities;
b. *Strategy:* the entity's strategy for managing sustainability-related risks and opportunities;
c. *Risk Management:* the processes the entity uses to identify, assess, prioritize and monitor sustainability-related risks and opportunities; and
d. *Metrics & Targets:* the entity's performance in relation to sustainability-related risks and opportunities, including progress towards any targets the entity has set or is required to meet by law or regulation.

The purpose of IFRS S2 is to ensure that entities disclose decision-useful information on climate-related risks and opportunities to primary users of general-purpose financial reports (IFRS S2 § 1). The standard requires an entity to disclose information about climate-related risks and opportunities that could reasonably be expected to affect the entity's cash flows, its access to finance or cost of capital over the short, medium or long term (entity's prospects). It is applied in conjunction with IFRS S1 and sets out disclosure requirements including industry-based climate-related metrics and targets for the identification, measurement, and disclosure of financial information relevant to climate change. Hence, the scope of the standard covers disclosures on two primary categories of climate-related risks namely, physical risks (both acute and chronic) and transition risks (such as regulatory, market, technological, and reputational risks) as well as the opportunities arising from climate-related factors (IFRS S2 § 3–4). Similar to IFRS S1, IFRS S2 requires entities to structure their sustainability-related disclosures around four core content areas; governance, strategy, risk management, and metrics and targets based on TCFD. For determining climate-related risks and opportunities, the entities shall refer to SASB industry-specific guidance, covering 77 industries and may refer to the guidance from the CDSB, particularly in relation to water and biodiversity-related risks. IFRS S2 is accompanied by Industry-based Guidance on Implementing IFRS S2 and requires an entity to refer to the industry-based guidance, when identifying its climate-related risks and opportunities.

By 2025, more than thirty jurisdictions have adopted or otherwise used the ISSB Standards or are in the process of finalizing steps towards introducing them into their regulatory frameworks. Of these, 17 jurisdictions including Türkiye have formally announced or finalized their decisions on the adoption or other use of ISSB Standards, while 16 others have finalized their approach but are still in the development stage or awaiting final regulatory confirmation (www.ifrs.org).

### 2.2. European Sustainability Reporting Standards by EFRAG

The European Commission introduced the Corporate Sustainability Reporting Directive (CSRD) on January 5, 2023 as part of the European Green Deal. Under the Directive, companies are required to disclose sustainability-related information in accordance with the European Sustainability Reporting Standards (ESRS), which were developed by EFRAG and published on July 31, 2023. The European Sustainability Reporting Standards comprise 12 sector-agnostic standards, including two cross-cutting standards, namely ESRS 1 "General Requirements" and ESRS 2 "General Disclosures" and ten topical standards addressing specific reporting areas; environmental, social and governance. Five of those are related to environment (ESRS E1-E5), four of them are social (ESRS S1-S4) and lastly one for governance (ESRS G1).

Under the initial implementation of the ESRS, large and listed companies within the European Union were obliged to adopt the ESRS in accordance with the CSRD. As a result, approximately 50,000 companies were expected to fall within the scope and therefore required to begin reporting in line with ESRS for financial years starting on or after January 1, 2024. Accordingly, ESRS was expected to take effect between 2024 and 2028 as follows (https://finance.ec.europa.eu):

- From 1 January 2024 for entities already subject to the Non-Financial Reporting Directive (NFRD) such as large, listed entities, large banks and large insurance entities (all with more than 500 employees), along with large non-EU listed entities with over 500 employees (reporting in 2025 on 2024 data)
- From 1 January 2025 for large entities not currently subject to the NFRD (reporting in 2026 on 2025 data)
- From 1 January 2026 for listed SMEs, including non-EU listed SMEs (reporting in 2027 on 2026 data); SMEs can opt-out until 2028
- From 1 January 2028 for non-EU entities (filing of 2028 data)

To ease the transition, the adoption of sector-specific standards were postponed until June 2026. For non-listed SMEs that fall outside the CSRD's scope, EFRAG is currently developing voluntary, simplified reporting standards.

Two cross-cutting ESRSs explain fundamental concepts from the CSRD, provide principles of disclosure and presentation structure and mainly set cross-cutting disclosure requirements applicable to all topics for:

- Governance
- Strategy
- Impact, risk and opportunity management
- Metrics and targets

Ten topic-specific ESRSs establish metrics and explain how to disclose related targets for each topic and provide topic-specific disclosure requirements on:

- Governance
- Strategy
- Impact, risk and opportunity management

Then, an unforeseen development with respect to ESRS implementation occurred and in early 2025, the European Commission introduced an Omnibus Package, also called Simplification Package proposing a reduction in the scope of sustainability reporting and due diligence requirements. Under the proposal, only large companies with more than 1,000 employees and a net turnover exceeding EUR 450 million would remain subject to the CSRD and thus required to report under the ESRS. According to the Commission, this would result in an estimated 80% reduction in the number of in-scope companies which can be considered as an unexpected shift in the implementation (Vaessen, 2025). This Package mainly aims to:

- simplify and reduce EU sustainability reporting requirements
- reduce compliance complexities for all companies, focus on the largest companies having bigger impact on the environment and climate.

### 2.3. SEC Climate Rules

In 2024, the Securities and Exchange Commission (SEC) issued SEC Climate Rules that mandates financial reporting on climate-related disclosures by publicly traded companies including IPOs beginning with annual reports (10-K reports) for the year ending December 31, 2025, for calendar-year-end large accelerated filers.

Under the SEC Climate Rules, the entities will be required to report on material climate-related risks, including descriptions of such risks as physical or transition, the board's oversight and associated risk management practices, as well as the significant impacts of these risks on the company's strategy. The structure for the disclosures is based on TCFD. In addition, large and accelerated filers must disclose material Scope 1 and Scope 2 greenhouse gas (GHG) emissions, which will also be subject to independent third-party assurance.

Since the SEC rules draws on TCFD and the Greenhouse Gas Protocol, the entities that currently report, or are in the process of preparing to report, in alignment with those initiatives may easily comply with the SEC's requirements. Still, they will need to re-evaluate their disclosures based on the explicit requirements of the SEC rules (www.ey.com).

### 2.4. Other Initiatives

In addition to regulatory standards such as ISSB and ESRS, several globally recognized voluntary initiatives play a critical role in guiding sustainability reporting. Among these, **GRI (Global Reporting Initiative),** the Task Force on Climate-related Financial Disclosures (TCFD), the Carbon Disclosure Project (CDP), and the Sustainability Accounting Standards Board (SASB) are among the most widely used initiatives.

### 2.4.1. GRI (Global Reporting Initiative)

The first version of the GRI Sustainability Reporting Guidelines (G1) was published in 2000. Updated versions of the guidelines were published as G2 in 2002, then G3 in 2006 and G4 in 2013. In 2016, GRI issued the first global set of sustainability reporting standards, namely the GRI Standards. A major update of standards took place in 2021 with new Universal Standards to strengthen the GRI reporting and to incorporate expectations on sustainability due diligence (including human rights). The last updated GRI Standards comprise three series of Standards (www.globalreporting.org/standards):

- *GRI Universal Standards:* apply to all organizations, and consist of GRI 1 that lists the requirements and principles for using the GRI Standards, GRI 2 that contains the disclosures about the reporting entity and GRI 3 explains the disclosures and guidance about the entity's material topics.
- *GRI Sector Standards: s*tandards that will be developed for 40 sectors for providing sector-specific disclosures. Up to date, the highest impact sectors, such as oil and gas (GRI 11), coal (GRI 12), agriculture, aquaculture, and fishing (GRI 13) and mining (GRI 14) have been released and are available for public use.
- *GRI Topic Standards:* provide detailed guidance for reporting on specific sustainability topics that are relevant to an organization's environmental, social, and economic impacts. GRI 201-206 are Economic Standards, GRI 301-308 are Environmental Standards and GRI 401-419 are Social Standards.

GRI, that focuses on impact materiality and multi-stakeholder interests remains widely used. According to KPMG Global Survey of Sustainability Reporting, 2024, 77% of G250 companies and 71% of N100 companies still prepare sustainability reports based on GRI. The forward-looking revision of the GRI Universal Standards enables entities to align their sustainability reporting with evolving regulatory requirements, including the EU's CSRD and the ISSB Standards.

During mid-June 2023, The Global Sustainability Standards Board (GSSB) has published the GSSB Work Program 2023-2025 that is based on stakeholder feedbacks. It covers a list of priorities for the next three years, including:

- Development of GRI Standards
  - Revision of Topic Standards
  - Development of new Topic Standards
  - Development of new Sector Standards
  - Revision of Sector Standards
- Implementation of GRI Standards
- Cooperation with other standard-setting bodies and international organizations (ESRS-GRI and ISSB-GRI Interoperability)

### 2.4.2. Task Force on Climate-related Financial Disclosures (TCFD)

The Taskforce on Climate Related Financial Disclosures (TCFD) is a global initiative established by the Financial Stability Board (FSB) in 2015 to improve and increase the reporting of climate-related financial risks and opportunities by companies and financial institutions. The TCFD developed eleven recommendations for voluntary climate-related financial disclosures, which were released in 2017. The TCFD Recommendations are structured around four core content areas: governance, strategy, risk management, and metrics and targets.

Effective 2024, ISSB took the responsibility for climate-related financial reporting after the official dissolvement of TCFD. As known, ISSB Standards draws on **the work of the TCFD, so u**sing the recommendations is a good entry point for companies transitioning to ISSB Standards. A**ccording to the official ISSB Statement, c**ompanies applying IFRS S1 *General Requirements for Disclosure of*

*Sustainability-related Financial Information* and IFRS S2 *Climate-related Disclosures* will meet the TCFD recommendations as the recommendations are fully incorporated into the ISSB Standards. The requirements in IFRS S2 are consistent with eleven TCFD Recommendations and structured based on the four core contents. Hence, a company applying IFRS S2 will provide all of the information covered by the TCFD recommendations (www.ifrs.org/sustainability).

The IFRS Foundation has published a comparison of the requirements in IFRS S2 and the TCFD recommendations. There are additional requirements in IFRS S2. These include the requirements for companies to disclose industry-based metrics, to disclose information about their planned use of carbon credits to achieve their net emissions targets and to disclose additional information about their financed emissions (www.ifrs.org/sustainability).

Hence, the TCFD has been a pioneer in improving the implementation and quality of climate-related disclosures. Even though these recommendations were introduced as voluntary, they have been widely recognized globally and become part of the regulatory framework in many jurisdictions, including the European Union, Singapore, Canada, Japan and South Africa. New Zealand and the United Kingdom are mandating climate risk disclosures in line with the TCFD by 2023 and 2025 respectively. Around 1,700 organisations worldwide, in the public and private sectors, as well as government entities, support the TCFD (Zymeri, 2023, www.deloitte.com).

### 2.4.3. Carbon Disclosure Project (CDP)

CDP, is an international nonprofit organization that provides an environmental impact disclosure system for use by both the private and public sectors. It is the world's leading disclosure platform for companies and cities today that reveals a record of 22,700+ scored companies. The first CDP questionnaire, that was issued in 2003 asked companies only about carbon emissions. After a decade, CDP started to request disclosures that are related to deforestation, water security and plastic use in addition to carbon footprints.

Data collection from CDP questionnaire enables CDP to track companies' and cities' progress on required sustainability issues and calculate scores for each disclosing entity. The CDP scores are intended to provide a snapshot of an entity's environmental performance. The scoring methodology is aligned with the TCFD. Companies and cities are scored from "D-" to "A," while companies that are asked to disclose but fail to do so receive "F" grades. Entities that receive "A" scores are considered leaders in environmental performance. Although, it is seen that the platform is being widely used, only 2% (515 companies) achieved A score, showing that while ambition is increasing, there is still room for improvement for true environmental stewardship. According to CEO of CDP, "*Their leadership is a blueprint for the economy we need. 2025 must be the year all companies move decisively from transparency to action. The companies that choose to disclose through CDP - and to be scored - are choosing progress. And they are choosing to lead.*" (www.cdp.net).

### 2.4.4. Sustainability Accounting Standards Board (SASB)

The Sustainability Accounting Standards Board (SASB), a non-profit organization was established in the US in 2011 to simplify and standardize the reporting language of sustainability efforts. In November 2018, the Board has developed a complete set of 77 industry-specific standards. SASB Standards serve a unique role in the global sustainability reporting landscape because it adds value by offering a framework that helps identify financially material sustainability issues and supplies industry-specific metrics relevant to investors. SASB Standards enable entities to provide industry-based disclosures about sustainability-related risks and opportunities that could reasonably be expected to affect the entity's cash flows, access to finance or cost of capital over the short, medium or long term with the ISSB building on this legacy (sasb.ifrs.org/standards).

As of August 2022, the ISSB assumed responsibility for the SASB Standards. The ISSB has committed to build on the industry-based SASB Standards and leverage SASB's industry-based approach to standards development. Hence, the SASB Standards play an important role in the first two IFRS Sustainability Disclosure Standards, IFRS S1 and S2. Therefore, the companies already familiar with the SASB Standards should be at an advantage when adopting the ISSB Standards. Under IFRS S1, companies are required to refer to the SASB Standards to identify relevant sustainability-related risks and opportunities and determine appropriate disclosures. Also, IFRS S2, incorporates industry-specific disclosure requirements and related guidance that are based on and consistent with the climate content found in the SASB Standards (Bradley, 2023).

**A noteworthy point to mention here is that**, since the SASB Standards are designed to provide sustainability-related disclosures that meet investor needs, companies that want to inform a broader range of stakeholders would also need to look to other standards, such as those from GRI or ESRS, both of which are aimed at a wider stakeholder audience.

Together with the GRI, the SASB is one of the most widely used frameworks for sustainability reporting. SASB Standards reporters since 2022 is 3,862 and in 2024 alone, 2,530 companies from 75 jurisdictions aligned their reporting to the SASB Standards (sasb.ifrs.org/standards).

## 3. LOCAL DEVELOPMENTS IN SUSTAINABILITY REPORTING

In Türkiye, on December 29, 2023, Public Oversight, Accounting and Auditing Standards Authority published Turkish Sustainability Reporting Standards (TSRS) TSRS 1 & TSRS 2 (direct adoption of ISSB Standards) which makes sustainability reporting mandatory for companies within the scope and become effective for periods beginning on or after 1 January 2024. In this regard, Türkiye has been recognized as one of the jurisdictions that have formally committed to directly adopting the ISSB Standards. This has been publicly acknowledged in official communications issued by the ISSB. **The entities covered by the decision include:**

- **Companies regulated and supervised by the Capital Markets Board**,
- **Enterprises regulated and supervised by the Banking Regulation and Supervision Agency (e**xcept for banks transferred to the Savings Deposit Insurance Fund of Türkiye),
- Authorized institutions, precious metals intermediary institutions, and companies engaged in the production or trade of precious metals that are permitted to operate in Borsa Istanbul (BIST),
- **Companies authorized to operate in BIST**

If the entities listed above exceed at least two of the threshold criteria below in two consecutive reporting periods, the application of the TSRS becomes mandatory for the preparation of their sustainability reports.

- ✓ total assets of 500M TL
- ✓ annual net sales 1B TL
- ✓ number of employees 250

**The following changes have been made by** the Amendment to the Scope of Application of the TSRS dated 06/03/2025:

- ✓ Banks listed on the stock exchange and those with more than one branch or more than 250 employees as of the previous year-end are subject to mandatory application without being subject to any threshold criteria.
- ✓ Non-bank financial institutions that are listed on the stock exchange, as well as those with more than one branch or more than 250 employees as of the previous year-end, are subject to mandatory application if they meet the threshold criteria.

Although not mandatory, entities that fall outside the scope may also choose to report in accordance with the TSRS on a voluntary basis.

Currently, 402 companies have issued 2024 ending annual reports with sustainability disclosures based on TSRS 1 & TSRS 2.

**In Türkiye, the independent assurance of sustainability reports is expected to begin in 2025.** Although the TSRS entered into force for reporting periods starting on or after January 1, 2024, a one-year transition period has been granted for assurance. This allows companies time to prepare their first sustainability reports.

**Furthermore, Borsa İstanbul launched the BIST Sustainability Index in 2014** to offer investors a benchmark for evaluating the companies' sustainability performance. **As of 2024, the Index includes 88 companies** that meet defined sustainability criteria. Additionally, **in 2022, the BIST Sustainability 25 Index was launched**, which tracks the top 25 companies with the highest sustainability performance, providing a more focused tool for sustainability-oriented investment strategies.

## 4. CONCLUSION

Currently, in general, the sustainability reporting landscape is shaped by four major initiatives, some of which are voluntary and others mandatory. First, the voluntary **ISSB Standards** (IFRS S1 and S2), provide a global baseline for sustainability-related financial disclosures with a focus on investor needs. As of 2025, the jurisdictional adoption of ISSB Standards have reached to over thirty. Second, the mandatory **European Sustainability Reporting Standards,** developed under CSRD for in-scope entities that have been changed significantly by Omnibus Package. Third, the GRI Standards continues to remain one of the most widely used standards, particularly for impact-focused reporting for multi-stakeholder interests. In addition, several **other prominent initiatives** such as the **TCFD**, the **CDP** and the **SASB** continue to influence corporate disclosure practices and are often used in conjunction with those core standards. In conclusion, at this point, the major global developments that have taken place, particularly since 2023, strongly suggest that sustainability reporting is shifting from a voluntary to a regulatory obligation.

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# KEYNOTE SPEECH

# DISCLOSURE OF CLIMATE CHANGE MITIGATION AND ADAPTATION TARGETS BASED ON EUROPEAN SUSTAINABILITY REPORTING STANDARDS

**Erika Besuspariene***

**ABSTRACT**

**The new European Sustainability Reporting Standards (ESRS) require the disclosure of various sustainability accounting metrics. The requirement to disclose accounting metrics related to climate change mitigation and adaptation targets is a background for companies seeking to be sustainable. The aim of the present research is to assess how prepared EU companies are for the application of the ESRS, including company targets for climate change mitigation and adaptation. To design the research methodology, scientific and regulatory literature was analysed and empirical research was conducted using content analysis of the 2022-2024 sustainability reports of the five largest EU companies, and a disclosure index was calculated. The results showed that the majority of companies are ready to follow the new requirements of ESRS and some accounting metrics were presented before ESRS came into force.**

**Keywords:** Accounting Metrics, ESRS, Climate Change, Sustainability, Sustainability Reporting.

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## 1. INTRODUCTION

Climate change issues now affect everyone, and companies need to be more open about their climate change strategies. Some investors are changing their behaviour and want to shift their investments to sustainable companies. In response to investor interest, the International Financial Reporting Standards (IFRS) Trustees established the International Sustainability Standards Boards (ISSB) in 2021. As a result, the IFRS Sustainability Standards for sustainability disclosures came into force in 2023. IFRS standards are adapted for the European Union (EU) as the EU always seeks to address EU interests and market specifics. At the EU level, a new regulation was introduced in 2022, the Corporate Sustainability Reporting Directive (Directive (EU) 2022/2464 ..., 2022). Based on the new requirements for companies to prepare sustainability reports, the European Sustainability Reporting Standards (ESRS) were enforced in 2023 (Commission Delegated Regulation (EU) 2023/2772 …, 2023).

The ESRS is a complex document with new requirements for companies to disclose a range of information, including accounting metrics related to different sustainability issues. One of these is related to climate change mitigation and adaptation. The disclosure requirements (Commission Delegated Regulation (EU) 2023/2772 …, 2023) related to various accounting metrics such as energy consumption, greenhouse gas (GHG) emissions, pollution, water resources, etc. All these accounting metrics are linked to the same to get the data of companies and be able to see how companies' activities are related to the mitigation and adaptation of climate change.

The ESRS E1 is dedicated to climate change disclosure and here is the starting point for companies to disclose what targets they have to achieve the Paris Agreement on climate neutrality by 2050 (Commission Delegated Regulation (EU) 2023/2772 …, 2023). Being in line with the EU's climate change targets could be a challenge for the company. Some researchers also focus on climate change and its disclosure (Madaleno et al., 2023; Bui et al., 2021; Gulluscio et al., 2020; Jaworska, 2018).

Various studies have focused on industry or country level. The results of the research on the oil industry showed that climate-related disclosure varies over time and may reflect an increase or decrease in public attention in different years (Jaworska, 2018). The research on the forestry sector showed that ESRS requirements are in line with EU forestry strategies, including carbon sequestration, biomass cultivation, etc., so ESRS disclosure is very important for risk management in the forestry sector (Atanasov, Marinova, 2024). The researchers discuss the many issues facing the manufacturing sector, which will need to adapt to the new ESRS by being prepared to collect the necessary data, take account of the listed accounting metrics, monitor this data, adapt existing information technology (IT) systems, and increase digitalisation (Bataleblu et al., 2024).

Conflicting results have been found in other studies in different countries. The behaviour of Japanese and United States of America (USA) companies differs, with previous research showing that Japanese companies' reports are of high quality and disclose climate-related targets in detail (Park et al., 2023), while USA companies do not have such a clear distinction between high and low quality disclosure, and their climate-related targets often differ from those of other developed countries (Park et al., 2023; Toukabri et al., 2023). The study (Celli et al., 2024) of listed companies in Italy found that only 32% of the sample companies presented sustainability reports and clearly disclosed the company's strategy and sustainability targets.

The level of research on the topic highlights existing challenges related to country policy decisions, regulation, companies' mindset, and the fact that investors still receive fragmented information on climate-related targets.

**The aim of the present research** is to assess how prepared EU companies are for the application of the ESRS, including company targets for climate change mitigation and adaptation. In order to achieve the aim of the present research, the analysis of scientific and regulatory literature was carried out, the content analysis of the sustainability reports of the five largest EU companies for 2022-2024 was carried out, and an index of the level of disclosure of climate change mitigation and adaptation targets set by companies was calculated.

## 2.METHODOLOGY

The analysis of ESRS E1 (Commission Delegated Regulation (EU) 2023/2772 ..., 2023) allowed the identification of six accounting metrics related to the disclosure requirements of climate change mitigation and adaptation targets. These six accounting metrics (see figure 1) were used for the content analysis of the sustainability reports of EU companies.

| | |
|---|---|
| **GHG emission reduction targets** | • X1: GHG emission reduction targets in absolute value (tonnes of $CO_2e$) or percentage reduction from the base year.<br>• X2: GHG emission reduction targets for Scope 1, 2, and 3 emissions.<br>• X3: Five-year periodic updates of the base year from 2030 onwards, update the base year for its GHG emission reduction targets.<br>• X4: GHG reduction target values for 2030 and, if available, for 2050, with additional targets set every five years from 2030. |
| **1.5°C target of the Paris Agreement** | • X5: Statement on whether targets are science-based and aligned with the 1.5°C goal. |
| **Targets for decarbonisation** | • X6: Decarbonisation levers and their expected quantitative contributions, including energy efficiency, fuel switching, renewable energy use, material substitution, and product/process phase-out. |

**Figure 1. Accounting metrics related to the disclosure of climate change mitigation and adaptation targets**

*Source: compiled by the author according to Commission Delegated Regulation (EU) 2023/2772 ... (2023)*

As shown in Figure 1, the disclosure requirements for climate change mitigation and adaptation targets relate to GHG emissions, the 1.5°C target, and decarbonisation. However, the majority of the accounting metrics are linked to GHG emissions.

Bataleblu et al. (2024) noted that companies face challenges in collecting sustainability accounting metrics in real-time, which requires the use of digital technologies, including artificial intelligence (AI) to provide various key performance indicators (KPI), using different techniques such as observation, interview, questionnaire and database creation, and collaboration with external manufacturers and suppliers. As can be seen, the collection of metrics for sustainability accounting requires up-front preparation, so the first step for companies is to define the targets related to sustainability. For this reason, the present research focuses primarily on the disclosure of climate change mitigation and adaptation targets. This must be the background for companies to collect and disclose other sustainability accounting metrics in the future.

Seeking to identify the disclosure of accounting metrics related to the disclosure of climate change mitigation and adaptation targets, content analysis of sustainability reports was chosen. Various researchers (Celli et al., 2024; Broniewicz et al., 2024) often used content analysis in similar studies. Celli et al. (2024) noted that content analysis is suitable for accounting and finance research to analyse financial reports, regulatory documents, and other reports of companies, and the results of content analysis can provide valuable insights into the performance of companies. Broniewicz et al. (2024) focused on the ESRS guidelines and analysed environmental disclosure using content analysis, coding data as 0 if no information was disclosed and 1 if the information was disclosed. A similar methodology was used in the present research (see Figure 2).

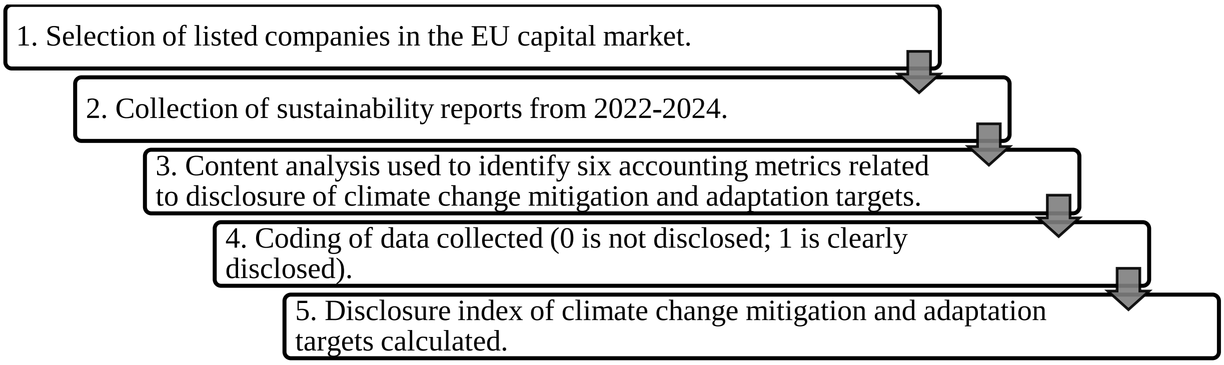


**Figure 2. Methodology of the present research**
*Source: compiled by the author.*

As previous research (Celli et al., 2024; Park et al., 2023; Toukabri et al., 2023) has shown, sustainability disclosure varies from country to country, so in order to get an initial picture of EU companies, it was decided to select companies from different EU Member States for this research. It was decided to select the top 5 largest companies in the EU. The top 5 companies were selected based on EU largest companies by market capitalisation in February 2025 (see Table 1).

**Table 1. The five largest companies in the EU**

| No. | Companies | Market capitalization (billions USD) | Country | Sustainability reports available at |
|---|---|---|---|---|
| TOP1 | Novo Nordisk A/S | 410.19 | Denmark | https://www.novonordisk.com/investors/annual-report.html |
| TOP2 | LVMH Moet Hennessy Louis Vuitton | 358.53 | France | https://www.lvmh.com/en/investors/esg |
| TOP3 | SAP SE | 333.50 | Germany | https://www.sap.com/integrated-reports |
| TOP4 | Hermès International | 297.37 | France | https://finance.hermes.com/en/a-value-creating-and-sustainable-french-model |
| TOP5 | ASML Holding N.V. | 283.77 | Netherlands | https://www.asml.com/en/company/sustainability |

*Source: compiled by the author according to FinanceCharts (2025).*

As shown in Table 1, the selected largest EU companies are located in four EU Member States. Sustainability reports were collected from company websites. The sustainability reports were referred to by different names due to changes in EU regulations and company policy: non-financial statement; non-financial performance statement; non-financial statement including information on sustainable activities;

sustainability statements; environmental, social, and governance (ESG) statements; environmental report; and responsibility report.

Content analysis was used to identify the disclosure of accounting metrics shown in Figure 2. After coding the collected data, the disclosure index (1) was calculated using a formula:

$$CCMAT_{it} = \frac{X1_{it}+X2_{it}+X3_{it}+X4_{it}+X5_{it}+X6_{it}}{6}; \quad (1)$$

Here:

CCMAT – disclosure index for climate change mitigation and adaptation targets.

X1, X2, X3, X4, X5, X6 – accounting metrics for climate change mitigation and adaptation targets.

After the calculation of the disclosure index for climate change mitigation and adaptation targets (CCMAT) and the situation of selected EU companies, the results are compared and the implications for the preparation of the ESRS are discussed.

## 3. FINDINGS

The empirical research was carried out between February and March 2025. The content analysis of selected companies' 2022-2024 sustainability reports was conducted, and the empirical research results are presented in Table 2.

**Table 2. Disclosure index for climate change mitigation and adaptation targets**

| Company | Year | X1 | X2 | X3 | X4 | X5 | X6 | **CCMAT** |
|---|---|---|---|---|---|---|---|---|
| TOP1 | 2024 | 1 | 1 | 0 | 1 | 1 | 1 | **0.83** |
| | 2023 | 1 | 1 | 0 | 0 | 1 | 0 | **0.50** |
| | 2022 | 1 | 1 | 0 | 0 | 1 | 0 | **0.50** |
| TOP2 | 2024 | 1 | 1 | 1 | 0 | 0 | 0 | **0.50** |
| | 2023 | 1 | 1 | 0 | 0 | 1 | 0 | **0.50** |
| | 2022 | 1 | 1 | 0 | 0 | 0 | 0 | **0.33** |
| TOP3 | 2024 | 1 | 0 | 0 | 0 | 1 | 1 | **0.50** |
| | 2023 | 1 | 0 | 0 | 0 | 1 | 0 | **0.33** |
| | 2022 | 1 | 0 | 0 | 0 | 1 | 0 | **0.33** |
| TOP4 | 2024 | 1 | 1 | 1 | 0 | 1 | 1 | **0.83** |
| | 2023 | 1 | 1 | 0 | 0 | 1 | 1 | **0.67** |
| | 2022 | 1 | 1 | 0 | 0 | 1 | 1 | **0.67** |
| TOP5 | 2024 | 1 | 1 | 1 | 1 | 1 | 1 | **1.00** |
| | 2023 | 1 | 1 | 1 | 1 | 1 | 0 | **0.83** |
| | 2022 | 0 | 1 | 1 | 1 | 1 | 0 | **0.67** |

*Source: Author's calculations using MS Excel.*

The empirical results show that the selected companies make adjustments to their sustainability reports to meet the requirements of the ESRS. This confirms the calculated CCMAT index (see Table 2) that the disclosure of climate change mitigation and adaptation targets is clearer in 2023-2024.

The empirical research results show that companies are already aware of the requirements of the Corporate Sustainability Reporting Directive (Directive (EU) 2022/2464..., 2022) and the ESRS (Commission Delegated Regulation (EU) 2023/2772..., 2023) and are taking action in advance. Although the ESRS comes into force in 2024, some companies have already disclosed some information in 2023.

It found that the most difficult issue for companies to address was disclosing GHG reduction targets for 2050, with additional targets set every five years. Almost all of the companies analysed have clearly defined

targets for reducing GHG emissions, either in absolute terms or as a percentage compared to the baseline year.
To summarise the empirical research results obtained, it can be said that the companies analysed are socially responsible and are adapting to the application of the ESRS at an early stage.

## 4. CONCLUSION

The ESRS targets for mitigating and adapting to climate change were selected for empirical research as the main basis for the future direction of companies moving towards higher social responsibility. This is because the achievement and disclosure of any other sustainability accounting metric starts with the company's strategy and set targets. The results of the empirical research showed that the selected EU companies are socially responsible and ready to apply the new EU regulations. Although the ESRS came into force in 2024, companies have already disclosed some of the information in 2022-2023. Not surprisingly, the disclosure index for climate change mitigation and adaptation targets was highest for the majority of the selected EU companies in 2024. The present research was a pilot study, as no recent sustainability reports were available during the empirical research period. In the future, similar research can be repeated with the inclusion of more ESRS accounting metrics as more company data becomes available.

## DATA AVAILABILITY STATEMENT

For this empirical study, the authors used publicly available data. In addition, all of the data collected by the authors can be made available upon reasonable request by contacting the corresponding author.

## ACKNOWLEDGEMENTS

Grammarly and DeepL were used for the linguistic editing of this manuscript. Grammar, clarity, and readability were improved using these tools.

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# KEYNOTE SPEECH

# THEORETICAL AND PRACTICAL CHALLENGES IN INTEGRATING SUSTAINABILITY REPORTING STANDARDS INTO THE FINANCIAL REPORTING OF AGRICULTURAL BUSINESSES IN THE REPUBLIC OF MOLDOVA

**Maria Cojocaru** [*]

**ABSTRACT**

**This study explores the theoretical and practical challenges associated with the integration of the European Sustainability Reporting Standards (ESRS) and the principle of double materiality into the financial reporting practices of agricultural businesses in the Republic of Moldova. Given the increasing international emphasis on sustainability disclosures, the research highlights the gaps between the current national financial reporting framework and the requirements of sustainable reporting. Particular attention is given to the specificities of agricultural enterprises, which are highly exposed to environmental and social risks. The paper proposes recommendations for aligning Moldova's reporting practices with European standards to enhance transparency, resilience, and sustainable development in the agricultural sector.**

**Keywords:** IFRS, ESRS, Double Materiality, Agribusiness, Financial Reporting, Republic of Moldova.

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## KEYNOTE SPEECH

# YEŞİL, DİJİTAL VE TOPLUMSAL DÖNÜŞÜM EKSENİNDE TÜRKİYE'NİN SÜRDÜRÜLEBİLİRLİK RAPORLAMASI YAKLAŞIMI VE MUHASEBE EĞİTİMİNDE YENİDEN YAPILANMA İHTİYACI

**Hasan Özçelik***

**ÖZET**

İnsanlık Endüstri 4.0'ın son dönemlerine yeşil, dijital ve toplumsal dönüşümden oluşan "Üçüz Dönüşüm Devrimi"ne tanıklık etmektedir. Nitekim bu dönüşüm sadece teknolojik bir ilerlemeden ibaret değildir. Eş zamanlı olarak ekonomik, çevresel ve toplumsal sistemleri yeniden yapılandırmayı gerektiren kapsamlı bir paradigma değişimidir. Bu doğrultuda Türkiye'nin Paris İklim Anlaşması'nı onaylaması akabinde 2053 net sıfır emisyon hedefi benimsemiş ve bu kapsamda Kamu Gözetimi, Muhasebe ve Denetim Standartları Kurumu (KGK) tarafından Türkiye Sürdürülebilirlik Raporlama Standartları (TSRS) yürürlüğe konulmuştur. Nitel bir yaklaşıma dayanan bu araştırma, literatür taraması ve mevcut uygulamaların içerik analizi yöntemiyle TSRS'lerin ilk uygulama yılı deneyimleri, kurumsal raporlamaya etkileri, sınırlı güvence denetimleriyle ilgili tartışmalar ve Türkiye'nin bu alandaki stratejik fırsatları ortaya çıkarmaya çalışmaktadır. Ayrıca, sürdürülebilirlik odaklı dönüşümün muhasebe mesleği ve muhasebe eğitimi üzerindeki yansımaları tartışılarak, geleneksel muhasebe eğitiminin güncel ihtiyaçlara cevap verebilmesi için öneriler sunulmaktadır.

**Anahtar Kelimeler**: Yeşil Dönüşüm, Dijital Dönüşüm, Toplumsal Dönüşüm, Üçüz Dönüşüm Devrimi, TSRS, Muhasebe Eğitimi.

## TURKEY'S SUSTAINABILITY REPORTING APPROACH AND THE NEED FOR RESTRUCTURING IN ACCOUNTING EDUCATION WITHIN THE AXIS OF GREEN, DIGITAL AND SOCIAL TRANSFORMATION

**ABSTRACT**

Humanity is witnessing the "Triple Transformation Revolution" consisting of green, digital and social transformation in the last periods of Industry 4.0. Indeed, this transformation is not only a technological advancement. It is a comprehensive paradigm shift that requires simultaneously restructuring economic, environmental and social systems. In this context, Turkey has adopted the 2053 net zero emission target after ratifying the Paris Climate Agreement and the Turkish Sustainability Reporting Standards (TSRS) have been put into effect by the Public Oversight, Accounting and Auditing Standarts Authority (POA). This research, based on a qualitative approach, attempts to reveal the experiences of the first year of implementation of TSRS, their effects on corporate reporting, discussions on limited assurance audits and Turkey's strategic opportunities in this area through literature review and content analysis of existing practices. In addition, the reflections of the sustainability-oriented transformation on the accounting profession and accounting education are discussed and suggestions are presented for traditional accounting education to meet current needs.

**Keywords:** Green Transformation, Digital Transformation, Social Transformation, Triple Transformation Revolution, TSRS, Accounting Education,

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## 1. GİRİŞ

Tarihsel olarak insanlık, tarım devrimi ve sanayi devrimi gibi iki büyük dönüşüm yaşamıştır. Özellikle Avrupa feodalizmi adıyla bildiğimiz pre-kapitalist düzenin ardından gelen sanayi devrimi insanlığın her alanda, kısa sürede ve geometrik olarak büyümesine sebep olmuştur (Keyder, 2014, s. 16). Ancak günümüzde bu dönüşümlerin de ötesine geçen bir süreç yaşanmaktadır. Bu süreci "Üçüz Dönüşüm Devrimi" olarak adlandırabiliriz. Oldukça kapsamlı olan, yaşamın her alanına dokunan bu dönüşüm; dijitalleşme, yeşil ve toplumsal dönüşüm başlıklarında şekillenmektedir. İnsanoğlunun sınırsız ihtiyaçların karşılanması ve daha fazla kazanma hırsı, sınırlı kaynakları olan dünyamızı her geçen gün daha yaşanmaz hale getiriyor. Gelişen teknoloji ile insanlık tarafından dünyanın sınırlı kaynakları sanki 1,75 dünya varmış gibi hızla tüketilmeye başlamıştır (Earth Overshoot Day, 2025). Ayrıca hızla gelişen teknolojilerin kullanımı gezegenimizi çevresel taşıma kapasitesinin sınırına ulaştırmıştır. Bu da iklim krizi, biyolojik çeşitlilik kaybı ve toprak sistemlerindeki bozulmalara sebep olarak geri dönülmez bir sürecin başlamasını tetiklemiştir. Dolayısıyla Üçüz Dönüşüm bir ihtiyaçtan ziyade zorunluluk halini almış ve ülkemizde bu alanda kapsamlı çalışmalar gerçekleştirmeye başlamıştır. Ancak, Üçüz Dönüşümün karmaşık gereksinimleri, yalnızca işletmelerin değil, muhasebe ve finans profesyonellerinin eğitim sistemlerinin de yeniden yapılandırılmasını gerektirmektedir. Bu makale, Türkiye'nin sürdürülebilirlik raporlaması yaklaşımını yeşil, dijital ve toplumsal dönüşüm ekseninde değerlendirerek, muhasebe eğitiminde ortaya çıkan yeniden yapılanma ihtiyacını incelemeyi amaçlamaktadır.

## 2. LİTERATÜR

Türkiye her alanda sahip olmak istediği öncülük rolüne Üçüz Dönüşüm alanında da sahip olmayı hedeflemektedir. Nitekim Türkiye'nin Paris İklim Anlaşmasını onaylaması; yeşil, dijital ve toplumsal dönüşümde kamu ve özel sektör olarak yoğun çabalar göstermesi bu isteğinin bir tezahürü olarak karşımıza çıkmaktadır. Bu kapsamda Türkiye'nin Üçüz Dönüşüme yönelik çıktılarının uluslararası standartlarla uyumlu bir şekilde uluslararası kamuoyuyla paylaşılması da büyük önem taşımaktadır. Bu doğrultuda 2021 yılında İskoçya Glasgow'da düzenlenen Birleşmiş Milletler (BM) 26. İklim Değişikliği Konferansı (COP26) neticesinde Uluslararası Finansal Raporlama Standartları (IFRS) Vakfı bünyesinde 3 Kasım 2021 tarihinde Uluslararası Sürdürülebilirlik Standartları Kurulu (ISSB) kurulmuştur. Mezkur kurul tarafından 26 Haziran 2023 tarihinde ise sürdürülebilirlikle ilgili standartlar yayımlanmış ve bu standartlar ülkemizde KGK tarafından da benimsenmiştir (Şirin ve Atıcı, 2023). Bu doğrultuda KGK, ISSB tarafından yayımlanan standartları Türkiye Sürdürülebilirlik Raporlama Standartları (TSRS) başlığıyla 29 Aralık 2023 tarihli Resmî Gazete'de yayımlayarak yürürlüğe koymuştur. Bu standartlar, KGK tarafından IFRS S1 ve S2 standartlarına tam uyumlu olarak hazırlanmış ve zorunlu uygulama kapsamı belirlenerek 1 Ocak 2024 itibarıyla uygulanmaya başlamıştır. KGK bu standartlar ile yalnızca bir raporlama yükümlülüğü getirmenin ötesinde işletmelerin yönetişim yapılarını, stratejilerini katkı sağlamayı hedeflemektedir. Böylelikle AB Yeşil Mutabakatı (EU Green Deal), Sınırda Karbon Düzenleme Mekanizması (CBAM) ve Kurumsal Sürdürülebilirlik Raporlama Direktifi (CSRD) gibi düzenlemelerle de uyum sağlanarak işletmelerimizin uluslararası rekabet gücüne katkı sunulacaktır. Dolayısıyla KGK tarafından atılan her adım oldukça önemlidir ve alınan erken aksiyonlar ülkemiz geleceğine katkı sağlayacaktır.

Bu kapsamda KGK stratejik olarak TSRS'lerin ilk uygulanması sırasında işletmelerin iç veri üretim süreçlerinin tanımlanması, yönetişim sistemlerinin oluşturulması, risk analizlerinin yapılması gibi alanlarda kolaylaştırıcı uygulamalara gitmiş (T.C. Cumhurbaşkanlığı Resmi Gazete, 2023) ve bu sayede de önemli ilerlemeler sağlanmıştır.

Ayrıca bu bilgilerin güvenilirliğinin temini için KGK tarafından güvence denetimleri zorunlu tutulmuş ve yine kolaylaştırıcı bir uygulama olarak ilk etapta sınırlı güvence denetimi yaklaşımı benimsenmiştir (KGK, 2025).

Sürdürülebilirlik raporlamasına ilişkin yapılan bütün araştırmalar çevresel ve sosyal etkilerin finansal sonumlar kadar önem taşıdığını ortaya koymaktadır (GRI, 2023; EFRAG, 2023). Yeşil dönüşüme ilişkin yapılan çalışmalar karbon ayak izinin azaltılması, doğa dostu enerji kullanımı ve iklim risklerinin finansal tabloları yakından etkilediğini ortaya koymuştur (TCFD, 2021; CDP, 2022). Dijital dönüşümün temelini oluşturan büyük veri, yapay zeka, nesnelerin interneti ve blockchain teknolojileri de veri toplama ve analiz yönünden iş dünyasını ve raporlamayı yeniden şekillendirmektedir (IFAC, 2021; OECD, 2023). Toplumsal dönüşümde ise sosyal adalet, çeşitlilik ve insan hakları gibi unsurlar öne çıkmış durumdadır (WBCSD, 2023). Muhasebe eğitiminin bu dönüşümleri kapsayacak şekilde yeniden yapılandırılması ise sıklıkla dile getirilmektedir (Gül, 2024; Sultanoğlu ve Özerhan, 2022).

## 3. METODOLOJİ

Bu bildiride betimleyici bir yaklaşım benimsenmiştir, ulusal ve uluslararası mevzuatlar (KGK, 2025; T.C. Resmi Gazete, 2023; EFRAG, 2023; GRI, 2023), akademik çalışmalar, üniversitelerin eğitim müfredatları (Yalçın vd., 2024; Gül, 2024; Sultanoğlu ve Özerhan, 2022) incelenmiş ve analiz edilmiştir. Ayrıca KGK'nın sürdürülebilirlik raporlamasına ilişkin yayınları değerlendirilmiştir (KGK, 2025). Araştırma, şu sorulara yanıt aramaktadır:

- Türkiye'nin sürdürülebilirlik raporlaması yaklaşımı, yeşil ve dijital dönüşüm hedefleriyle ne ölçüde uyumludur?
- Muhasebe eğitimi, bu dönüşüm süreçlerine nasıl adapte edilmelidir?
- Toplumsal dönüşüm, muhasebe mesleği ve eğitiminde hangi rolü oynamaktadır?

Makale, nitel bir yaklaşımla, literatür taraması ve mevcut uygulamaların içerik analizi yöntemine dayanarak, Türkiye'nin sürdürülebilirlik raporlamasındaki mevcut durumunu değerlendirip, muhasebe eğitiminde önerilen reform adımlarını tartışmaktadır.

Araştırma çerçevesi, sürdürülebilirlik raporlamasını yeşil, dijital ve toplumsal dönüşüm eksenlerinde ele alan kavramsal bir model üzerine kurulmuştur. Bu çerçeve, üç temel bileşeni içermektedir:

- Yeşil Dönüşüm: Paris İklim Anlaşması, Avrupa Yeşil Mutabakatı ve Türkiye'nin 2053 Net Sıfır Emisyon hedefleri bağlamında çevresel risk analizi ve karbon muhasebesi.
- Dijital Dönüşüm: Yapay zeka, büyük veri analitiği ve blok zinciri teknolojilerinin sürdürülebilirlik raporlamasında kullanımı.
- Toplumsal Dönüşüm: Sosyal adalet, iş gücü çeşitliliği ve etik değerlerin sürdürülebilirlik raporlamasına entegrasyonu.

Araştırma çerçevesi, TSRS, GRI ve ISSB standartlarından beslenmektedir. Muhasebe eğitiminde reform önerileri de mevcut müfredatların eksiklikleri üzerinden değerlendirilmiştir. Araştırmanın sınırlamaları, KOBİ'lerin sürdürülebilirlik raporlaması verilerinin eksikliği ve müfredat analizinin seçilmiş üniversitelerle sınırlı olmasıdır. TSRS'nin yeni yürürlüğe girmesi, uzun vadeli etkilerin değerlendirilmesini zorlaştırmaktadır.

## 4. BULGULAR

Türkiye'deki muhasebe eğitimi, geleneksel finansal raporlamaya odaklanmakta olup, sürdürülebilirlik raporlaması, TSRS, karbon muhasebesi ve yeşil finans gibi konularda yetersizdir (Sultanoğlu ve Özerhan, 2022). Bu da muhasebe mesleği ve eğitiminin de bir dönüşüm sürecine girmesini zorunlu kılmaktadır. Özellikle küresel krizler ve paydaşların sürdürülebilirlik baskıları muhasebe mesleğinin rolünü yeniden belirlemektedir. "Üçüz Dönüşüm Devrimi" kaynaklı risk ve fırsatlar, işletmelerin sürekliliği üzerinde doğrudan etkili olduğundan, finansal tabloların yanı sıra sürdürülebilirlik raporları da karar alma süreçlerinde kritik rol üstlenmekte ve bu da muhasebe meslek mensuplarının finansal bilgiler dışında finansal olmayan bilgileri de asli kullanıcıların bilgisine sunmasına sebep olmaktadır. Nitekim Dünya Ekonomik Forumu (WEF) tarafından hazırlanan "Geleceğin İşleri" raporunda da 2030

yılına kadar 170 milyon yeni işin ortaya çıkacağı ve 92 milyon işin ise ortadan kalkacağı belirtilmektedir.
Ayrıca mezkur raporda;

- 32 milyon yeni sürdürülebilirlik temelli iş fırsatının ortaya çıkacağı,
- İşverenlerin %77'sinin sürdürülebilir beceriler için eğitim faaliyetlerini destekleyeceği ve
- Bu faaliyetler için işletmelerin öncü rol oynayacağı ifade edilmektedir (WEF, 2025).

Dolayısıyla da bu süreç işletmelerin çevresel ayak izlerini, sosyal etkilerini ve yönetişim süreçlerini izlemelerine ve raporlamalarına olanak sağlayan ölçüm araçlarını içeren sürdürülebilirlik muhasebesini ön plana çıkarmaktadır (Gül, 2024). Dolayısıyla da muhasebe meslek mensuplarının bu alanlarda da bilgi sahibi olması hem kendileri hem de piyasa açısından gereklidir (Yalçın vd., 2024).
Bu doğrultuda muhasebe eğitiminde de bir dönüşüm ihtiyacı hasıl olmaktadır. Çünkü geleneksel muhasebe eğitimi ağırlıklı olarak finansal raporlamaya odaklanmaktadır. Son yıllarda her ne kadar üniversiteler tarafından sürdürülebilirlik konuları müfredata eklense de Çevresel, Sosyal ve Yönetişim (ÇSY) raporlaması, sürdürülebilirlik ve karbon muhasebesi ile sosyal etki ölçümü gibi konular mevcut müfredatta yeterince yer bulmamaktadır (Sultanoğlu ve Özerhan, 2022; Gül, 2024; Yaylalı, 2024). Dolayısıyla bu alanlarda kapsamlı çalışmaların yapılması gerekmektedir. Bu kapsamda muhasebe eğitiminin yeniden yapılandırılması için aşağıdaki öneriler sunulmaktadır:

- Müfredat Genişletme: Etik, sosyal adalet ve çeşitlilik yönetimi, sürdürülebilirlik muhasebesi, karbon muhasebesi, ÇSY raporlaması ve sosyal etki ölçümü gibi konular hem teorik hem uygulamalı derslerle müfredata dahil edilmelidir.
- Yöntemsel Çeşitlilik: Öğrencilerin analitik ve eleştirel düşünme becerilerini geliştirecek vaka analizleri, simülasyonlar ve proje tabanlı öğrenme teknikleri yaygınlaştırılmalıdır.
- Yetkinlik Odaklı Eğitim: Stratejik düşünme, kriz yönetimi, öngörü geliştirme ve etik karar alma gibi duyarlılıkla ilişkili becerilere yönelik içerikler geliştirilmeli ve ölçülebilir hale getirilmelidir.
- Teknoloji Entegrasyonu: Yapay zeka, veri analitiği ve sürdürülebilirlik yazılımlarına ilişkin modüller, çağdaş iş dünyasının gereksinimleriyle uyumlu olarak eğitim programlarına entegre edilmelidir.
- Paydaş İş birliği: Üniversiteler, meslek örgütleri, özel sektör ve kamu kurumları arasında sürdürülebilirlik odaklı ortak projeler ve eğitim inisiyatifleri teşvik edilmelidir.

Ayrıca TSRS'ler sayesinde karbon emisyonlarının ölçülmesi ve raporlanmasında artışlar olmuştur. İklim kanunu ile sınırda karbon düzenlemesi iş dünyasında raporlama sistemini yakından etkilemektedir (KGK, 2025). Blockchain ve veri analitiği raporlama verilerinin şeffaflığını ve kalitesini arttırmaktadır ve KGK dijital raporlama teknolojilerini benimsemekte ve desteklemektedir (OECD, 2023, KGK, 2025). Sosyal etki göstergeleri artık raporlamalarda kendini göstermektedir (WBCSD, 2023).
Politika önerileri açısından ise sürdürülebilirlik raporlamasını zorunlu hale getiren mevzuatlar yaygınlaştırılmalı ve KGK'nın düzenleyici rolü güçlendirilmelidir. KGK tarafından atılan kıymetli adımlar raporlama ve denetim yapacak nitelikli insan gücüne olan ihtiyacını ortaya çıkarmıştır. Yeşil yatırımların finansal raporlamada avantajlı hale gelmesi teşvik edilmeli, denetim ve raporlama alanın çalışan profesyonellerin sürekli bilgilerini güncellemeleri ve eğitilmeleri sağlanmalıdır. Bu ihtiyacın giderilmesi ve yeşil yakalı kapasitesinin artırılması için ise yine KGK tarafından kapasite geliştirme programı başlatılmıştır. Sonuç olarak "Üçüz Dönüşüm Devrimi"nin bir parçası olan sürdürülebilirlik raporlaması ve denetimi alanlarında KGK küresel olarak öncü bir rol üstlenmiş ve bu bildirinin de konusunu oluşturan muhasebe eğitiminin güncel ihtiyaçlara cevap verebilmesi için kapsamlı çalışmalar gerçekleştirmiştir.

## 5. SONUÇ

"Üçüz Dönüşüm Devrimi" muhasebe mesleğinin ve muhasebe eğitiminin geleceğini şekillendirecek belirleyici unsurlardan birisi haline gelmiştir. Ancak bu kavram yalnızca teorik bir hedef olarak ele alınmamalı; yeşil, dijital ve toplumsal dönüşümü içeren bütünleşik bir bakış açısını sunmalıdır. Bu bütünleşik bakış açısının temini ise eğitim politikaları, müfredat düzenlemeleri, öğretim yöntemleri, dijital dönüşüm, yeşil dönüşüm ve yaşam boyu öğrenme anlayışıyla toplumsal dönüşüm sayesinde somut adımlara dönüştürülmelidir. Bu sebepten ötürü akademik camia, iş dünyası ve muhasebe meslek mensuplarının bu alandaki ortak bir vizyon doğrultusunda harekete geçmesi gerekmektedir. Böylelikle toplumsal ölçekte bir dönüşüm sürecine öncülük edilmiş olacak ve muhasebe mesleği yalnızca işletmelere hizmet eden bir araç olmaktan çıkarak, toplumun geneline ve çevreye katkı sunan daha kapsayıcı ve sorumlu bir meslek halini alacaktır.

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# LEGAL FRAMEWORK IN TÜRKİYE FOR THE TRANSITION FROM GREENWASHING TO GREEN TRUST

**Ayşe Banu Başar*, Seval Kardeş Selimoğlu****

**ABSTRACT**

**Although the pressures of the climate crisis have prompted businesses to assume greater environmental responsibility, greenwashing has emerged as a significant issue. Some companies attempt to present their environmental practices more positively than they truly are by providing misleading, selective, or exaggerated information. This practice undermines the reliability of financial reporting, erodes investor confidence, and weakens the effectiveness of internal audit processes. In contrast to this challenge, the concept of *green trust* reflects a company's credible, transparent, and verifiable commitment to environmental responsibility. Achieving a shift from greenwashing to green trust requires comprehensive reporting, independent assurance, alignment with international standards, and concrete environmental actions. In Turkiye, regulatory developments are underway to support this transition. The Public Oversight Authority (KGK) has made sustainability reporting and assurance audits mandatory through the introduction of TSRS 1 and TSRS 2. The Capital Markets Board (CMB) aims to enhance transparency by issuing guidelines for sustainable financial instruments and implementing a "comply or explain" framework for reporting. Meanwhile, the Banking Regulation and Supervision Agency (BRSA) guides the banking sector through sustainability action plans and introduces measures to mitigate greenwashing risks. As a result, Turkiye's regulatory landscape in the field of sustainability is becoming increasingly robust, laying the foundation for restoring trust in corporate sustainability practices.**

**Keywords:** Sustainability Reporting, Greenwashing, Green Trust, Corporate Transparency, Legal Regulations and Compliance

## YEŞİL MAKYAJLAMADAN YEŞİL GÜVENE GEÇİŞ KAPSAMINDA TÜRKİYE'DE YASAL ÇERÇEVE

**ÖZET**

**İklim krizinin yarattığı baskılar, işletmeleri çevresel sorumluluk almaya yönlendirirken, bazı şirketlerin bu alandaki faaliyetlerini olduğundan daha olumlu göstermek amacıyla başvurduğu yeşil makyajlama (greenwashing) ciddi bir sorun olarak ortaya çıkmaktadır. Yeşil makyajlama, şirketlerin çevresel performansları hakkında yanıltıcı, seçici veya abartılı bilgi sunmasıyla kamuoyunda çevreye duyarlı bir imaj yaratma çabasıdır. Bu durum, finansal raporlamanın güvenilirliğini zedelemekte, yatırımcı güvenini sarsmakta ve iç denetim süreçlerinin etkinliğini azaltmaktadır. Bu olumsuz tabloya karşın, yeşil güven kavramı, işletmelerin çevresel sorumluluklarına yönelik güvenilir, şeffaf ve doğrulanabilir bir duruş sergilemesini ifade etmektedir. Yeşil makyajlamadan yeşil güvene geçiş; kapsamlı raporlama, bağımsız denetim, uluslararası standartlara uyum ve esaslı çevresel eylemlerle mümkündür. Türkiye'de bu geçişi destekleyen yasal adımlar atılmaktadır. KGK, TSRS 1 ve TSRS 2 ile sürdürülebilirlik**

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**raporlamasını ve güvence denetimini zorunlu hale getirmiştir. SPK, sürdürülebilir finansal araçlara yönelik rehberler ve "uy ya da açıkla" esaslı raporlama şablonlarıyla şeffaflığı artırmayı hedeflemektedir. BDDK ise sürdürülebilirlik eylem planlarıyla bankacılık sektörünü yönlendirmekte ve yeşil makyajlama riskine karşı önlemler geliştirmektedir. Sonuç olarak, yeşil makyajlamayla mücadelede Türkiye'deki yasal çerçeve giderek güçlenmekte; bu da kurumsal sürdürülebilirliğe olan güvenin yeniden inşasına zemin hazırlamaktadır.**

**Anahtar kelimeler:** Sürdürülebilirlik Raporlaması, Yeşil Makyajlama, Yeşil Güven, Kurumsal Şeffaflık, Yasal Düzenlemeler ve Uyum

VIII. INTERNATIONAL SYMPOSIUM ON ACCOUNTING AND FINANCE
Cohosted by MUFAD and Mudanya University
Faculty of Arts and Social Sciences
25-26 July 2025- ONLINE

# GREENWASHING PRACTICES IN SUSTAINABILITY REPORTS AND THEIR FINANCIAL REFLECTIONS: INTERNATIONAL CASE STUDY ANALYSIS

**Arman Aziz Karagül*, Seval Kardeş Selimoğlu****

**ABSTRACT**

**This study examines greenwashing practices in corporate sustainability reports and their financial implications through international case analyses. Greenwashing refers to companies making misleading environmental claims to appear more sustainable than they actually are. While such disclosures can enhance reputation and competitive advantage in the short term, they often lead to significant financial penalties, reputational damage, and loss of investor trust when exposed. The study uses secondary data, including academic sources and corporate statements, to demonstrate these effects. The findings highlight the need for stronger regulation, increased financial and environmental literacy, and more transparent reporting standards to combat greenwashing effectively.**

**Keywords:** Greenwashing Practices, Financial Implications, Sustainability Reporting

## SÜRDÜRÜLEBİLİRLİK RAPORLARINDA YEŞİL YIKAMA UYGULAMALARI VE FİNANSAL YANSIMALARI: ULUSLARARASI VAKA ÇALIŞMASI ANALİZİ

**ÖZET**

**Bu çalışma, kurumsal sürdürülebilirlik raporlarındaki yeşil aklama uygulamalarını ve bunların finansal etkilerini uluslararası vaka analizleri aracılığıyla incelemektedir. Yeşil aklama, şirketlerin gerçekte olduklarından daha sürdürülebilir görünmek için yanıltıcı çevresel iddialarda bulunmalarını ifade eder. Bu tür açıklamalar kısa vadede itibarı ve rekabet avantajını artırabilse de, ifşa edildiklerinde genellikle önemli mali cezalara, itibar kaybına ve yatırımcı güveninin kaybına yol açar. Çalışma, bu etkileri ortaya koymak için akademik kaynaklar ve şirket açıklamaları da dahil olmak üzere ikincil veriler kullanmaktadır. Bulgular, yeşil aklamayla etkili bir şekilde mücadele etmek için daha güçlü düzenlemelere, artan finansal ve çevresel okuryazarlığa ve daha şeffaf raporlama standartlarına ihtiyaç duyulduğunu vurgulamaktadır.**

**Anahtar Kelimeler:** Yeşil Aklama Uygulamaları, Finansal Etkiler, Sürdürülebilirlik Raporlaması.

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# THE EVOLUTION OF GREEN ACCOUNTING STUDIES: A BIBLIOMETRIC REVIEW OF WOS-INDEXED PUBLICATIONS (1992-2025)

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**ABSTRACT**

**In this study, we analyzed a total of 162 publications indexed in the Web of Science database (SCI-Expanded, SSCI, ESCI) between 1992 and 2025. The primary aim of the research is to identify prominent themes in the field of green accounting and to map the developmental trajectory of the related literature. For this purpose, a bibliometric analysis was conducted using the VOSviewer software, and key themes were visualized. The main hypothesis of the study posits that the literature on green accounting has been gaining increasing significance over time. The findings reveal a marked rise in academic interest in this area, particularly after 2019. Notably, the years 2023 and 2024 stand out as the most productive periods, with 15 and 16 publications respectively. Maunders and Burritt (1991) are identified as pioneers in introducing the concept of green accounting to the literature. Additionally, multi-authored studies (e.g., Brentrup et al., 2020) and highly cited works (e.g., Muller & Mendelsohn, 2007) have played a significant role in shaping the field. Keyword analysis indicates that "green accounting," "sustainability," and "environmental accounting" are among the most frequently used terms. At the country level, the United States, Canada, and China lead in both publication count and citation impact. At the institutional level, McGill University, Yale University, and Amity University have made substantial contributions to the literature. The findings demonstrate that green accounting is gaining global relevance and support the central hypothesis of this study. In conclusion, this research offers a comprehensive mapping of the green accounting literature and provides a guiding framework for future studies in the field.**

**Keywords:** Green accounting, Sustainability, Environmental Accounting, Sustainable Development, Ecosystem Services

## YEŞİL MUHASEBE ÇALIŞMALARININ EVRİMİ: WOS ENDEKSLİ YAYINLARIN BİBLİYOMETRİK BİR İNCELEMESİ (1992-2025)

**ÖZET**

**Bu çalışmada, 1992–2025 yılları arasında Web of Science veri tabanında (SCI-Expanded, SSCI, ESCI) indekslenen toplam 162 yayın analiz edilmiştir. Araştırmanın temel amacı, yeşil muhasebe alanında öne çıkan temaları ortaya koymak ve bu literatürün gelişimsel seyrini haritalamaktır. Bu doğrultuda VOSviewer yazılımı kullanılarak bibliyometrik analiz yapılmış ve ana temalar görselleştirilmiştir. Çalışmanın ana hipotezi, yeşil muhasebe literatürünün zaman içinde giderek daha fazla önem kazandığı yönündedir. Bulgular, özellikle 2019 yılı sonrasında alana yönelik akademik ilginin belirgin biçimde arttığını göstermektedir. Nitekim 2023 ve 2024 yılları, sırasıyla 15 ve 16 yayınla en üretken dönemler olarak öne çıkmaktadır. Yeşil muhasebe kavramının literatüre tanıtılmasında Maunders ve Burritt'in (1991) öncü rol oynadığı; çok yazarlı çalışmaların (örneğin Brentrup ve ark., 2020) ve yüksek atıf alan yayınların (örneğin Muller & Mendelsohn, 2007) literatürde önemli yer tuttuğu tespit edilmiştir. Anahtar kelime analizinde ise "yeşil muhasebe", "sürdürülebilirlik" ve "çevresel muhasebe" terimlerinin en sık kullanılan**

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**kavramlar arasında yer aldığı belirlenmiştir. Ülke düzeyinde ABD, Kanada ve Çin; kurumsal düzeyde ise McGill Üniversitesi, Yale Üniversitesi ve Amity Üniversitesi yayın sayısı ve atıf düzeyi açısından ön plana çıkmaktadır. Elde edilen bulgular, yeşil muhasebe konusunun küresel ölçekte giderek daha fazla önem kazandığını ortaya koymakta ve çalışmanın temel hipotezini desteklemektedir. Sonuç olarak, bu araştırma yeşil muhasebe literatürünü bütüncül bir bakış açısıyla haritalamakta ve gelecek çalışmalara yön verecek bir çerçeve sunmaktadır.**

**Anahtar Kelimeler:** Yeşil Muhasebe, Sürdürülebilirlik, Çevre Muhasebesi, Sürdürülebilir Kalkınma, Ekosistem Hizmetleri.

## 1. INTRODUCTION

In recent years, environmental sustainability has come to play a critical role in the success of businesses. Increasing resource scarcity, climate change and environmental regulations are driving firms towards green practices. In this context, concepts such as green accounting, green innovation and green intellectual capital come to the fore. Green accounting is a system that increases transparency by integrating companies' environmental costs and benefits into financial reporting (Al-Dhaimesh 2020: 165; Astuti, Widyastuti, and Ahmar 2022: 103). This approach contributes to sustainable development while ensuring resource efficiency (Ulupui et al. 2020: 744). On the other hand, green innovation gives firms a competitive advantage by developing environmentally friendly products and processes (Xie vd., 2019). However, these innovations can pose challenges in the short term due to high start-up costs (Zhang 2024: 1050). Green intellectual capital refers to the firm's capacity for environmentally friendly knowledge and innovation. This concept both reduces environmental risks and strengthens financial performance by optimizing resource use (Malik et al. 2020: 2).

## 2. CONCEPTUAL FRAMEWORK

This section discusses the concept of green accounting and explains its relationship with environmental accounting, environmental cost management accounting (ECMA) and green innovation.

### 2.1. Green Accounting and Environmental Accounting

Maunders & Burritt (1991), were pioneers in introducing the concept of green accounting. There are many definitions of green accounting in the literature. Singh et al. (2019), defined green accounting as the environmental impact that occurs during all production and corporate activities practiced by companies (Singh et al. 2019: 482). According to the US Environmental Protection Agency, green accounting is identifying and prioritizing environmental costs, quantitatively or qualitatively assessing these costs, and incorporating them into business decisions (Datta and Deb 2012: 103). In other words, green accounting refers to the production processes of companies to ensure sustainability by using resources more efficiently and effectively. This approach ensures that the company's development is aligned with its environmental functions and benefits the local community. The implementation of green accounting includes concepts such as saving materials, land and energy. According to De Beer & Friend (2006) green accounting is an approach to restoring ecosystems and sustainable use of resources.

Environmental accounting and green accounting overlap to a large extent. In both concepts, the goal is the same but the means are different. Both concepts support sustainability, but environmental accounting emphasizes internal management while green accounting emphasizes external reporting. Environmental accounting is not a uniform field and is very challenging to research. Studies in this area are often based on the belief that there are serious problems with traditional accounting and that researchers need to find new ways to remedy this situation (Owen, Gray, and Bebbington 1997: 181).

Environmental accounting is an accounting system used to identify, measure and analyze the environmental impacts of businesses and the financial consequences of these impacts. This system contributes to both the environment and the business by monitoring resource utilization and waste generation (De Beer and Friend 2006: 549).

Finally, Owen et al. (1997), emphasize that public disclosure of information on the social and environmental impacts of corporate activities is important for organizational transparency, stakeholder accountability and strengthening participatory democracy. In this context, it draws attention to the necessity of reintroducing a social justice dimension to existing environmental reporting practices. Similarly, Jones (2010) states that companies should clearly disclose their environmental impact and sustainability efforts. Companies should clearly define the environmental goals they want to achieve and present their achievements in this area to stakeholders by having them verified by independent institutions (Jones 2010: 134).

### 2.2. Green Accounting and Environmental Cost Management Accounting (ECMA)

Environmental Cost Management Accounting (ECMA) enables businesses to monitor their environmental impacts financially. In this way, resources are used efficiently, waste is reduced and environmentally friendly production is supported. As a sub-branch of green accounting, ECMA contributes to making environmentally sensitive decisions. In the study of the brick sector in Vietnam, the following recommendations were made for the implementation of ECMA: ECMA training should be provided to accounting and environmental departments. ECMA should be integrated into environmental management systems. Cleaner production and waste management projects should be promoted. This approach increases sustainability while reducing environmental costs (Le and Nguyen 2019: 119).

### 2.3. Green Accounting and Green Inovation

While green innovation and green accounting both serve sustainability goals, they are related but distinct concepts. Their focus and application areas are different. Green innovation has a positive effect on environmental responsibility and management accounting practices and increases firm performance. On the other hand, green accounting has no significant effect on environmental management accounting and firm performance (Dwi Putra et al. 2025: 10).

The data of publicly traded companies in China were analyzed by content analysis method and it was found that green process innovation positively affects green product innovation and both types of innovation increase the financial performance of firms. Green innovation is an approach that promotes sustainability by developing new technologies, products and processes that reduce environmental impacts. Investing in green process and product innovations gives firms a competitive advantage, while creating a green image positively affects consumer preferences. However, more comprehensive policies should be developed to increase the effectiveness of government support (Xie, Huo, and Zou 2019: 704). While these innovations increase resource efficiency, they often require significant initial investments. Innovations also reduce fossil fuel demand and emissions in the long run. In the short term, however, there are high costs (in the R&D process) and the risk of a “green paradox” (Zhang 2024: 1050). These concepts play a complementary role in the sustainability-oriented transformation of businesses (Astuti and Ahmar 2025: 1).

### 2.4. Green Accounting and Greenwashing

Today, as environmental awareness increases, companies consider environmental protection within the scope of social responsibility and tend towards green accounting practices in this direction. However, this trend has given rise to the risk of “greenwashing”. Greenwashing is when companies mislead consumers by overstating their environmental performance. This is usually done by emphasizing positive information and hiding negative information. While green accounting aims to ensure accurate and transparent reporting of environmental impacts, greenwashing can undermine the credibility of these processes. Increasing consumer awareness and regulatory pressures are driving companies towards realistic and honest sustainability reporting (Erbuğa and Atağan 2023).

## 3. LITERATURE REVIEW

### 3.1. The Impact of Green Accounting on Financial Performance of Firms: Supportive and Critical Views

There are different views in the literature on the impact of green accounting practices on firms' financial performance. Zhao, Mou, & Yu (2025), reported that transparent disclosure of green accounting information positively affects financial performance in Chinese heavy industry firms. Khan & Gupta (2024) argue that artificial intelligence improves data analysis and decision-making processes by supporting green accounting practices.

On the other hand, Dwi Putra et al. (2025) stated that green innovation directly contributes to financial performance in manufacturing firms in Indonesia, but green accounting and environmental management accounting have no direct effect. Ratmono et al. (2024) examined the effect of green accounting on environmental performance and environmental performance on corporate social responsibility disclosures with data from 95 publicly traded firms in Indonesia between 2017 and 2021. The results reveal that green accounting improves environmental performance and this performance positively affects CSR disclosures.

Raka Sukawati et al. (2020) showed that green accounting practices in the hotel sector have positive effects on corporate reputation. The results of the research revealed that environmental awareness, participation and reporting contribute to the formation of the hotels green reputation.

Khan & Gupta (2023), found in their study that Twitter users have a generally positive approach to green accounting, but they see challenges in implementation. While the most prominent concern was “corporate green laundering”, the potential use of artificial intelligence in this area drew attention. The UK has been the leading country in the development of green accounting, while the “Conference of the Parties” COP26 (26th Meeting of the Conference of the Parties) has been the target of intense criticism. In summary, they emphasized that the implementation of green accounting standards can be complex.

Agyemang et al. (2023), used secondary data from 34 publicly traded mining companies operating between 2000 and 2018 and reported that green accounting in China had a positive effect on return on equity (ROE), but there was no significant relationship with return on assets (ROA). Endiana et al. (2020) revealed that green accounting practices within the scope of corporate sustainability management system positively affect financial performance in Indonesia.

### 3.2. Challenges in Implementing Green Accounting

The implementation of green accounting in developing countries faces various challenges. Khan, Gupta, & Gupta (2024) stated that in the case of India, firms do not invest enough in this area due to the lack of clear green accounting standards and insufficient government incentives. Rahaman et al. (2024) stated that green accounting reporting in the pharmaceutical and textile sectors in Bangladesh depends on company characteristics and external factors, but environmental financial information is often ignored. In their study, the implementation of green accounting practices in the pharmaceutical sector proved to be more effective than in the textile sector.

Erbuğa & Atağan (2023) argue that some large companies focus only on improving their image instead of fulfilling their environmental commitments, which reduces the credibility of green accounting.

Gonzalez & Peña-Vinces (2023) argue that firms in Colombia struggle to integrate environmental data into the accounting system and that existing structural deficiencies hinder this process. Islam & Hossain (2022) also emphasize that environmental information disclosures by engineering firms in Bangladesh are often superficial, supporting the criticism that green accounting in developing countries is often practiced “for show”.

Novovic Buric et al. (2022) stated that there are positive attitudes towards green accounting in tourism enterprises in Montenegro, but knowledge levels depend on socio-demographic factors, which shows the importance of education and structural barriers.

Dhar, Sarkar, & Ayittey (2022) showed that green accounting and social responsibility reporting can support sustainable development in polluting companies in Bangladesh, indicating that challenges can be overcome with the right practices.

### 3.3. Development and Application Areas of Green Accounting

There are also studies that examine green accounting practices through agricultural and environmental indicators. Quemada et al. (2020), analyzed the environmental performance of different farms with nitrogen (N) indicators and emphasized the importance of setting targets for sustainable production. In their study, they examined the agricultural performance of 1240 farms in Europe through indicators such as nitrogen (N) use efficiency, excess nitrogen amount and nitrogen output in agricultural products. The study makes an important contribution in terms of monitoring natural resources and promoting sustainable agricultural practices within the scope of green accounting.

Marie (2018), proposed an accounting framework that allocates the costs of pollution damages to different sources. This method makes it possible for governments to include polluters in financial responsibility through environmental taxes and fees, making the environmental impacts of businesses transparent.

Cairns (2018) questioned the compatibility of green accounting with classical financial accounting and economic theories and emphasized the importance of including capital gains in net income in the valuation of environmental capital. In his study, he states that the depreciation practice in green accounting does not fully fulfill the “economic depreciation” function of classical depreciation because it has a broader “environmental” perspective.

Hens et al. (2018) stated that green accounting should be considered within the framework of “Cleaner Production” and Corporate Social Responsibility (CSR). In summary, they emphasize that green accounting has become an increasingly important and frequently used tool in the process of measuring and evaluating the environmental and social impacts of cleaner production.

Solovida & Latan (2017) showed that environmental management accounting mediates environmental performance, which makes green accounting an important tool for companies to achieve their sustainability goals. In summary, green accounting has been identified as a mediating and supporting tool in improving the environmental performance of companies.

Green accounting is an approach that aims to consider ecosystem services provided by nature and environmental assets within economic systems. In their study, Obst, Hein, & Edens (2016) investigated how environmental values can be integrated into economic accounts. In particular, they drew attention to the methodological and conceptual challenges faced when calculating the economic value of ecosystem services. The authors argue that ecosystems should be included in the production process in order to establish a more accurate and holistic relationship between nature and the economy. They also emphasize that for this process to be successful, economists, ecologists and accountants should work together. Gonzalez & Peña-Vinces (2023), questioned the role of the academic curriculum, stating that green accounting is not sufficiently included in accounting education at universities.

Finally, Wu & Heberling (2016) show how green accounting can be used to integrate economic and environmental data by calculating Green Net National Product (GNNP) in the case of Puerto Rico. Such studies contribute to the development of both theoretical and practical dimensions of green accounting.

## 4. METHODOLOGY OF RESEARCH

In this section, the scientific foundations of the study are explained by detailing the database, sampling process, analysis tools and methodological approaches used for the purpose of the study.

### 4.1. Purpose of the Study

The main purpose of this study is to examine the scientific literature in the field of green accounting with systematic and visual analysis methods and to reveal the trends, development process, collaboration networks and main research topics of the studies conducted in this field. From the 272 studies obtained as a result of searching the Web of Science (WoS) database with the keyword "green accounting" in all fields, only 201 studies in the article type were filtered. In order to analyze publications with high scientific quality, only 162 articles indexed in SSCI, SCI-Expanded and ESCI indexes were included in the study.

Published between 1992 and 2025, these studies were evaluated by bibliometric analysis methods using VOSviewer software. With this analysis, various variables such as the most productive authors, institutions, countries, most cited publications, key keywords and thematic foci were analyzed supported by visual maps. The study aims to contribute to understanding the structure and evolution of knowledge in the field of green accounting.

### 4.2. Limitations of the Study and Future Studies

This study has some limitations. First of all, only WoS (Web of Science) database was used for literature review and other international databases (Scopus, Google Scholar, etc.) were excluded from the scope of the study. Furthermore, only “article” type publications were analyzed; book chapters, proceedings, review articles and other types of documents were not included in the evaluation.

Another limitation is that only articles published in journals included in SSCI, SCI-Expanded and ESCI indexes were included in the analysis. This may lead to the exclusion of some publications that are not included in WoS but may contribute to the field. However, since this analysis was conducted as of March 2025, current studies to be published later could not be included in this evaluation.

In future research, using different databases together, analyzing a wider range of document types and combining content analysis with bibliometric analysis will allow for more comprehensive results. In addition, in-depth content analyses can be conducted on the thematic clusters obtained, and gaps and areas of development in the green accounting literature can be revealed in more detail.

### 4.3. Findings

In this section, 162 scientific publications obtained from the Web of Science (WoS) database with the keyword “green accounting” are analyzed using bibliometric analysis methods. The findings of the study are presented within the framework of the distribution of publications by years, collaboration structures, most influential authors, citation status, keyword density, institution and country-based contributions, and bibliographic match analysis.

#### 4.3.1. Analysis of the Distribution of Publications on Mobbing by Years

A total of 162 articles published in the WoS database between 1992 and 2025 were analyzed. According to the findings, while a limited number of studies in the field of green accounting were published in the early 1990s, there has been a significant increase since the 2000s. Especially in the period after 2019, a rapid increase in the number of publications in the literature has been observed. With 15 publications in 2023 and 16 publications in 2024, the most intensive production was realized in this field. This increase shows that sustainability and environmental sensitivity issues are becoming increasingly important in firms' accounting practices and academic literature.

**Table 1.** Annual Publication Distribution According to WoS Data (1992-2025)

| Years | Publications | Years | Publications | Years | Publications |
|---|---|---|---|---|---|
| **1992** | 3 | **2005** | 3 | **2016** | 5 |
| **1994** | 1 | **2006** | 6 | **2017** | 2 |
| **1995** | 2 | **2007** | 7 | **2018** | 4 |
| **1997** | 4 | **2008** | 5 | **2019** | 9 |
| **1998** | 5 | **2009** | 6 | **2020** | 10 |
| **1999** | 4 | **2010** | 3 | **2021** | 7 |
| **2000** | 2 | **2011** | 3 | **2022** | 10 |
| **2001** | 3 | **2012** | 6 | **2023** | 15 |
| **2002** | 2 | **2013** | 7 | **2024** | 16 |
| **2003** | 1 | **2014** | 2 | **2025** | 3 |
| **2004** | 4 | **2015** | 2 | | |

**Source:** WoS

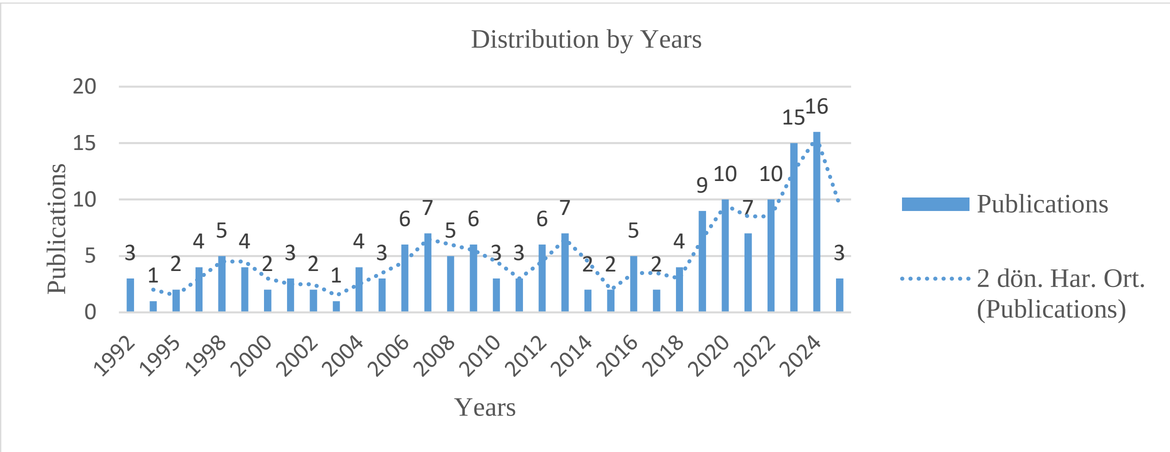



**Figure 1.** Analysis of the Number of Publications by Years Graphical Display

### 4.3.2. Co-authorship Analysis in the Field of Green Accounting

The first study that stands out according to the total link strength in the co-authorship analysis in the field of green accounting is “Exploring nitrogen indicators of farm performance among farm types across several European case studies” with 11 authors. The study stands out with its integration of green accounting into the agricultural sector, monitoring the use of natural resources (especially nitrogen) and making the environmental costs of agricultural activities visible.

**Table 2.** Top Authors by Total Link Strength in Green Accounting Publications

| Author | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Frank Brentrup | 1 | 131 | 10 |
| Cathal Buckley | 1 | 131 | 10 |
| Sophie Foray | 1 | 131 | 10 |
| Olivier Godinot | 1 | 131 | 10 |
| Søren Kolind Hvid | 1 | 131 | 10 |
| Lars Stoumann Jensen | 1 | 131 | 10 |
| Luis Lassaletta | 1 | 131 | 10 |
| Jouke Oenema | 1 | 131 | 10 |

| Author | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Oene Oenema | 1 | 131 | 10 |
| Miguel Quemada | 1 | 131 | 10 |
| Karl G. Richards | 1 | 131 | 10 |
| Others (333) | 1,14 | 26,58 | 2,47 |

**Source:** WoS

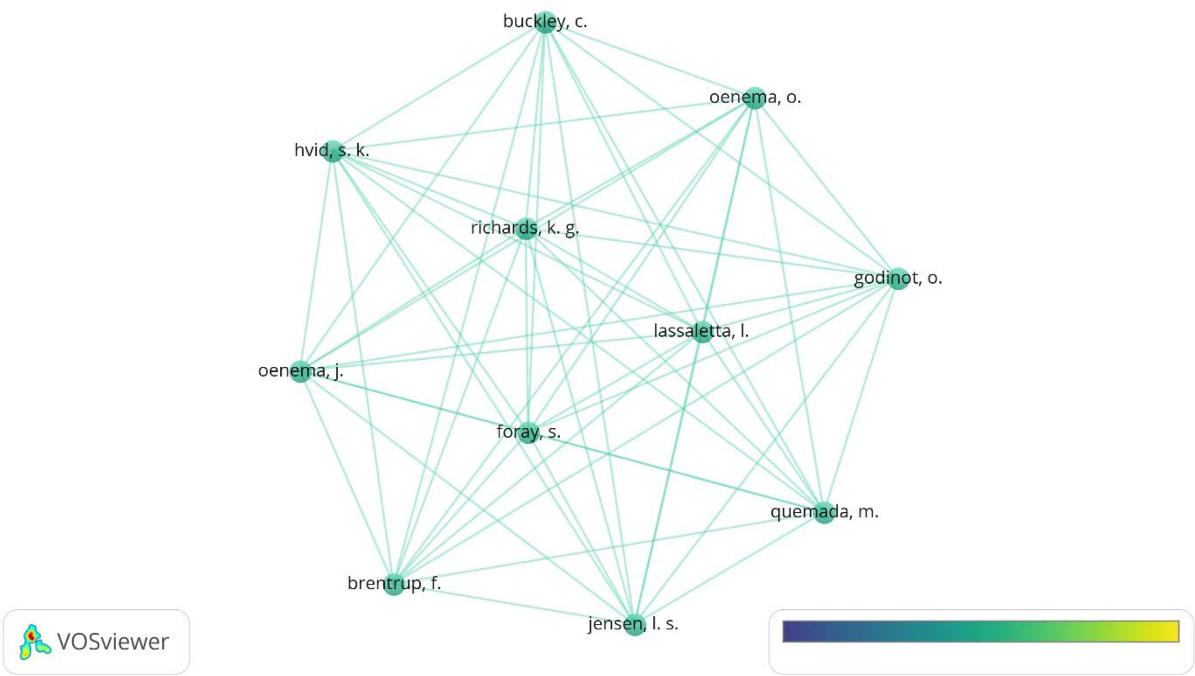



**Figure 2.** Collaboration Network of the Most Influential Authors in Green Accounting Literature

Table 3 shows the most cited authors in the field of environmental accounting. Mendelsohn and Muller have the highest number of citations. Block et al. are notable for their high linking power, while Fenichel has consistently contributed to the field with a large number of papers. Overall, the work of a small number of authors has had a major impact on the literature.

**Tablo 3.** Most Cited Authors in Green Accounting Publications

| Author | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Robert O. Mendelsohn | 1 | 272 | 1 |
| Nicholas Z. Muller | 1 | 272 | 1 |
| Christophe Block | 1 | 193 | 8 |
| Juan J. Cabello Eras | 1 | 193 | 8 |
| Carmen Chamorro | 1 | 193 | 8 |
| David Garcia-Lorenzo | 1 | 193 | 8 |
| Dries Haeseldonckx | 1 | 193 | 8 |
| Luc Hens | 1 | 193 | 8 |
| Karla Herrera Mendoza | 1 | 193 | 8 |
| Alexis Sagastume Gutierez | 1 | 193 | 8 |
| Carlo Vandecasteele. | 1 | 193 | 8 |

| Author | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Andrew May | 1 | 181 | 2 |
| Alistair McDonald | 1 | 181 | 2 |
| Gordon Mitchell | 1 | 181 | 2 |
| Eli P. Fenichel | 5 | 136 | 7 |
| Others (329) | 1,14 | 22,28 | 2,57 |

**Source:** WoS

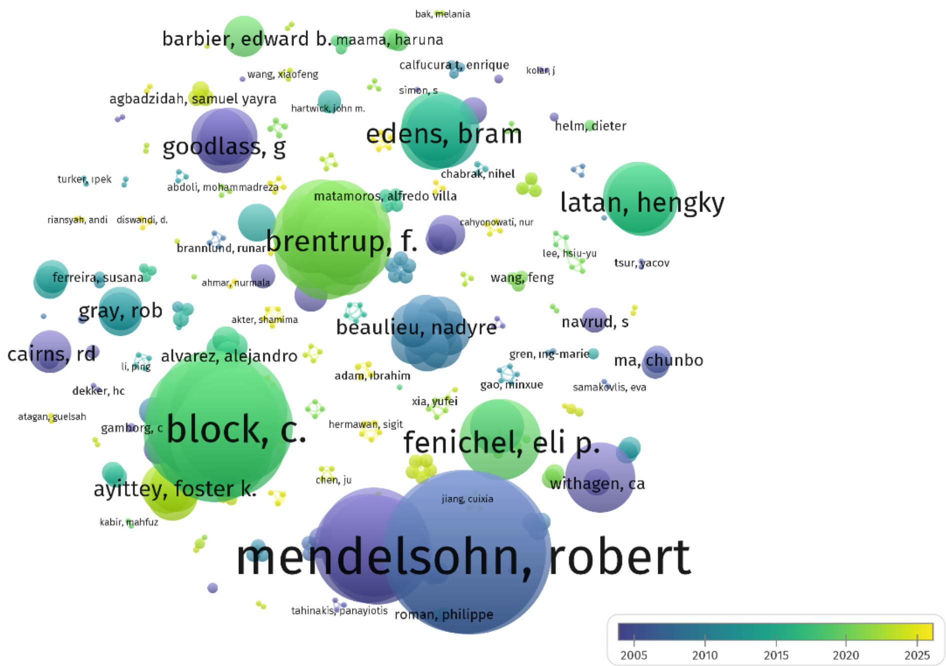



**Figure 3.** Collaboration Network of the Most Cited Authors in Green Accounting Publications

### 4.3.3. Keyword Analysis

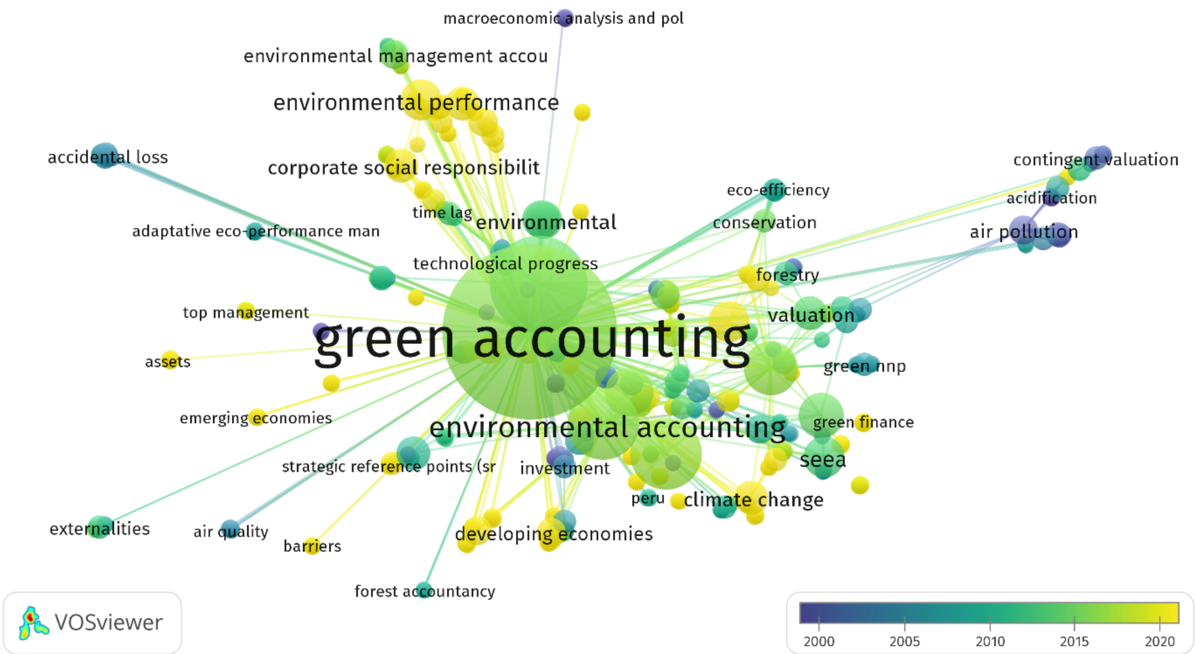
Table 4 shows the most frequently used keywords in the green accounting literature. “Green Accounting” is by far the most used keyword (94 times) and has the highest total link strength (400). This shows that green accounting is a central concept in studies. Terms such as “Sustainability” (31 times) and “Environmental Accounting” (17 times) were also used with significant frequency, indicating that the topic is addressed in the context of sustainability and environmental accounting. More specific terms such as “Ecosystem Services,” “Natural Capital,” and “Green GDP” also reflect the diversity in the field and the association of environmental impacts with economic dimensions. As a result, green accounting studies are shaped around the concepts of “green accounting” and “sustainability.”

**Table 4. Most Frequently Used Keywords in Green Accounting Literature**

| Keyword | Occurrences | Total Link Strength |
|---|---|---|
| Green Accounting | 94 | 400 |
| Sustainability | 31 | 132 |
| Environmental Accounting | 17 | 79 |
| Sustainable Development | 17 | 67 |
| Ecosystem Services | 10 | 49 |
| Genuine Savings | 8 | 35 |
| Green Gdp | 7 | 32 |

| Keyword | Occurrences | Total Link Strength |
|---|---|---|
| Environmental Performance | 6 | 21 |
| Natural Capital | 6 | 34 |
| Seea | 6 | 31 |
| Others (463 ) | 1,19 | 5,65 |

**Source:** WoS




### 4.3.4. Citation Analysis of Organizations

Table 5 shows the top contributing institutions in terms of publications in the field of environmental accounting. The institutions are listed according to the number of documents they have produced, the number of citations to these works and the total link strength. McGill University has the highest number of publications with 14 documents and 128 citations. This indicates a significant contribution in terms of quantity. Yale University seems to have had the highest impact, with only 3 publications and 289 citations. This indicates a small number of but impactful studies. Yale School of the Environment and Universidad Católica Luis Amigó are notable in terms of total link strength (24 and 23 respectively). The United States Environmental Protection Agency (EPA) has the highest link strength (27) with only 3 publications. This shows that the agency is a central source of information in the field of environmental accounting. Institutions such as Yale, McGill and EPA are particularly prominent in terms of both influence and network connectivity.

**Tablo 5. Top Institutions with the Most Publications and Citations in the Field of Green Accounting (WoS Data)**

| Organization | Documents | Citations | Total Link Strength |
|---|---|---|---|
| McGill University | 14 | 128 | 17 |
| Amity University | 4 | 10 | 22 |
| Yale University | 3 | 289 | 16 |
| Yale School of the Environment | 3 | 119 | 24 |
| Université du Québec | 3 | 108 | 3 |

| Organization | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Umeå University | 3 | 34 | 8 |
| United States Environmental Protection Agency | 3 | 27 | 27 |
| Queen's University | 3 | 20 | 3 |
| Universidad Católica Luis Amigó | 3 | 18 | 23 |
| Others(224) | 1,08 | 29,59 | 3,37 |

**Source:** WoS

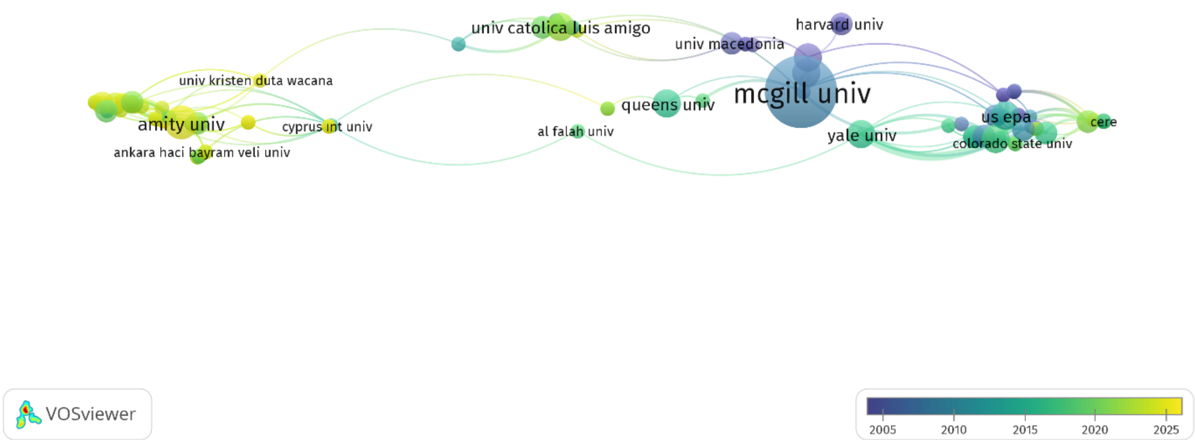



**Figure 4.** Featured Universities in Green Accounting Research

### 4.3.5. Citation Status Analysis of Countries

Table 6 shows the ranking of countries in the field of green accounting according to the number of publications, citations, and total linking power. The USA stands out as the country with the highest contribution and impact in the field with 26 publications and 843 citations. The UK has a significant impact with 14 publications and 582 citations. Canada and China also stand out with their high number of publications and citations. Developing countries such as Indonesia, India, Australia, and Bangladesh are also conducting active research in this field. Although Türkiye has 4 publications, the number of citations is extremely low (2), indicating that it has less influence in the field. Developed countries such as the USA and the UK are leading the green accounting research, and developing countries are also contributing, but their impact is still limited.

**Table 6.** Country Ranking in Green Accounting Studies Based on Number of Publication

| Country | Documents | Citations | Total Link Strength |
|---|---|---|---|
| United States of America | 26 | 843 | 48 |
| Canada | 18 | 236 | 19 |
| People's Republic of China | 16 | 207 | 30 |
| England | 14 | 582 | 28 |
| Republic of Indonesia | 13 | 139 | 29 |

| Country | Documents | Citations | Total Link Strength |
|---|---|---|---|
| Republic of India | 10 | 61 | 25 |
| Kingdom of Sweden | 7 | 103 | 19 |
| Commonwealth of Australia | 6 | 269 | 24 |
| People's Republic of Bangladesh | 6 | 106 | 22 |
| Kingdom of the Netherlands | 6 | 402 | 7 |
| Republic of Ireland | 5 | 173 | 20 |
| Federal Republic of Germany | 5 | 249 | 7 |
| Kingdom of Denmark | 5 | 267 | 0 |
| Republic of Colombia | 4 | 211 | 15 |
| Republic of Türkiye | 4 | 2 | 6 |
| French Republic | 4 | 211 | 3 |
| Italian Republic | 4 | 69 | 0 |
| Republic of Ghana | 3 | 87 | 27 |
| Malaysia | 3 | 87 | 18 |
| Others (29) | 1,51 | 34,51 | 3,55 |

**Source:**WoS

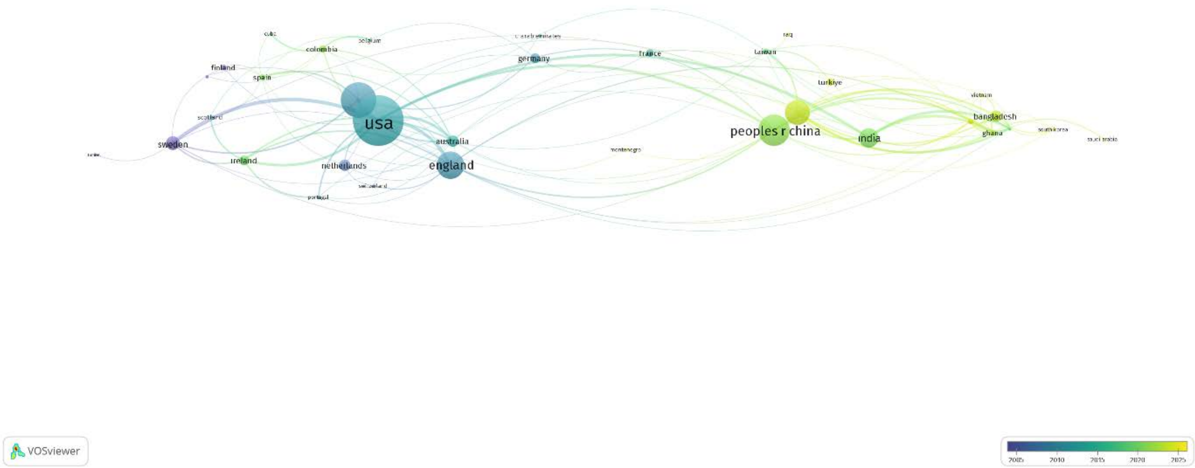



**Figure 5.** Co-authorship Network of Countries

### 4.3.6. Analysis of the Bibliographic Matching Status of Texts

Table 7 shows the important publications in the field of green accounting, the number of citations these publications have received and their total link strength. Muller (2007) is the most cited study with 272 citations, and the total link strength is 10. This shows that the study is both influential and has specific links in literature. Hens (2018) and Mitchell (1995) are important studies with 193 and 181 citations, respectively. Solovida (2017) is an important center in literature with high link strength (39) despite its low citation count (118). Obst (2016) and Fenichel (2014) are strongly related to other studies with high link strengths (130 and 154). Although Dhar (2022) is a more recent study, it has 85 citations and is moderately linked in the literature. The table shows that some key publications have both high impact and strong linkages in the green accounting literature, but there are also a large number of less influential studies in the field.

**Tablo 7. Bibliographic Coupling Network of Green Accounting Publications**

| Document | Citations | Total Link Strength |
|---|---|---|
| Muller (2007) | 272 | 10 |
| Hens (2018) | 193 | 3 |
| Mıtchell (1995) | 181 | 6 |
| Quemada (2020) | 131 | 1 |
| Solovida (2017) | 118 | 39 |
| Obst (2016) | 116 | 130 |
| Halberg (2005) | 96 | 0 |
| Fenichel (2014) | 90 | 154 |
| Dhar (2022) | 85 | 21 |
| Others (153) | 13,63 | 52,16 |

**Source:** WoS

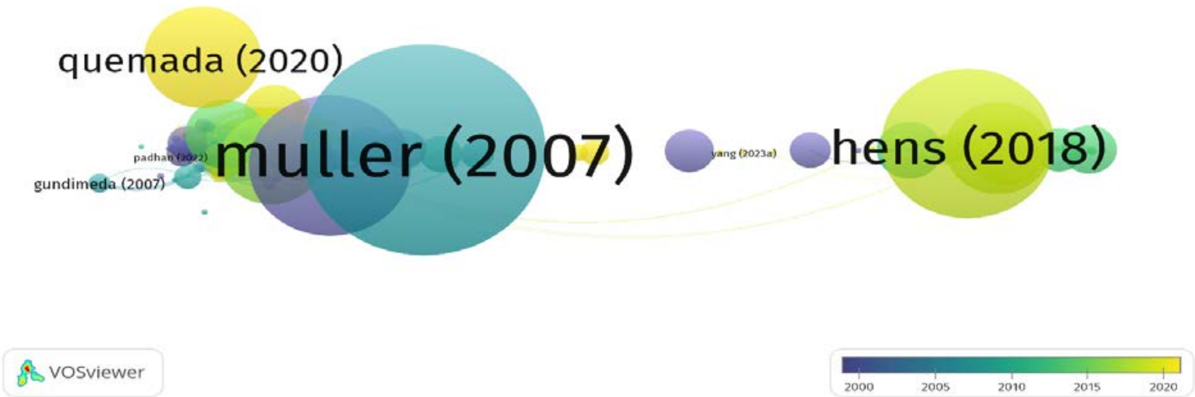



**Figure 6.** Bibliographic Coupling Network of Green Accounting Publications

## 5. CONCLUSION AND RECOMMENDATIONS

In this study, 162 articles (one article has been retracted) indexed in the Web of Science (WoS) database were examined. The primary aim of the research is to analyze high-quality publications in the field of green accounting and visually map this body of literature. The review of the literature revealed a limited number of bibliometric studies on this topic. For instance, Koçyiğit, Temelli, & Baskan (2023) analyzed 59 publications (1945–2022) from the WoS database, while Öztürk (2022) examined 146 publications from Turkish indexes up to the year 2022. In contrast, our study covers 162 publications from 1992 to 2025 by including sources indexed in the SCI-Expanded, SSCI, and ESCI categories of WoS. This broader and more up-to-date dataset provides a significant advantage, particularly due to the inclusion of the last three years (2022–2025), which helps reflect current trends in the field. Previous studies have typically focused on Turkey or on specific subfields such as health. However, this study adopts a global perspective, providing a comparative analysis of different countries, institutions, and authors, thus offering more universal insights. Therefore, it can be argued that our research presents a more comprehensive, up-to-date, globally focused, and thematically in-depth analysis compared to earlier studies.

This literature review highlights that green accounting is not merely a reporting tool but also a critical bridge for achieving sustainable development goals (SDGs 12 and 13). In other words, the establishment of a green financial accounting system is a key factor influencing the sustainability of relevant sectors. Green accounting goes beyond traditional financial accounting by attempting to integrate environmental impacts into economic values. However, a review of the literature indicates that universally accepted standards and methods in this field are still lacking.

Inconsistencies in practice, regulatory gaps, and the risk of greenwashing suggest a need for further research and policy improvements. To enhance the effectiveness of green accounting, the following steps are recommended:

- ✓ Strengthening Legal Regulations: Mandating the inclusion of environmental costs in financial reporting and enhancing transparency (Xue, Jiang, and Wei 2024).
- ✓ Technology Integration: Utilizing artificial intelligence and big data analytics to more accurately measure and report environmental data (Khan and Gupta 2024).
- ✓ Education and Awareness: Providing training for accountants and managers on green accounting practices (Deegan 2013).
- ✓ Incentive Mechanisms: Promoting green investments through tax reductions and sustainable financing models (Wiredu, Osei Agyemang, and Agbadzidah 2023).

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# DO ESG DISCLOSURES AFFECT FIRM PERFORMANCE IN EMERGING MARKETS? EVIDENCE FROM TÜRKİYE

**Ümran Bulut Su***

**ABSTRACT**

**This study examines the differences in financial performance between companies that disclose ESG (Environmental, Social, and Corporate Governance) data and those that do not, using a Turkish sample. Group comparison tests and log-transformed regression analyses were conducted with data from 12 companies. ROA, ROE, and Tobin's Q were used as financial performance indicators. The findings reveal that companies that disclose ESG significantly underperform, particularly in terms of Tobin's Q ($p<0.001$). The differences in ROA and ROE are marginal. The regression results indicate that ESG disclosures have a negative impact on all three performance indicators. This suggests that ESG practices may be costly in the short term and have not yet yielded financial returns for companies in the investment stage.**

**Keywords:** ESG Disclosure, Financial Performance, Emerging Markets, ESG Investment Impact, Sustainability

## ESG AÇIKLAMALARI GELİŞEN PİYASALARDA ŞİRKET PERFORMANSINI ETKİLİYOR MU? TÜRKİYE'DEN KANITLAR

**ÖZET**

**Bu çalışma, ESG (Çevresel, Sosyal ve Kurumsal Yönetişim) verisi açıklayan ve açıklamayan firmaların finansal performansları arasındaki farkları Türkiye örneğinde incelemektedir. 12 firmadan elde edilen verilerle grup karşılaştırma testleri ve log-dönüşümlü regresyon analizleri uygulanmıştır. Finansal performans göstergeleri olarak ROA, ROE ve Tobin Q kullanılmıştır. Bulgular, ESG açıklayan firmaların özellikle Tobin Q açısından anlamlı düzeyde daha düşük performans gösterdiğini ortaya koymaktadır ($p<0.001$). ROA ve ROE farkları ise marjinal düzeydedir. Regresyon sonuçları, ESG açıklamalarının üç performans göstergesi üzerinde de negatif etkide bulunduğunu göstermektedir. Bu durum, ESG uygulamalarının kısa vadede maliyet yaratabileceğini ve yatırım aşamasındaki firmalarda henüz finansal getiri sağlamadığını düşündürmektedir.**

**Anahtar Kelimeler:** ESG Açıklaması, Finansal Performans, Gelişmekte Olan Piyasalar, ESG Yatırım Etkisi, Sürdürülebilirlik

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# THE CAUSALITY RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENT AND GROWTH: EVIDENCE FROM MINT COUNTRIES

**Şerif Canbay[*], Elveda Özdilek Kırca[**]**

## ABSTRACT

**This study aims to reveal the direction and nature of the relationship between foreign direct investment (FDI) and economic growth in MINT countries (Mexico, Indonesia, Nigeria and Turkey). In the study, annual data for the period 1970-2023 were obtained from the World Bank database and these data were analyzed with the Bootstrap Panel Causality test developed by Konya (2006). According to the results of the analysis, there is a statistically significant and positive causality relationship from economic growth to FDI in Indonesia, Nigeria and Türkiye. This suggests that economic growth may function as a factor that increases the interest of foreign investors in these countries. In the analysis conducted for Mexico, no statistically significant relationship was found. This situation shows that FDI in Mexico may be affected by factors other than economic growth. On the other hand, a statistically significant and positive causal relationship from FDI to economic growth was found only in Nigeria. This result shows the potential of FDI to contribute to the economic growth process in the Nigerian case. The results of the study provide noteworthy implications for both policymakers and investors and emphasise that the impact of FDI on growth should be evaluated in line with country dynamics.**

**Keywords:** MINT countries, FDI, Economic Growth, Bootstrap Panel Causality test.

## DOĞRUDAN YABANCI YATIRIMLAR VE BÜYÜME ARASINDAKİ NEDENSELLİK İLİŞKİSİ: MINT ÜLKELERİNDEN BULGULAR

## ÖZET

**Bu çalışma, MINT ülkelerinde (Meksika, Endonezya, Nijerya ve Türkiye) doğrudan yabancı yatırımlar (FDI) ile ekonomik büyüme arasındaki ilişkinin yönünü ve niteliğini ortaya koymayı amaçlamaktadır. Çalışmada, 1970-2023 dönemine ait yıllık veriler Dünya Bankası veri tabanından temin edilmiş ve bu veriler, Konya'nın (2006) geliştirdiği Bootstrap Panel Nedensellik testi ile analiz edilmiştir. Analiz sonuçlarına göre, Endonezya, Nijerya ve Türkiye'de ekonomik büyümeden FDI'a doğru istatistiki olarak anlamlı ve pozitif yönlü bir nedensellik ilişkisi tespit edilmiştir. Bu durum, ilgili ülkelerde ekonomik büyümenin yabancı yatırımcıların ilgisini artıran bir unsur olarak işlev görebileceğini düşündürmektedir. Meksika için yapılan analizde ise istatistiksel olarak anlamlı bir ilişki bulunmamıştır. Bu durum, Meksika'da FDI'ın ekonomik büyümeden çok başka faktörlerden etkileniyor olabileceğini göstermektedir. Öte yandan, FDI'dan ekonomik büyümeye doğru istatistiksel olarak anlamlı ve pozitif bir nedensellik ilişkisine yalnızca Nijerya'da rastlanmıştır. Bu sonuç, Nijerya örneğinde doğrudan yabancı yatırımların ekonomik büyüme sürecine katkıda bulunma potansiyelini göstermektedir. Çalışmanın sonuçları hem politika yapıcılar hem de yatırımcılar açısından dikkate değer çıkarımlar sunmakta; özellikle FDI'ın büyüme üzerindeki etkisinin ülke dinamikleri doğrultusunda değerlendirilmesi gerektiğine vurgu yapmaktadır.**

**Anahtar Kelimeler**: MINT Ülkeleri, Doğrudan Yabancı Yatırımlar, Ekonomik Büyüme, Bootstrap Panel Nedensellik Testi

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# EVALUATING THE IMPACT OF ESG SCORES ON FINANCIAL PERFORMANCE: A COMPREHENSIVE BIBLIOMETRIC STUDY

**Azize Kahramani Koç* Musa Gün ****

## ABSTRACT

**Environmental, Social, and Governance (ESG) investments are increasingly recognized as pivotal drivers of sustainable long-term growth and concurrently influence corporate financial performance. This study aims to perform a comprehensive bibliometric analysis to delineate the prevailing and emerging research trajectories concerning ESG factors and their impact on financial performance. To achieve this objective, the study analyzes a dataset comprising 110 articles from the Web of Science database, spanning 2019 to 2025. Employing bibliometric techniques facilitated by R Studio software, the analysis encompasses various dimensions, including author productivity, citation frequencies, inter-institutional collaboration networks, publication counts by country, cross-national research partnerships, thematic mapping, and keyword co-occurrence visualizations. The observed year-on-year increase in publications underscores the escalating significance of ESG and financial performance research for both nations and enterprises. Notably, the findings reveal that Italy leads in publication volume, India excels in collaborative efforts, and Germany stands out in citation impact.**

**Keywords:** ESG Score, Financial Performance, Bibliometric Analysis

## ESG PUANLARININ FİNANSAL PERFORMANS ÜZERİNDEKİ ETKİSİNİN DEĞERLENDİRİLMESİ: KAPSAMLI BİR BİBLİYOMETRİK ÇALIŞMA

## ÖZET

**Çevresel, sosyal ve yönetişim (ESG) yatırımları, bir işletmenin uzun vadede sürdürülebilir büyümesine olanak sağlayan aynı zamanda finansal açıdan da işletmeleri etkileyen önemli bileşenler olarak kabul edilmektedir. Dalayısıyla bu çalışmada, ESG ve finansal performans konusunun mevcut ve gelecekteki araştırma yönlerini ortaya koyabilmek için bibliyometrik analizin yapılması amaçlanmıştır. Bu amaç doğrultusunda çalışma, 2019'dan 2025'e kadar Web of Sicence veri tabanından elde edilen 110 adet makalenin verilerini kapsamaktadır. R studio programı aracığıyla yapılan bibliyometrik analiz ile yazarlar, atıflar, kurumlar arası iş birliği ağı, ülkelere göre makale sayısı, ülkeler arası işbirliği ağı, tematik haritalama ve kelime bulutu olarak görselleştirilip ve tablolaştırılarak değerlendirme yapılmıştır. Yıldan yıla yayınlardaki artış ESG ve finansal performans çalışmalarının hem ülkeler hem de işletmeler için önemli olduğunu ortaya koyduğu söylenebilir. Elde edilen bulgulara göre en çok yayın yapan ülkenin İtalya, en fazla işbirliğinin olduğu ülkenin Hindistan, En yüksek atıf sayısına sahip ülkenin ise Almanya olduğu tespit edilmiştir.**

**Anahtar Kelimeler:** ESG Skor Değerleri, Finansal Performans, Bibliyometrik Anali

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## 1. INTRODUCTION

In today's business and organizational context, there are multifaceted and unpredictable environmental changes such as resource dwindling, regulatory modifications, climate emergencies, or increasing social disparities. These environmental metamorphoses, combined with increased stakeholder pressure, impose enormous challenges that demand the rethinking of the old business models. The more global concerns are interrelated and challenging, the more pressure has been put on companies to integrate an environmental dimension in their core strategies to be competitive, resilient, and keep pace in the long run (Xu et al., 2024: 53).

In the accelerating spread of industrialism, the world is encountering an ever-faster wave of environmental destruction, climate chaos, resource loss, and social disarray. These concerns lead to the fact that consideration of sustainable development needs to become much more central to the way we envision and design our contemporary economies (Zhang et al., 2023: 69). Sustainability has now transcended a buzzword; it has matured into a shared vision for political agendas, social programs, and economic plans. Connect below the surface, however, is a middle ground that depends on sustainability, fairness, and economic viability, to enable the creation of enduring for the future (Schaltegger and Hörisch 2017: 259).

In today's world, where complex challenges like climate change, inequality, and resource depletion are on the rise, choosing a sustainable path is no longer a luxury—it's a necessity. Sustainable development means meeting our needs today without taking away the chance for future generations to meet theirs. In recent years, countries around the world have started to recognize just how important this shift is. It's not just about protecting the environment; it's about creating fairer societies and stronger economies. This change invites us to rethink how we plan and act, ensuring that environmental, social, and economic values work together to build a more resilient and just future for all (Galletta et al., 2022: 1).

And like the world at large, the way we invest is changing, too, as we become more conscious of sustainability. There's a spreading recognition that financial choices should aspire not only to profit but also to protect the planet and promote fairness. Investments that are mindful of environmental issues — including climate change, finite resources, and social inequality — are continuing to gain traction. That is why it is so important to incorporate ESG values (Environmental, Social, and Governance) to be able to develop an economy that can survive in the long term (Pathan and Mohanty, 2024: 197).

The idea of "Environmental, Social, and Governance" (ESG) investing didn't appear overnight—it grew out of a broader movement known as Socially Responsible Investing (SRI), which first took off in the 1960s and 1970s. Back then, rapid industrial growth in Europe and North America was causing serious pollution and social issues, sparking public calls for change. People began pushing for investments that didn't just aim for profit but also considered ethics, justice, and the environment.

As these values began to gain traction, the world of finance started to catch on — investors more and more wanted to ensure that their money was backing companies that were acting responsibly. The concept of "Environmental, Social, and Governance" was first defined in a 2004 United Nations report called Who Cares Wins, which argued that ESG thinking should be integrated into mainstream investment. Cashing in on this momentum, the UN introduced the "Principles for Responsible Investment" in 2006 to guide institutions globally for investment decision making that is not only profitable but sustainable and ethical (Khurshid and Islam, 2024: 1).

Around the world, various organizations have stepped in to help companies be more transparent about their environmental, social, and governance efforts. Groups like the "Global Reporting Initiative", "Carbon Disclosure Project", "UN Global Compact", the "Sustainability Accounting Standards Board", and the "International Integrated Reporting Council" offer tools and guidelines for doing just that. These systems help businesses explain to their stakeholders how they're dealing with important non-financial issues, like climate impact, social responsibility, and ethical governance. By using these frameworks, companies can better understand and communicate how their actions affect people, the planet, and long-term trust in their operations. Such an organised system not only brings more transparency and accountability, but it also ensures that the corporate strategies are homed in on sustainable development targets, ensuring the long-term value creation of various stakeholders (Ellili, 2022: 1).

ESG criteria represent a contemporary framework for sustainable governance, integrating economic, environmental, and social considerations into organizational strategies. These criteria have become pivotal indicators of management effectiveness, risk mitigation, and non-financial performance. Furthermore, unlike Corporate Social Performance (CSP) or Corporate Social Responsibility (CSR) (Martiny et al., 2024: 1), ESG covers broad topics regarding the environment (e.g. energy, climate change, carbon emissions, and water use), social responsibility (e.g.human rights, fair trade principles, product safety, health, and gender equality) and corporate governance (e.g., corruption, board independence, shareholder protection, bribery, disclosure, and reporting ) (Galbreath, 2013: 530).

The ESG score serves as a quantitative metric that evaluates a company's performance across key sustainability dimensions—environmental stewardship, social responsibility, and governance practices. The ESG score comprises three primary subcomponents: Environmental, Social, and Governance factors. Each of these dimensions is assessed independently—Environmental Pillar Score, Social Pillar Score, and Governance Pillar Score - based on a range of industry-specific indicators. These individual pillar scores are then combined to obtain the overall ESG score, a measure of a company's dedication to sustainable activities in these three important fields (Çetenak et al., 2022: 75).

In the last 20 years, there's been a major rise in SRI. Increasingly, people and organizations want their money to reflect their values — whether it's investing in the environment, promoting equality, or encouraging ethical leadership. ESG issues have increasingly become a core part of how companies are assessed, giving investors the tools to gauge how well a business is run and how well prepared it is to face the future. The train of such thinking has arrived, and company, fund managers, and shareholders have begun to thread ESG principles through the fabric of investment decision making and long-term strategies (Chen et al., 2021: 75).

ESG practices are an important way in which companies can help support global goals such as the UN's Sustainable Development Goals. They are structures that can assist organizations in relating their business activities with more comprehensive (sustainability) strategies (Lei and Yu 2023: 1177). When companies are transparent about their ESG performance and report scores, it makes the financial reporting more credible. This level of transparency builds trust among stakeholders and frequently results in greater financial backing. Ultimately, this can even benefit the company overall in financial and impact terms (Lee and Rashcke, 2023: 1).

As reported by Senadheera et al. (2022), ESG investing isn't only about doing good — it also allows companies to help dictate the terms of their sustainability plans and policies in ways that can ultimately benefit their financial health. Similarly, Khan (2022) pointed out that companies that engage in ESG activities make higher resistibility and have greater flexibility in the market. Empirical evidence provided by Raghunandan and Rajgopal (2022) suggested that embracing ESG indicators compels companies to engage in social obligations, to preserve the environment, and to strengthen accounting policies. Agustis et al. (2023) contended that ESG mechanisms are critical approaches to making a business sustainable and ensuring that it grows sustainably in the long run. Additionally, they claimed that companies with strong ESG performance can achieve a competitive edge over companies with weaker ESG credentials, and therefore offer more attractive investment opportunities.

Wan et al. (2023) noted that ESG ratings considerably influence value investment strategies and corporate governance of firms. Lee and Raschke (2023) found the ESG score to have a direct, first-order, and positive impact on the firm's financial performance, calculated as a return on sales adjusted for firm size and industry divergence. They also noted that companies with poor ESG ratings are more likely to greenwash than good scorers. Xu et al. (2024) clarified that companies that perform strongly on ESG show a better ability to manage risks and earn financial benefits, resulting in higher valuation standards.

With an increasing interest in ESG research in the last few years, bibliometric analysis has served, in particular, as the sine qua non to grasp the field of ESG studies in full (Senadheera et al., 2022: 1). Bibliometric techniques analyze in a structured way different characteristics of scientific literature such as keywords, references, publication trends, and authors, institutions, and country productivity. These analyses allow a field to be mapped and to provide a picture of its current status of being, to give insights into possible developments and new possibilities for future investigation (Lu et al., 2019: 1). Hence, good-quality bibliometric studies are a sturdy springboard for promoting academic argumentation and for informing future avenues of research. These kinds of studies help (1) researchers to get a comprehensive view of the field; (2) to pinpoint knowledge gaps; (3) to generate novel ideas for research, and (4) to articulate research contributions and place them in the field (Donthu et al., 2021: 285).

In light of these goals, the purpose of this study is to use bibliometric procedures to analyze academic papers on ESG scores and financial performance to participate in discussions in the field. Based on data analysis of widely used terms, volume, authors' collaboration, number of citations, annual publication, and other relevant statistical behaviors, this study presents a wide and deep look at the development of this field. Such findings provide information to the researchers on the existing holes of previous related studies and the new paths for further study. This paper is therefore a useful reference for academics wishing to participate in the discussion about ESG scores and their effect on firm market performance.

## 2. METHODOLOGY

### Purpose and Methodology of the Study

This paper intends to uncover the evolution and trend of scholarly works, including articles, conference papers, and reviews, indexed by the Web of Science (WOS) database and published in the period 2019-2025 on the research topic "ESG Scores and Financial Performance". The method is the Bibliometric Analysis through using the R Studio software environment. Bibliometric analysis is a methodology for systematically examining and appraising the body of scientific literature. This approach reveals the evolutionary trends of a given research area and contributes to the early recognition of horizons for future investigations. Notably, the bibliometric mapping technique allows for to visualization of intellectual structure and research field dynamics in science by combining both performance analysis and science mapping techniques (Donthu et al., 2021: 285-286).

The database of the WOS contributed data for the study exploring the diversity of the following bibliometric indicators: authorship, institutional affiliation, citation count, keywords, and the contributing country of ESG scores and financial performance. The downloaded studies (original articles, conference papers and review articles) are classified based on a subject category such as business-finance, management, economics, and their citation indices. A range of bibliometric techniques is utilized, including citation analysis, co-citation analysis, word cloud visualization, historical direct citation networks, cross-country collaboration networks, and bibliographic coupling, to map the entire research landscape.

**Table 8.** Search Framework for the Document

| **Parameters** | **Selection** |
|---|---|
| Selection approach | Bibliometric analysis |
| Database | WoS |
| Tools used for analysis | R Studio |
| Search query | ESG Scores and Financial Performance |
| Type of document | Article/Proceedings/Review Article |
| Period | 2019-2025 |
| Language | English |
| Total number of documents for analysis | 110 |
| Publication phase | Last |

Table 1 outlines the overall framework used during the document search process. From 2019 to 2025, we identified and analyzed 110 published documents, which formed the basis for our evaluation.

## 3. FINDINGS

In this section, we share the key findings from our analysis..

**Table 9.** Evaluation of Document Criteria

| **Criteria** | **Numbers** |
|---|---|
| **Document Types** | |
| Article | 103 |
| Proceedings | 5 |
| Review Article | 2 |
| **WoS Categories** | |
| Business-Finance | 59 |
| Management | 26 |
| Economics | 25 |
| **WoS Index** | |
| SSCI: Social Sciences Citation Index | 58 |
| ESCI: Emerging Sources Citation Index | 47 |
| SCI-Expanded: Expanded Science Citation Index | 3 |
| CPCI-SSH: Conference Proceedings Citation Index-Social Sciences and Humanities | 2 |
| **Total** | 110 |

Table 2 shows the number of documents according to specific criteria. When looking at the types of documents, articles make up the majority, with 103 contributions. In terms of subject areas within the Web of Science categories, there are 59 documents in Business-Finance, 26 in Management, and 25 in Economics. Looking at the indexing services, the SSCI has the highest number with 58 documents, followed by the ESCI with 47, the SCI-Expanded with 3, and the CPCI-SSH with 2. This data highlights how academic work on ESG scores and financial performance is distributed across different document types, research fields, and indices.

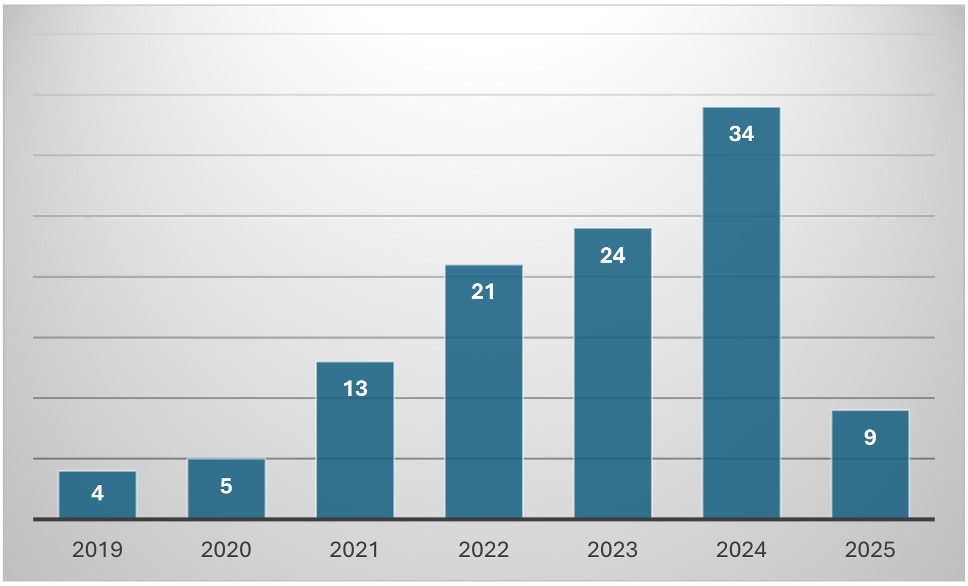


**Figure 1.** Number of Articles by Years

Figure 1 illustrates the number of academic publications from 2019 to 2025. An upward trend in publication volume is evident between 2019 and 2024, with the peak number of 34 publications occurring in 2024. Given that the publication data for 2025 were collected in May, there were 9 publications within the first five months of the year. As shown in Figure 1, this increasing trend reflects the growing academic interest in the role of sustainability in firms' financial performance, highlighting the subject's rising significance in scholarly research.

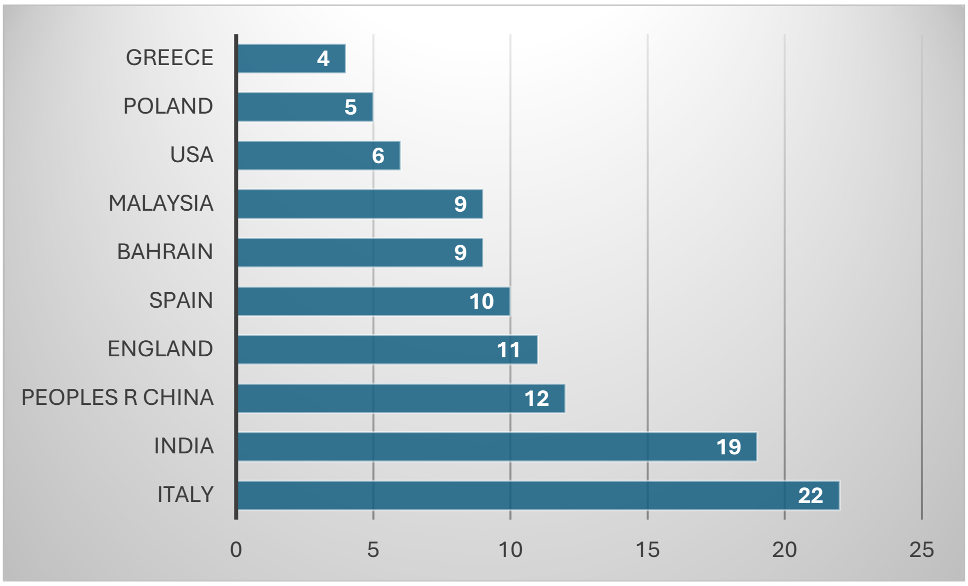


**Figure 2.** Number of Articles by Country (Top 10)

Figure 2 illustrates the number of articles published by the top 10 countries. Italy tops the list with 22 publications, closely followed by India with 19. On the other hand, Greece has the lowest number among these countries, with just 4 publications on the topic of “ESG scores and financial performance.”

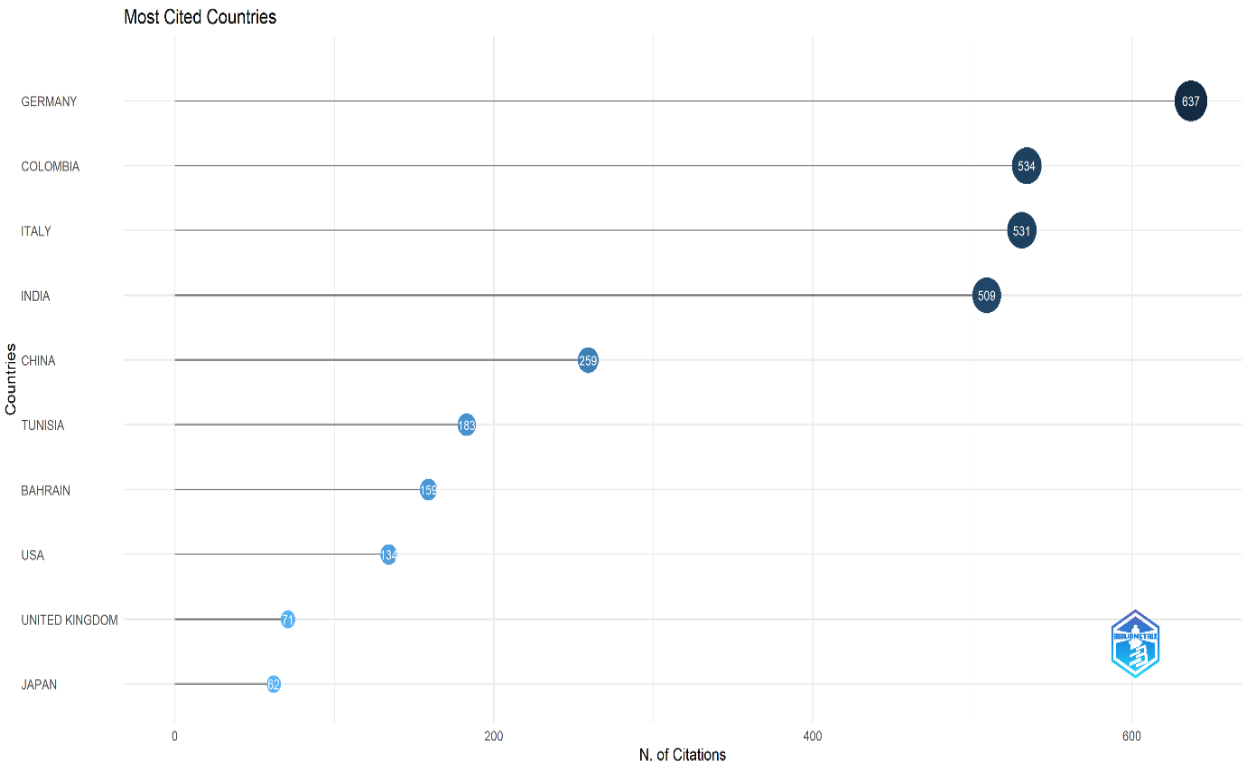


**Figure 3.** Most Cited Countries (Top 10)

Figure 3 shows how many times articles from each country have been cited. Germany tops the list with 637 citations, followed by Colombia with 537, Italy with 531, and India with 509. Meanwhile, the United Kingdom and Japan have fewer citations in comparison. This chart helps us understand the differences in research influence and activity among these countries.

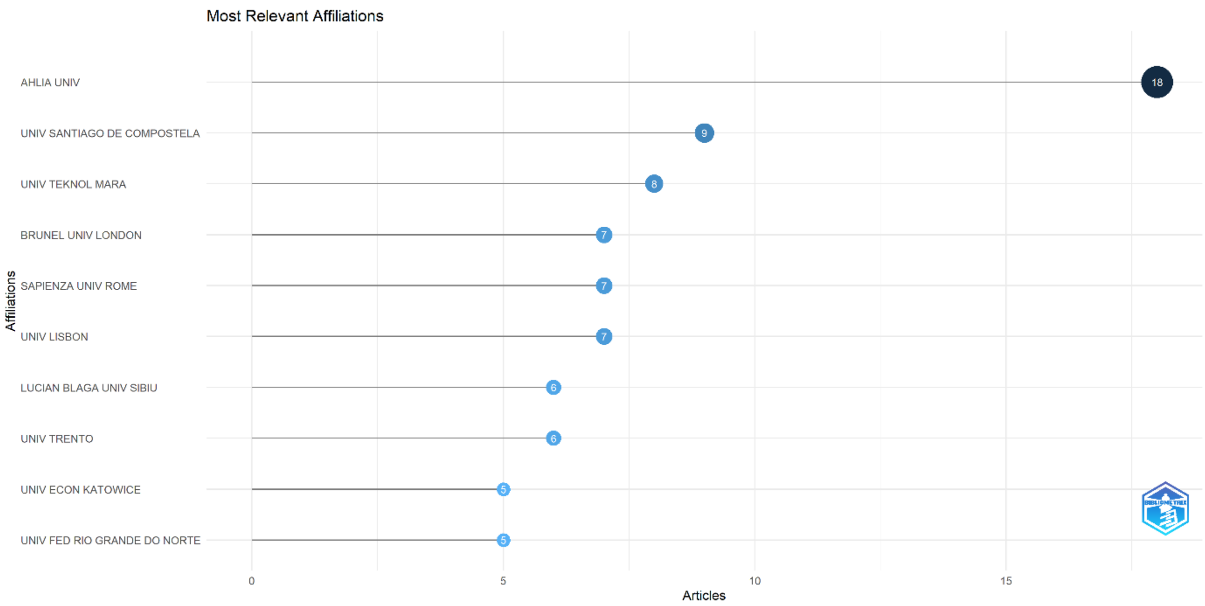


**Figure 4.** Most Relevant Affiliated Organizations (Top 10)

Figure 4 highlights the top 10 universities with co-author connections. It's clear that many of these collaborative studies are centered at Ahlia University.

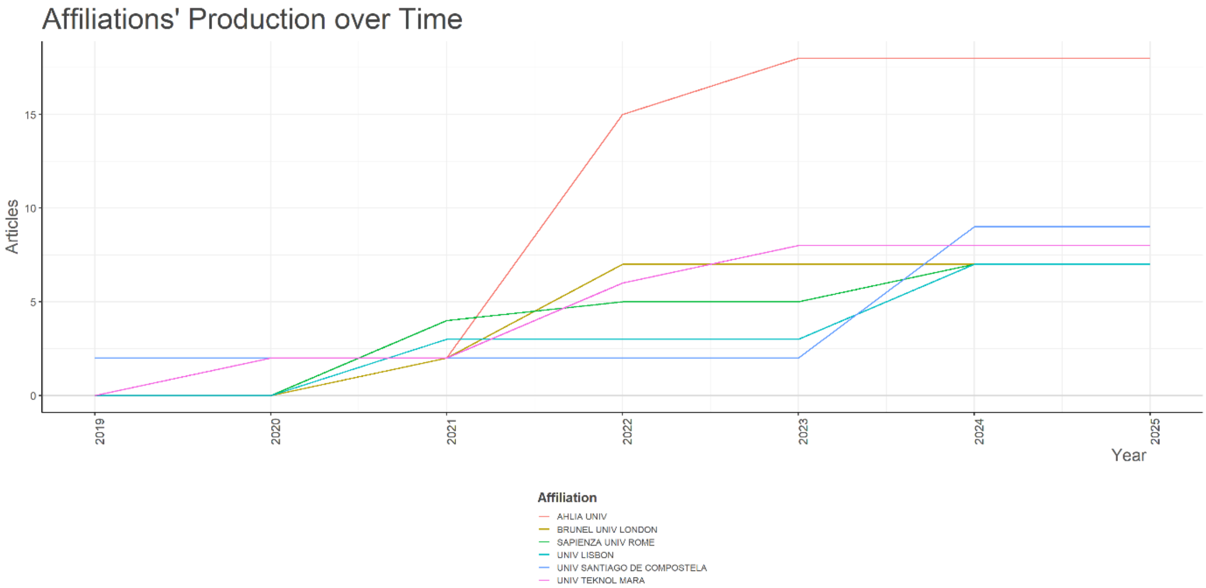


**Figure 1.** Article Production of Most Relevant Affiliated Organizations over Time (Top 6)

Figure 6 shows how the number of publications from universities focused on ESG score values and financial performance has changed over time. Between 2019 and 2025, there's a clear upward trend, especially at Ahlia University, where the number of publications has grown significantly since 2021.

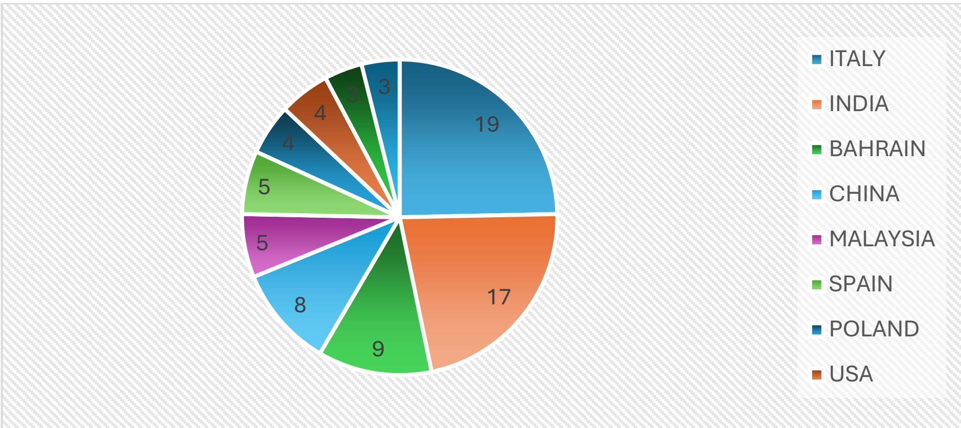


**Figure 7.** Countries of Related Authors (Top 10)

Figure 7 visualizes the geographic distribution of authors, with Italy leading at 19 authors, and India close behind with 17.

**Table 10.** Most Relevant Authors

| No. | Author | Publication Count |
|---|---|---|
| 1 | BUALLAY A | 8 |
| 2 | D'AMATO V | 3 |
| 3 | D'ECCLESIA R | 3 |
| 4 | LEVANTESI S | 3 |
| 5 | MENICUCCI E | 3 |
| 6 | PAOLUCCI G | 3 |
| 7 | AKBAR M | 2 |
| 8 | CANDIO P | 2 |
| 9 | DA SILVA DL | 2 |
| 10 | DE | 2 |

Looking at the data in Table 3, BUALLAY A stands out as the top author, having published 8 papers on the topic.

**Table 11.** Most Cited Authors

| No. | Author | Number of Citations |
|---|---|---|
| 1 | AGUILERA-CARACUEL J | 28 |
| 2 | DUQUE-GRISALES E | 28 |
| 3 | DREMPETIC S | 12 |
| 4 | KLEIN C | 12 |
| 5 | ZWERGEL B | 12 |
| 6 | BEHL A | 7 |
| 7 | DIPASHA D | 7 |
| 8 | KUMARI PSR | 7 |
| 9 | MAKHIJA H | 7 |
| 10 | SHARMA | 7 |

Table 4 presents the most cited authors. AGUILERA-CARACUEL J and DUQUE-GRISALES E lead the list with 28 citations each, while DREMPETIC S, KLEIN C, and ZWERGEL B come next with 12 citations each.


**Figure 8.** The Most Frequently Used Words

Figure 8 illustrates a word cloud that highlights the main themes in the literature about ESG scores and financial performance. The biggest words, like “financial performance” and “impact,” represent the main focus points. Other commonly mentioned terms include “governance,” “performance,” “management,” “sustainability,” “social responsibility,” and “disclosure.” Words like “risk,” "profitability," and "ownership" point to some of the more detailed research topics. Overall, this word cloud gives a clear picture of where most academic attention is concentrated on this subject.

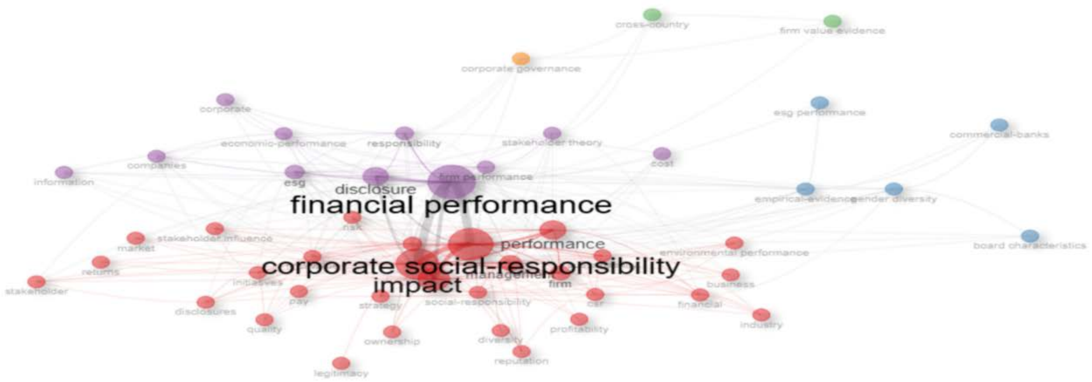


**Figure 9.** Concurrency Network

Figure 9 shows how the main ideas in the academic studies are connected, displayed as a network. The biggest circles belong to "corporate social responsibility" and "financial performance," which sit at the center and link strongly to many other concepts. The size of each circle indicates how important that idea is. Different colors group related themes together. This visual helps us understand not only the overall structure of knowledge but also how different topics are related to one another.

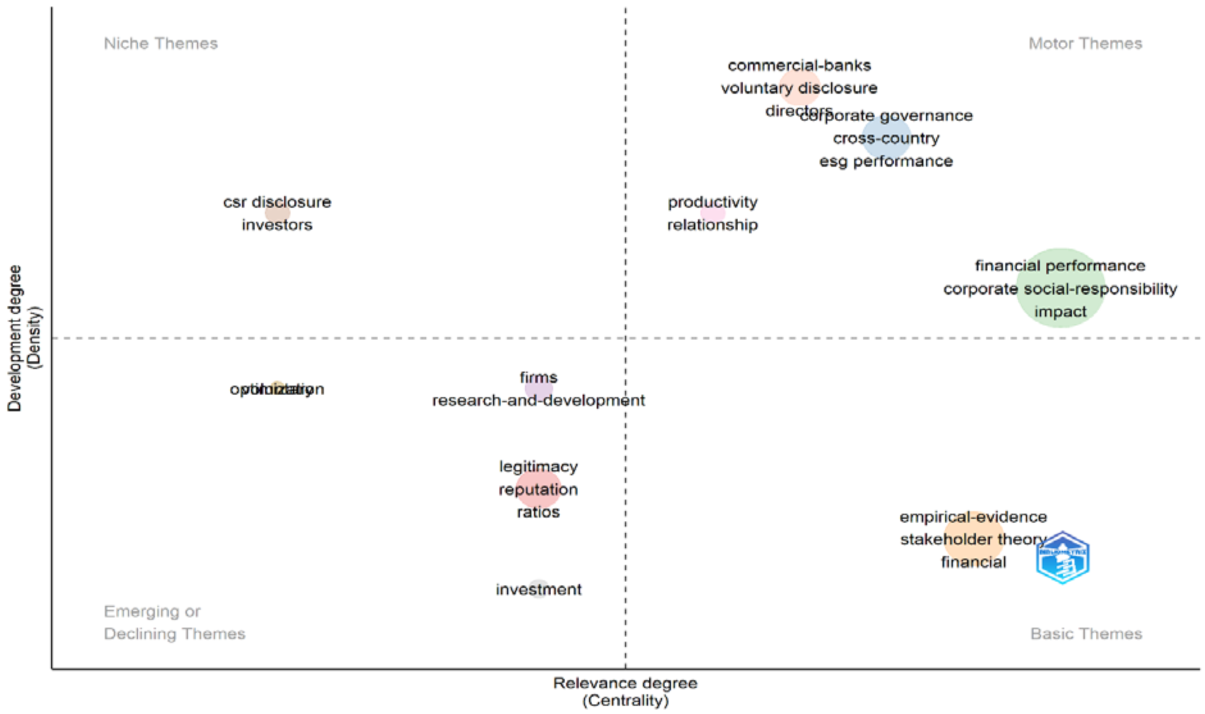

**Figure 10.** Thematic Map

Figure 10 presents a thematic map generated with R Studio, which helps us see how different topics relate to each other. The Y-axis tells us how developed each topic is, while the X-axis shows how central or important it is to the overall field. The upper right corner contains the most-researched topics, such as "financial performance," "corporate social responsibility," "impact," and "ESG performance." In the upper left corner, there are more specific approaches, such as "CSR disclosure" and "investors." In the bottom left are ones that have less new research to make them more popular, or that are experiencing less overall interest, such as "investment," "reputation," or "research and development." Finally, in the lower right corner, some areas haven't been as deeply explored, such as "empirical evidence," "stakeholder theory," and "financial." This map provides a strong visualization of what research has homed in on and what it has left room to continue.

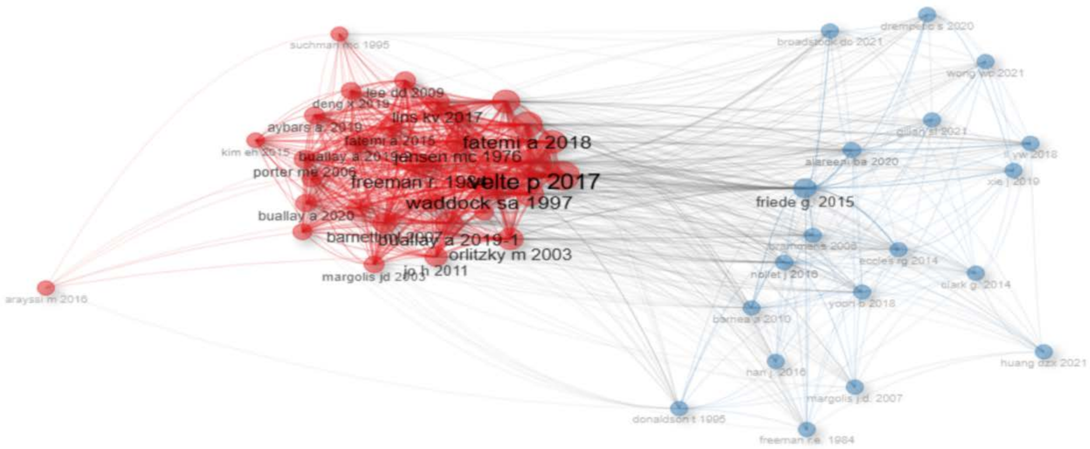


**Figure 11.** Authors' Common Citation Network

Figure 11 visualizes the co-citation network among authors. Looking at Figure 12, you can see that authors in the red cluster are closely connected with strong relationships, while those in the blue cluster are more spread out and have weaker connections.

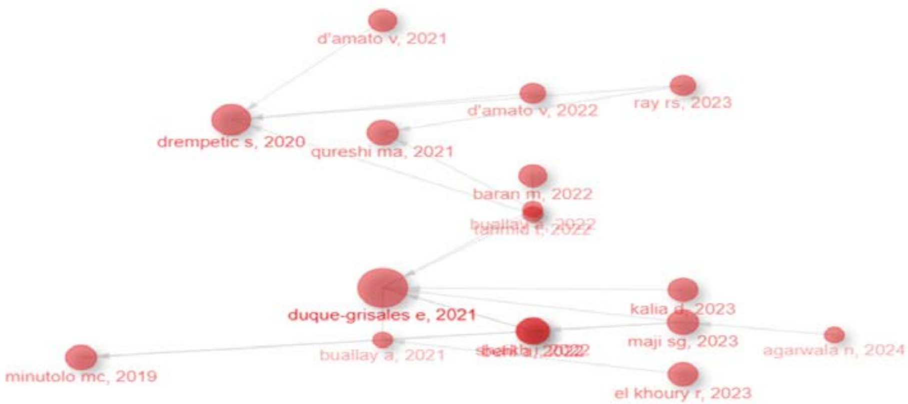


**Figure 22.** Historical Network of Connections

Figure 12 includes publications on ESG scores and financial performance between 2019 and 2025. The lines illustrate how authors are connected, and the size of each circle represents how central an author is in the network. Duque-Grisales E. (2021) stands out as the biggest and most connected author in this group.

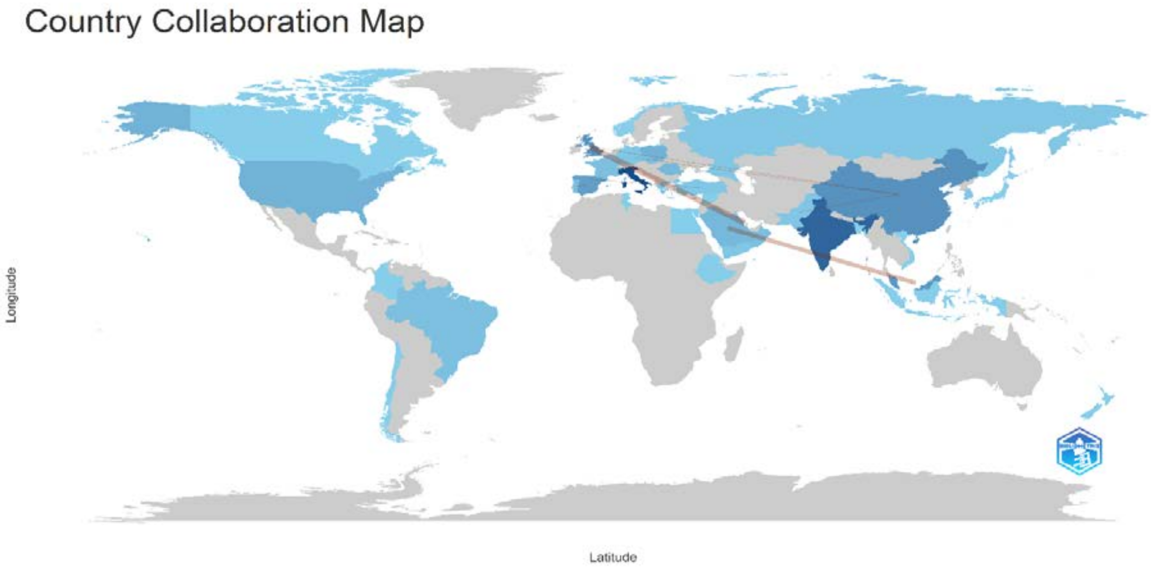


**Figure 33.** Collaboration Network of Countries

Figure 13 shows academic collaborations between countries, with lines representing their connections. The countries colored in dark blue—India, China, and the UK—stand out as having the closest and most active collaborations.

## 4. CONCLUSION

As industrialization and technology have rapidly advanced, the depletion of natural resources has become a pressing concern. This has made the burden of leaving an inhabitable world for future generations much more evident, and as such, sustainability is now a priority. Sustainability widens the scope in environmental, social, and economic dimensions. Implementing sustainability in strategies is essential for long-term survival, competitive advantage, and profitability of businesses. As the change gains momentum, more and more companies are reporting on their sustainability alongside their financial performance.

The term ESG (it stands for Environmental, Social, and Governance) was codified in 2006 as a way of defining a newly fashionable framework for sustainable business. Three primary factors are considered in ESG: environmental impact, social responsibility, and corporate governance. Each category gets its score, and those scores combine to determine the company's ESG score. Since then, it has grown into a reliable, transparent way to gauge how companies are managing as it relates to sustainability. There has recently been increasing interest in research both domestically and internationally, on the impact of ESG scores from the perspective of company financial performance.

Against this backdrop, this study investigates how the ESG scores and the financial performance have been researched in the academic field, employing bibliometric analysis with the software R Studio. The results show that most studies are published as articles, with the Social Sciences Citation Index (SSCI) providing the largest contribution of 58 documents. There has been a noticeable rise in the number of publications since 2019, highlighting the growing interest in this topic. Looking at countries, India leads in the number of publications, while Germany has the highest citation count with 637. Among authors, BUALLAY A. stands out as the most productive, with eight papers. The word cloud reveals that “financial performance,” “impact,” “governance,” “performance,” “management,” and “sustainability” are the main themes researchers focus on. Additionally, India, China, and the UK show the strongest collaborative efforts. Overall, this study seeks to provide a clear academic framework and enrich the literature by outlining current research trends on the link between ESG scores and financial performance.

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# DOES INTEGRATED REPORTING AFFECT FINANCIAL PERFORMANCE? AN INVESTIGATION ON THE TURKISH BANKING INDUSTRY

**Ersin Yenisu***

**ABSTRACT**

**Integrated reporting, which is a combination of financial and non-financial reporting approaches, is becoming increasingly important in terms of scope and impact. The aim of this study is to analyze whether there is any change in the financial performance of banks traded on Borsa Istanbul before and after the integrated report. In this context, the financial data of ten banks traded on Borsa Istanbul were analyzed in the study. In the application part of the study, the Mann-Whitney U Test, which is a non-parametric analysis method used to examine whether there is a significant difference between the means of the distributions, was used. The data used in the analysis covers the years 2016-2024 and was obtained from the Bloomberg database. According to the analyzes, it was seen that there was no general trend, in other words, integrated reporting did not have a consistent effect on financial performance. Then, groupings were made by showing state-owned banks in a separate group and private banks in a separate group, and collective analyzes were applied. According to the final findings, there is a significant difference in the financial indicators of private banks before and after integrated reporting. On the other hand, solid evidence could not be reached regarding the existence of the effect in state-owned banks. In conclusion, according to the findings of this study, publishing integrated reports generally has a positive effect on the profitability of banks.**

**Keywords:** Integrated Reporting, Financial Performance, Banking Sector

## ENTEGRE RAPORLAMA FİNANSAL PERFORMANSI ETKİLİYOR MU? TÜRK BANKACILIK SEKTÖRÜ ÜZERİNE BİR İNCELEME

**ÖZET**

**Finansal ve finansal olmayan raporlama anlayışının birleşiminden oluşan entegre raporlama kapsam ve etki açısından giderek önem kazanmaktadır. Bu çalışmanın amacı Borsa İstanbul'da işlem gören bankaların entegre rapor öncesi ve sonrasında finansal performanslarında herhangi bir değişimin olup olmadığını analiz etmektir. Bu doğrultuda çalışmada Borsa İstanbul'da işlem gören on bankanın finansal verileri analiz edilmiştir. Çalışmanın uygulama kısmında dağılımların ortalamaları arasında anlamlı bir farklılığın olup olmadığını incelemeye yarayan parametrik olmayan analiz yöntemlerinden Mann-Whitney U Testi kullanılmıştır. Analizde kullanılan veriler 2016-2024 yıllarını kapsamaktadır ve Bloomberg veri tabanından temin edilmiştir. Yapılan analizlere göre genel bir eğilimin olmadığı diğer bir ifadeyle entegre raporlamanın finansal performans üzerinde tutarlı bir etkisinin olmadığı görülmüştür. Daha sonra kamu sermayeli bankalar ayrı ve özel bankalar ayrı bir grupta gösterilerek gruplamalar yapılmış ve toplu analizler uygulanmıştır. Elde edilen nihai bulgulara göre özel bankaların finansal göstergelerinde entegre raporlama öncesi ve sonrasında anlamlı bir farklılık bulunmaktadır. Diğer yandan kamu sermayeli bankalarda ise söz konusu etkinin varlığına dair sağlam kanıtlara ulaşılamamıştır. Sonuç olarak, bu çalışmada ulaşılan bulgulara göre genel anlamda entegre rapor yayınlama bankaların karlılığını pozitif etkilemektedir.**

**Anahtar Kelimeler:** Entegre Raporlama, Finansal Performans, Bankacılık Sektörü

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## 1. INTRODUCTION

Integrated reporting is the most advanced stage of corporate reporting. Integrated reporting is a contemporary reporting approach that encompasses both traditional financial reporting and non-financial reporting based on the sustainability approach. After the International Integrated Reporting Council was established in 2013, an integrated reporting framework was developed and the number of corporate companies publishing integrated reports has increased rapidly all over the world. In Turkey, there has also been a significant increase in the number of companies publishing integrated reports, especially in recent years. Therefore, in recent years, it has become important to measure the impact of integrated reporting on the performance of companies both in the world and in Turkey. Indeed, it is necessary to evaluate the positive and negative aspects of integrated reporting for companies. In this context, many studies have been conducted in the literature. In Turkey, as the number of published integrated reports has increased, the impact of the said reporting on performance has begun to be examined. On the other hand, when the performances of companies are considered in recent years, the first thing that stands out is financial performance. In this context, the aim of this study is to find an answer to the question of whether there is any difference in the financial performance of banks publishing integrated reports in Turkey before and after integrated reporting.

In order to limit the subject in our study, banks operating in Turkey and publishing integrated reports in the last few years were included in the analysis. However, the fact that the data cannot be accessed very long ago is one of the most important limitations of this study. However, this study uses annual data sets between 2016-2024. In this respect, our study is one of the most up-to-date analyses and thus aims to contribute to the relevant literature. Among the studies that we could access in the literature, Baboukardos and Rimmel (2016) examined accounting indicators and value relationships in their studies. With the study in question, the authors found that there was a sharp increase in the earnings value coefficients in companies publishing integrated reports, but there was a decrease in the net asset coefficient values. Yüksel (2018) examined the relationship between integrated reporting and financial performance in his study and found that there was no relationship between integrated reporting scores and profitability ratios and financial structure ratios. Later, Yüksel and Kayalı (2020) examined the issue of integrated reporting and financial performance in their studies and as a result, they found that there was a significant relationship between integrated reporting and financial performance. Similarly, Emir et al. (2021) In their study, they revealed that asset quality, asset profitability and liquidity ratios were positively affected in companies that published integrated reports.

In our study, the Mann-Whitney U Test, one of the non-parametic tests, was used to examine the relationship between integrated reporting and financial performance. In the analyses, it was first examined whether there was a significant difference before and after the integrated report in terms of financial indicators for each bank, and then groupings were made and the analyses were finalized. According to the findings, there was a statistically significant increase in the financial performance indicators of private banks after integrated reporting. However, when the banks included in the analysis were considered individually, this relationship was statistically insignificant. On the other hand, publishing integrated reports in state-owned banks did not affect financial success. In addition, when evaluated individually, a relative increase in leverage ratios, i.e. debt utilization ratios, was observed in banks that published integrated reports.

In the following section of this study, information was tried to be given about the methodology used in the study. The findings were summarized in the next section. Finally, in the next section of the study, the conclusion section, a final assessment was made based on the literature review and the analysis findings.

## 2. METHODOLOGY

Quantitative analysis methods used in social sciences are generally based on the averages of distributions. Therefore, almost all quantitative analysis tools used in social sciences are based on estimation and provide approximate results. Therefore, it is inevitable to use more than one method and evaluate previous research findings for the reliability or validity of the analysis results. Empirical studies in the field in question usually start with descriptive statistical analysis, continue by relying on confidence intervals such as correlation or regression, and finally make inferences with a general evaluation. In this direction, the findings obtained as a result are used to support decision makers, make policy recommendations, or identify research gaps.

In this study, the Mann-Whitney U Test, one of the non-parametric methods, was used because it requires fewer assumptions and restrictions. This method has been used many times in the literature. The method in question tests whether there is a statistically significant difference between the means of the two distributions considered within the framework of confidence intervals. Whether there is a significant difference between the groups allows the existence or absence of the effect of the control variable considered.

In this study, the financial performance measures for public and private banks traded on Borsa Istanbul were selected as ROA (Return on Assets), ROIC-ROC (Return on Invested Capital), ROCE (Return on Capital Employed), P/E (Price Earnings Ratio) and TD/TA (Leverage Ratio). While ROA, ROIC (ROC) and ROCE are profitability indicators, P/E is the market indicator and TD/TA is the liquidity ratio. All data in this scope were obtained from the Bloomberg database. In the ongoing part of the study, whether there is a significant difference between the averages before and after integrated reporting for each bank was investigated with both descriptive statistics and the Man-Whitney U test, which is a non-parametric method. In this context, the public banks operating in Turkey and traded in BIST (Halkbank and Vakıfbank) and then private banks (Akbank, Garanti Bankası, İş Bankası, Albaraka Türk, QNB Finansbank, Şekerbank, Türkiye Sinai Kalkınma Bankası (TSKB) and Yapı Kredi Bankası) were analyzed.

## 3. FINDINGS

Of the banks included in the analysis, Halkbank published a total of five integrated reports between 2020-2024. Vakıfbank published a total of five between 2019-2024; Akbank published a total of five between 2020-2024; Garanti Bankası published a total of eight between 2017-2024; İş Bankası published a total of seven between 2018-2024; Albaraka Türk published a total of three between 2022-2024; QNB Finansbank published a total of two between 2023-2024; Şekerbank published a total of four between 2021-2024; Türkiye Sanayi ve Kalkınma Bankası published a total of nine between 2016-2024 and Yapı Kredi Bankası published a total of six integrated reports between 2019-2024.

There is no statistically significant relationship between the average values of ROA ($p=0.421$), ROIC (ROC) ($p=0.548$), ROCE ($p=0.690$), P/E ($p=0.151$) before and after integrated reporting for Halkbank. There is a significant difference ($p=0.032$) between the averages at 5% significance level in the TD/TA criterion. As a result, Halkbank's leverage ratio increased after integrated reporting. Therefore, Halkbank increased its debt utilization ratio by implementing integrated reporting. There was no change in terms of other performance indicators. The same methods were applied to the other nine banks in the analysis section of this study. It is seen that the findings for each bank differ significantly as shown in Table 1.

**Table 1.** Summary of Mann-Whitney U Tests

| Bank Name | Financial Performance Ratios | | | | |
|---|---|---|---|---|---|
| | ROA | ROIC | ROCE | P/E | TD/TA |
| Halkbank | 0,421 | 0,548 | 0,690 | 0,151 | 0,032** |
| Vakıfbank | 0,699 | 0,937 | 0,589 | 0,240 | 0,310 |
| Akbank | 0,095* | 0,095* | 0,151 | 0,151 | 0,690 |
| Garanti Bankası | 0,645 | 0,038** | 0,721 | 0,002*** | 0,000*** |
| İş Bankası | 0,805 | 0,318 | 0,456 | 0,026** | 0,017** |
| Albaraka Türk | 0,100 | 0,100 | 0,100 | 0,100 | 0,200 |
| QNB Finansbank | 0,667 | 0,667 | 0,667 | 1,000 | 0,667 |
| Şekerbank | 0,029** | 0,029** | 0,029** | 0,057* | 0,686 |
| TSKB | 0,340 | 0,340 | 0,796 | 0,014** | 0,011** |
| Yapı Kredi | 0,485 | 0,180 | 0,310 | 0,240 | 0,240 |

*p<0,10; **p<0,05; ***p<0,01

As can be seen from Table 1, there is no significant difference in terms of ROA, ROIC(ROC) and ROCE before and after the integrated report of the banks, but there is a partially significant difference in price earnings ratios (P/E) and leverage ratios (TD/TA). Therefore, it is important to look at the general table given in Table 2 after the individual views of the banks in terms of reliability and consistency of the analysis results.

**Table 2.** Comparison of Private Banks Before and After Integrated Reporting

| Değişken | Dönem | N | Min. | Max. | Ortalama | S.S. | MWU | p |
|---|---|---|---|---|---|---|---|---|
| ROA | 1 | 44 | -2,36 | 3,69 | 1,61 | 1,04 | 591 | 0,004*** |
| | 2 | 44 | 0,88 | 6,29 | 2,58 | 1,46 | | |
| ROIC (ROC) | 1 | 44 | -10,53 | 10,92 | 3,58 | 2,86 | 479,5 | 0,000*** |
| | 2 | 44 | 1,55 | 26,63 | 8,12 | 6,32 | | |
| ROCE | 1 | 44 | -35,33 | 51,87 | 14,28 | 10,88 | 494 | 0,000*** |
| | 2 | 44 | 8,97 | 55,59 | 25,86 | 13,88 | | |
| P/E | 1 | 43 | 2,89 | 33,70 | 8,64 | 5,01 | 316 | 0,000*** |
| | 2 | 44 | 1,69 | 29,06 | 5,34 | 5,11 | | |
| TD/TA | 1 | 44 | 7,88 | 84,28 | 36,42 | 24,01 | 707,5 | 0,061* |
| | 2 | 44 | 7,07 | 87,72 | 33,38 | 26,84 | | |

*p<0,10; **p<0,05; ***p<0,01

In Table 2, the years before integrated reporting of private banks (eight banks in total) are grouped as (1) and the years when they made integrated reports are compared as (2). Therefore, in Table 2, it was tested whether there was a significant difference between the years before integrated reporting (1) and the years when integrated reports were published (2) with the Mann-Whitney U Test (MWU). While finding the values of (2) in the analysis in question, information on the Integrated Reporting Turkey Network (ERTA) website was used and the years when the banks included in the analysis made integrated reports were determined. According to Table 2, there was a significant increase in the profitability rates of the private banks included in the analysis. There was a decrease in the price earnings ratios and liquidity ratios. Certainly, rather than individual results, the aggregate analysis is more important both statistically and in terms of consistency. It was observed that these findings in Table 2 regarding private banks were different in public banks, in other words, the coefficients were generally insignificant.

## 4. CONCLUSION

Integrated reporting is the latest point in corporate reporting. Today, companies are rapidly switching from financial reporting, activity reporting or sustainability reporting to integrated reporting. With integrated reporting, companies provide their internal and external stakeholders with accurate and reliable information. Informing stakeholders about company activities is important in terms of transparency and accountability. Banks, which are the backbone of the financial system in Turkey, have also started publishing integrated reports in recent years. This study examined whether there was a significant difference in the financial performances of public and private banks traded on Borsa Istanbul before and after integrated reporting.

First, analyses were conducted for each bank in the study and it was determined that the findings were not consistent, in other words, they were in different directions. Then, collective analyses were conducted and the results were generally interpreted. According to the findings, it was observed that integrated reporting in private banks had a positive effect on bank profitability indicators. In other words, there was a statistically significant difference in the financial performances of private banks before and after integrated reporting. In summary, according to the analyses conducted in this study, publishing integrated reports has a positive effect on financial indicators. This result is in line with the findings of Baboukardos and Rimmel (2016) and contradicts the findings of Yüksel (2018). On the other hand, it was concluded that there was no statistically significant difference in the financial performance of public banks before and after integrated reporting.

This study has significant limitations due to the fact that there is no data set based on a long history in Turkey in this area and that Turkey's money and capital markets are generally unstable and open to speculation and manipulation. Therefore, more reliable findings can be reached by using a more comprehensive data set and different analysis methods in future studies. In this context, interesting findings in terms of literature and practice can be reached especially by systematically examining the content quality of integrated reports. As a result, integrated reporting is a very new approach for the Turkish banking sector and it would be beneficial to increase the quantity and quality of conceptual studies in this area.

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# THE EFFECT OF NON-AUDITING SERVICES ON AUDIT REPORT LAG: BIST ALL INDEX APPLICATION

**Nesil İşbil*, Emin Zeytinoğlu****

**ABSTRACT**

**In this study, which investigates the effect of non-audit services on audit report lag, panel data analysis was applied to data from 212 companies listed on the BIST ALL index for the years 2020–2023. In the model where audit report lag is specified as the dependent variable, fees paid for non-audit services and the provision of non-audit services were included as independent variables. Additionally, various factors reported in the literature to have an impact on audit report lag were also added to the model as control variables. The results of the study, based on the Driscoll-Kraay estimator, indicate that fees paid for non-audit services have a positive and statistically significant effect on audit report lag. Conversely, the provision of non-audit services was found to have a negative and significant impact on audit report lag.**

**Keywords*:*** Audit Report Lag, Non-Auditing Service, Audit Fee, Non-Auditing Service Fee, BIST ALL**.**

## DENETİM DIŞI HİZMETLERİN DENETİM RAPORU GECİKMESİNİN ETKİSİ: BIST TÜM ENDEKS UYGULAMASI

**ÖZET**

**Denetim dışı hizmetlerin denetim raporu gecikmesi üzerindeki etkisinin araştırıldığı bu çalışmada BIST TUM endeksinde yer alan 212 şirketin 2020-2023 yıllarına ait verilerine panel veri analizi yöntemi uygulanmıştır. Denetim raporu gecikmesinin bağımlı değişken olarak yer aldığı modele denetim dışı hizmetlere ödenen ücretler ve denetim dışı hizmet alma durumu bağımsız değişken olarak dahil edilmiştir. Literatürde denetim raporu gecikmesi üzerinde etkili olduğu belirtilen çeşitli faktörler de modele kontrol değişkeni olarak eklenmiştir. Driscoll Kraay tahmincisinin kullanıldığı bu çalışma sonucunda denetim dışı hizmetlere ödenen ücretlerin denetim raporu gecikmesi üzerinde pozitif ve anlamlı bir etkisinin olduğu görülmüştür. Denetim dışı hizmet alma durumunun ise denetim raporu gecikmesi üzerinde negatif yönlü ve anlamlı bir etkiye sahip olduğu belirlenmiştir.**

**Anahtar Kelimeler:** Denetim Raporu Gecikmesi, Denetim Dışı Hizmet, Denetim Ücreti, Denetim Dışı Hizmet Ücreti, BIST TÜM.

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## 1. INTRODUCTION

The purpose of this study is to investigate the impact of non-audit services, including assurance, tax, consulting and other similar services other than annual financial statement audit, on audit report lag. A review of the literature reveals that similar studies with comparable objectives exist in the literature (Knechel & Sharma, 2012; Knechel et al., 2012; Lai, 2023). However, it has been observed that domestic studies examining the determinants of audit report lag have not sufficiently addressed the impact of non-audit services. Therefore, this study is expected to contribute to the literature by filling this gap.

Within the scope of the research, data were obtained from the financial reports of 212 non-financial firms listed on the BIST ALL index for the years 2020 to 2023. The Public Oversight, Accounting and Auditing Standards Authority of Turkey (KGK) has mandated that, as of 2021, companies are required to disclose in the footnotes of their financial statements the audit fees paid for the services received, along with a comparison to the prior fiscal year. Therefore, the first data that can be accessed belongs to 2020. The latest data that can be accessed during the period when the study was conducted belongs to 2023. Hence, the dataset used in the study covers the years 2020 through 2023.

## 2. METHODOLOGY

Given that the dataset used in this study spans multiple years, panel data analysis—combining both cross-sectional and time series dimensions—was deemed the most appropriate method for obtaining robust and reliable results. Accordingly, the following panel data model was employed in the study:

$$ARLLOG_{it} = \beta_0 + \beta_1 NASFLOG_{it} + \beta_2 NAS_{it} + \beta_3 CSLOG_{it} + \beta_4 AS_{it} + \beta_5 AO_{it} + \beta_6 ROA_{it} + \beta_7 P/L_{it} + \beta_8 LR_{it} + u_{it}$$

Where:

- **ARLLOG**: Logarithm of audit report lag (number of days between fiscal year-end and audit report date)
- **NASFLOG**: Logarithm of fees paid for non-audit services
- **NAS**: Dummy variable for receipt of non-audit services (1= received,  = not received)
- **CSLOG**: Logarithm of company size (total assets)
- **AS**: Auditor size dummy (1 = Big Four, 0 = non-Big Four)
- **AO**: Audit opinion dummy (1 = unqualified, 0 = otherwise)
- **ROA**: Return on assets
- **P/L**: Profit/loss dummy (1 = profit, 0 = loss)
- **LR**: Leverage ratio

To determine the most appropriate panel data estimation technique, a series of diagnostic tests were conducted, including tests for unit and time effects, the Hausman test, multicollinearity diagnostics, as well as tests for autocorrelation and heteroskedasticity. The results indicated the presence of both unit and time effects, and a violation of the homoskedasticity assumption. Based on the Hausman test, the fixed effects model was deemed appropriate. However, due to data limitations, cross-sectional dependence tests could not be performed, suggesting the need to consider potential cross-sectional correlation. Considering the heteroskedasticity and the possibility of cross-sectional dependence, the Driscoll-Kraay estimator was chosen for the analysis.

## 3. FINDINGS

The results of the Driscoll-Kraay estimator are presented in Table 1. The application of the Driscoll-Kraay estimator revealed that fees paid for non-audit services have a positive and statistically significant effect on audit report lag, whereas the provision of non-audit services has a negative and significant effect. Among the control variables, company size and audit opinion were found to have a positive and significant impact on audit report lag. In contrast, return on assets, profitability status, and leverage ratio had a negative and statistically significant effect. Additionally, the auditor size variable did not have a statistically significant effect on audit report lag.

**Table 1.** Driscoll-Kraay Estimator Results

| Variables | Coefficients | t-statistic | Probability Values | Standard Error |
|---|---|---|---|---|
| NASFLOG | 0.0059 | 2.68 | 0.008* | 0.0022 |
| NAS | -0.0317 | -2.87 | 0.005* | 0.0110 |
| CSLOG | 0.1664 | 2.76 | 0.006* | 0.0603 |
| AS | 0.0020 | 0.08 | 0.938 | 0.0264 |
| AO | 0.0370 | 5.15 | 0.000* | 0.0072 |
| ROA | -0.0019 | -4.34 | 0.000* | 0.0004 |
| P/L | -0.0571 | -2.06 | 0.041** | 0.0278 |
| LR | -0.1519 | -3.64 | 0.000* | 0.0417 |
| Constant | 0.3641 | 0.67 | 0.504 | 0.5434 |
| Within $R^2$ | 0.2942 | | | |
| F statistic | 11.09 | | | |
| Probability (Prob>F) | 0.0000 | | | |

*, ** indicate significance at 1% and 5% significance levels, respectively.

## 4. CONCLUSION

The results show that as the fee for non-audit services increases, the audit report lag also increases. However, the purchase of non-audit services alone is associated with a shorter audit report lag. In other words, while purchasing non-audit services tends to reduce audit report lag, higher fees paid for these services lead to a longer lag.

Among the control variables, only the type of audit firm did not show a significant relationship with audit report lag. There is a positive and significant relationship between auditor opinion and audit report lag, and a negative and significant relationship between Return on Assets (ROA), Profit/Loss (P/L), and Leverage Ratio (LR) and audit report lag.

When comparing our findings with previous studies literature (Knechel & Sharma, 2012; Knechel et al., 2012; Lai, 2023), we observe a generally similar result: the purchase of non-audit services is negatively associated with audit report lag. However, in the Turkish context, the effect of the fees paid for these services differs. The higher the fee, the longer the lag, which contradicts the findings of other studies.

In Lai (2023)’s study, different types of non-audit services are analyzed separately. However, we were unable to do this in our study because audit fee disclosures in Turkey do not provide such detailed information. We considered the non-audit service fee as a whole. In fact, the Public Oversight Accounting and Auditing Standards Board issued a new statement in 2023 specifying how audit and non-audit fees should be disclosed. Future studies could analyze different types of non-audit services separately to further explore the results.

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VIII. INTERNATIONAL SYMPOSIUM ON ACCOUNTING AND FINANCE
Cohosted by MUFAD and Mudanya University
Faculty of Arts and Social Sciences
25-26 July 2025- ONLINE

# GOVERNANCE QUALITY AND CAPITAL MARKET INTERACTION: AN EMPIRICAL STUDY ON THE BIST 100 INDEX

**Serkan Şengül[*], Hakan Yıldız[**]**

## ABSTRACT

**This study aims to examine the long-term relationship between governance quality and capital market performance in Türkiye. In this regard, the relationship between six key governance indicators (control of corruption, government effectiveness, political stability and absence of violence/terrorism, regulatory quality, rule of law, and participation-accountability) obtained from the Worldwide Governance Indicators (WGI) dataset provided by the World Bank and the BIST 100 index has been analyzed. First, the stationarity levels of the variables were determined using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, and it was found that all variables were first-order integrated. Then, the Johansen cointegration test was applied to reveal the existence of a long-term relationship between the variables. The Fully Modified Ordinary Least Squares (FMOLS) method was preferred for long-term coefficient estimates. The findings indicate that governance components such as political stability and the rule of law have significant and positive effects on the BIST 100 index. The study emphasizes that governance reforms in Türkiye can contribute to financial market performance and offers important insights for policymakers.**

**Keywords:** Governance Quality, BIST 100 Index, FMOLS, Turkish Economy

## YÖNETİŞİM KALİTESİ VE SERMAYE PİYASASI ETKİLEŞİMİ: BIST 100 ENDEKSİ ÜZERİNE AMPİRİK BİR İNCELEME

## ÖZET

**Bu çalışma, Türkiye'de yönetişim kalitesi ile sermaye piyasası performansı arasındaki uzun dönemli ilişkiyi incelemeyi amaçlamaktadır. Bu doğrultuda, Dünya Bankası tarafından sunulan Worldwide Governance Indicators (WGI) veri setinden elde edilen altı temel yönetişim göstergesi (yolsuzluğun kontrolü, hükümet etkinliği, siyasi istikrar ve şiddet/terörün yokluğu, düzenleyici kalite, hukukun üstünlüğü ve katılım-hesap verebilirlik) ile BIST 100 endeksi arasındaki ilişki analiz edilmiştir. Öncelikle, değişkenlerin durağanlık düzeyleri Augmented Dickey-Fuller (ADF) ve Phillips-Perron (PP) testleri ile belirlenmiş, tüm değişkenlerin birinci dereceden bütünleşik olduğu tespit edilmiştir. Ardından Johansen eşbütünleşme testi uygulanarak değişkenler arasında uzun dönemli bir ilişkinin varlığı ortaya konmuştur. Uzun dönem katsayı tahminleri için Tamamen Modifiye Edilmiş Sıradan En Küçük Kareler (FMOLS) yöntemi tercih edilmiştir. Elde edilen bulgular, özellikle siyasi istikrar ve hukukun üstünlüğü gibi yönetişim bileşenlerinin BIST 100 endeksi üzerinde anlamlı ve pozitif etkiler yarattığını göstermektedir. Çalışma, Türkiye'de yönetişim reformlarının finansal piyasa performansına katkı sağlayabileceğini vurgulamakta ve politika yapıcılar için önemli çıkarımlar sunmaktadır.**

**Anahtar Kelimeler:** Yönetişim Kalitesi, BIST 100 Endeksi, FMOLS, Türkiye Ekonomisi

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## 1. INTRODUCTION

With the increasing complexity of global financial markets, investor decisions are now shaped not only by macroeconomic indicators but also by institutional factors such as governance quality. Particularly in developing countries like Türkiye, understanding the relationship between governance and financial markets has gained relevance both academically and practically. As Kaufmann, Kraay, and Mastruzzi (2004) define, governance refers to the exercise of public authority, the formulation and implementation of public policies, and the interaction between the state and its citizens. In this context, the Worldwide Governance Indicators (WGI) developed by Kaufmann and Kraay (2008) offer a multidimensional assessment of governance through six key indicators: Government Effectiveness, Rule of Law, Control of Corruption, Regulatory Quality, Political Stability and Absence of Violence, and Voice and Accountability. These indicators provide cross-country comparable data that allow for the examination of how governance structures influence economic and financial dynamics.

The literature identifies three main channels through which governance influences markets: it reduces information asymmetry, thereby boosting investor confidence; lowers transaction costs to enhance efficiency; and decreases uncertainty, which in turn reduces risk premiums. As discussed by Williams and Siddique (2008), these mechanisms collectively strengthen market stability. Additionally, empirical findings by Thomas (2010) and Arndt (2009) demonstrate that stronger adherence to the rule of law and more effective anti-corruption measures play a critical role in attracting capital flows and improving overall market performance. In emerging markets, Lehkonen and Heimonen (2015) demonstrated that political stability and institutional quality reduce volatility and improve returns. Similarly, Modugu and Dempere (2020) found that rule of law and political stability positively affect stock markets in GCC countries, while regulatory quality and accountability may produce adverse effects. For developed economies, Farooq et al. (2020) showed that higher governance scores are associated with better market outcomes, supporting the role of institutional trust in financial development. Case studies like Abutaber et al. (2021) also highlight that governance enhances firm-level performance.

Despite the growing international evidence, studies focusing specifically on Türkiye remain limited. The BIST 100 index, which represents the performance of the country’s most prominent and liquid companies, serves as a key indicator for assessing how variations in governance influence investor behavior. As highlighted in the work of Boubakri et al. (2012), and also in the earlier study by Knack, et al. (2003), institutional quality becomes a decisive factor in shaping both domestic and foreign investment preferences, especially in contexts marked by political uncertainty, regulatory fragility, or heightened perceptions of corruption. Within this framework, the present study empirically analyzes the effects of the six governance indicators provided by the World Bank’s WGI on the BIST 100 index. In doing so, it aims to fill a gap in the literature on Türkiye and provide evidence-based insights for policymakers seeking to enhance governance capacity and financial market stability.

## 2. DATA AND METHODOLOGY

In this study, six governance indicators from the World Bank’s Worldwide Governance Indicators (WGI) dataset were used to evaluate the quality of governance across countries. These indicators, expressed in percentile ranks from 0 (lowest) to 100 (highest), include Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability. Each reflects a different dimension of institutional capacity and public sector performance that can shape investor confidence and market dynamics.

To examine the long-run relationship between these governance dimensions and Türkiye's BIST 100 index, standard unit root tests—namely the Augmented Dickey-Fuller and Phillips-Perron tests—were applied, as originally developed by Dickey and Fuller (1979) and Phillips and Perron (1988). All variables were found to be integrated of order one [I(1Given this, the Johansen cointegration method developed by Johansen (1988) and further expanded with Juselius (1990) was implemented to test whether a long-term equilibrium relationship exists among the variables. Establishing cointegration justified the use of the Fully Modified Ordinary Least Squares (FMOLS) technique for estimating long-run coefficients, thereby enhancing the reliability of interpretations concerning the influence of governance on stock market performance.

The FMOLS method, introduced by Pedroni (2000), corrects for potential biases in traditional estimators, particularly in small samples, by addressing issues such as endogeneity and serial correlation. This makes it well-suited for empirical models where independent variables may correlate with the error term. Moreover, FMOLS accommodates cross-sectional heterogeneity, which is especially relevant in the context of regional differences across Türkiye. FMOLS approach is described as follows:

$$\hat{\beta}_{FMOLS} = \left(\sum_{i=1}^{N} X'_{it} X_{it}\right)^{-1} \sum_{i=1}^{N} X'_{it} \left(y_{it} - \hat{\gamma}_{it}\right) \tag{1}$$

Here $\hat{\gamma}_{it}$ is a correction term for the joint effect of error terms and independent variables. Pedroni (2000) shows that the FMOLS method yields effective results even in small samples. This feature is very important for the panel data set used in our study. FMOLS is an optimal method for long-run coefficient estimation in models assuming cointegration relationships. The FMOLS method has reliably estimated the long-run relationships between variables by considering the heterogeneity between cross-sectional units in panel data analysis.

## 3. EMPIRICAL RESULTS

Both Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests were applied to determine the stationarity properties of all series used in the study. According to the results of both tests, it was found that the series were not stationary at their levels, but became stationary when their first differences were taken. Accordingly, it was concluded that all variables were I(1), i.e., first-order integrated. The fact that the variables are integrated to the same degree allows for the investigation of possible long-term equilibrium relationships between them. In this context, the Johansen cointegration test was applied, and it was determined that there is at least one cointegration vector between the variables. Thus, the existence of long-term relationships between the variables was statistically confirmed. These findings indicate that there are no methodological obstacles to making long-term coefficient estimates and that the Fully Modified Ordinary Least Squares (FMOLS) method is applicable in the analysis. The FMOLS analysis was preferred because it can reliably estimate long-term relationships between cointegrated series by eliminating deviation problems.

**Table 1.** FMOLS Results

| Variables | Coefficient | Std. Error | Prob. |
|---|---|---|---|
| government | -49.774 | 17.989 | 0.006 |
| stability | 27.354 | 13.707 | 0.046 |
| regularity | 84.187 | 19.738 | 0.000 |
| law | 20.222 | 19.392 | 0.297 |
| corruption | -39.622 | 11.132 | 0.000 |
| accountability | 225.952 | 18.823 | 0.000 |
| trend | -657.859 | 50.020 | 0.000 |
| quadratic trend | 33.810 | 1.808 | 0.000 |
| constant | -8749.002 | 1078.123 | 0.000 |
| R-squared | | 0.8184009 | |
| Adj. R-squared | | 0.7376902 | |
| S.E. of regression | | 181.2191 | |

According to Table 1, the FMOLS estimation results indicate significant long-run relationships between governance indicators and stock market performance. In particular, government effectiveness and control of corruption have statistically significant negative effects, suggesting that inefficiencies in public administration and higher perceived levels of corruption adversely affect market outcomes. Conversely, political stability, regulatory quality, and voice and accountability all demonstrate positive and significant effects, indicating that a stable political environment, well-functioning regulatory structures, and democratic participation mechanisms support stronger market performance. Notably, the coefficient for voice and accountability stands out as the most influential among the governance indicators, underlining the importance of transparency and civic engagement in sustaining investor confidence and market development.

The model also includes both linear and quadratic trend components, capturing the structural evolution of the market over time. The overall explanatory power of the model is high, as indicated by a strong R-squared value, suggesting that governance-related factors account for a substantial portion of the variation in stock market performance. These findings align with the broader literature emphasizing the role of institutional quality in shaping financial outcomes and reinforce the argument that improving governance dimensions can enhance long-term capital market efficiency and resilience.

## 4. DISCUSSION AND CONCLUSION

The empirical results of the study reveal distinct and statistically significant long-term relationships between various governance dimensions and the performance of Türkiye's BIST 100 index. Among the governance indicators analyzed, government effectiveness and control of corruption display significant negative coefficients. These findings imply that inefficiencies in public administration, such as bureaucratic delays or lack of service quality, along with high levels of perceived corruption, erode investor confidence. The detrimental effects observed suggest that such governance weaknesses create uncertainty, reduce transparency, and hinder the predictability that investors seek, thereby exerting a suppressive influence on market performance. These results align with the conclusions drawn by Knack et al. (2003) and Boubakri et al. (2012), who emphasized that low institutional quality in emerging markets discourages capital inflows and destabilizes investor sentiment.

On the other hand, the analysis identifies three governance components—political stability, regulatory quality, and voice and accountability—that exhibit positive and statistically significant impacts on the BIST 100 index. The presence of political stability reassures investors by mitigating risks of abrupt policy changes or social unrest, thereby supporting long-term capital commitments. Similarly, a high level of regulatory quality signals the presence of consistent, transparent, and effective rules that facilitate business activity and fair competition. Most notably, the variable voice and accountability demonstrates the strongest positive effect among all indicators. This outcome underlines the vital role of democratic institutions, civic participation, and freedom of expression in shaping investor expectations and ensuring institutional credibility. The importance of these positive governance dimensions is corroborated by findings from Lehkonen and Heimonen (2015) and Farooq et al. (2020), who showed that governance reforms can foster deeper, more resilient financial markets.

In summary, this study contributes to the growing body of evidence suggesting that institutional quality is a key determinant of stock market performance, even in a developing country context like Türkiye. It provides empirical support for the view that improving democratic governance, enhancing regulatory environments, and reducing corruption are not only politically desirable but economically beneficial for market development. The results carry important implications for policymakers, highlighting the necessity of broad-based governance reforms to ensure market stability and long-term economic resilience.

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# EFFECT OF BLOCKCHAIN TECHNOLOGY ON ACCOUNTING AND SUSTAINABILITY

**Begüm Öktem** *

**ABSTRACT**

**The concept of blockchain, which came to the fore with technological developments, is a system based on a decentralized database that emerged in the early 2000s. The purpose of the study is to examine the impact of blockchain technology on the traditional accounting system and sustainability at a theoretical level. For this reason, in the study, firstly, the concept of blockchain is briefly explained. Then, the role of accountants is evaluated within the scope of the impact of blockchain technology on accounting. In the last part, energy consumption and carbon emissions are examined within the scope of the impact of blockchain technology on sustainability.**

**Keywords:** Blockchain, Accounting, Sustainability.

## BLOCKCHAIN TEKNOLOJİSİNİN MUHASEBEYE VE SÜRDÜRÜLEBİLİRLİĞE ETKİSİ

**ÖZET**

**Teknolojik gelişmeler ile birlikte gündeme gelen blockchain kavramı 2000'li yılların başında ortaya çıkan ve merkezi olmayan veritabanına dayanan bir sistemdir. Çalışmanın amacı, blockchain teknolojisinin geleneksel muhasebe sistemine ve sürdürülebilirliğe etkisini teorik düzeyde incelemektir. Bu nedenle çalışmada öncelikle blockchain kavramı kısaca açıklanmıştır. Ardından blockchain teknolojisinin muhasebeye etkisi kapsamında muhasebecilerin rolü değerlendirilmiştir. Son kısımda ise, blockchain teknolojisinin sürdürülebilirliğe etkisi kapsamında; enerji tüketimi ve karbon salınımı incelenmiştir.**

**Anahtar Kelimeler:** Blockchain, Muhasebe, Sürdürülebilirlik.

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## 1. INTRODUCTION

Blockchain is basically a database containing records of transactions distributed and verified by a computer network. Instead of a single central authority like a bank, the records are controlled by a large community and no one has control over it, no one can go back and change or delete the transaction history. Compared to a traditional central database, the information cannot be changed due to the blockchain's built-in distributed structure and peer-verified guarantees (Sarmah, 2018:23).

The aim of the study is to evaluate the changing role of accountants with blockchain technology and to examine the impact of blockchain technology on sustainability. In this context, the research questions are as follows: "How has the role of accountants changed with blockchain technology? What are the advantages and disadvantages of blockchain technology on accounting? What are the effects of blockchain technology on sustainability?" In the study, the changing role of accountants within the scope of the impact of blockchain technology on accounting (Garanina et al., 2022) is evaluated and the advantages and disadvantages of blockchain technology on accounting (Han et al., 2023; Maiti et al., 2021) are included. Then, the impact of blockchain technology on sustainability (Böhme et al., 2015; Casey, 2022, Mourtzis et al., 2023; O'Hare et al., 2022; Spano et al., 2022) is examined.

It is argued that blockchain technology will radically transform accounting into a triple-entry system, leading to a more efficient and transparent accounting environment. Blockchain will replace the data recognition process in the accounting system from double-entry accounting to a triple-entry system, where each transaction leads to three entries: a debit record, a credit record, and a cryptographic signature that verifies the validity of a transaction. In this system, blockchain is a neutral intermediary responsible for distributing data, automating storage, and verifying the process. It will also serve as a secure accounting platform that does not allow irregular accounting practices. Blockchain will record money exchanges between two parties, such as bill payments and bank deposits, and money flows within a company (Garanina, Ranta and Dumay, 2022: 1518).

The impact of blockchain technology on accounting is to increase efficiency and transparency by adding cryptographic signatures instead of double-sided entry in traditional accounting and providing triple entry. It will be possible to make and store traditional accounting records with blockchain, but accountants will be needed for more specific transactions such as choosing depreciation methods and determining the useful life of tangible fixed assets. Blockchain technology is reduces costs by digitizing accounting documents and enables easy detection of suspicious transactions. However, the disadvantages of bitcoin used in blockchain technology are that it is not currently accepted by governments, it is complex and the transactions are costly.

The impact of blockchain technology on sustainability is the increase in electricity consumption of cryptocurrency mining causes an increase in costs. In addition, bitcoin's carbon emissions have a negative impact on sustainability. In order to reduce this impact; some companies are taking important steps such as providing the bitcoin network with renewable energy and establishing carbon-neutral businesses. In addition to companies, it is important for governments to take encouraging steps to ensure energy efficiency and reduce carbon emissions. In general, a disadvantage arises when it is determined that developed economies benefit from blockchain technologies. Unfortunately, developing countries may have to pay the price for this. Taking advantage of their interdisciplinary bases offers accounting experts a research opportunity to better understand blockchain (Spano et al, 2022: 1503). Software and computer engineering for technological developments and infrastructure, environmental engineering for carbon emissions and renewable energy are examples of these disciplines. Thus, it will be possible to understand and analyze blockchain for developing countries, including our country.

## 2. METHODOLOGY

The advantages and disadvantages of Blockchain technology in accounting are summarized in the table below:

**Table 1.** Advantages and disadvantages of blockchain technology in accounting

| ADVANTAGES | DISADVANTAGES |
|---|---|
| *Digitizes documents, increases efficiency, reduces costs, reduces human error, automates agreement.<br>*Blockchain-powered smart contracts enable automatic execution of agreements when predetermined conditions are met and facilitate real-time transactions.<br>*Agreements are encoded and executed in a shared, immutable environment, creating an audit trail.<br>*Blockchain provides transparency, visibility, provenance, and immutable records that increase security. Any suspicious fund transfers will be observed and detected in real time.<br>*Automates compliance processes with smart contracts, providing faster and more accurate reporting. Allows real-time monitoring between regulators and regulated entities.<br>*Blockchain eliminates information imbalances between market participants, increases transparency | *Stakeholder adaptation to sudden changes in policy is a challenging process.<br>*Creating awareness and educating stakeholders on new policies is difficult.<br>*Cryptocurrencies using blockchain technologies in most countries today are not supported by the relevant governments.<br>*Ensuring general synchronization of different solutions: universal accounting data standard, storage management, scalable blockchains, security, computing interfaces and a sustainable framework that manages all these modules with an effective strategy for global implementation are required.<br>*The common goal of stakeholders should be preferred over their own goals to build trust.<br>*Currently, the Covid-19 pandemic is becoming an obstacle and a certain area may be less preferred by government bodies. A similar situation may occur in the future<br>*Investment in technological development is a very complex and long process.<br>*It is difficult to comply with social accounting and integrated reporting.<br>*Many transactions are carried out with manual documents in accounting.<br>*It is a time-consuming process.<br>*There is a lack of mechanisms to track transactions from different ledgers.<br>*It presents a view open to fraud.<br>*It is complex and costly for businesses.<br>*Intermediaries are involved in many processes. |

Source: Han et al., 2023:4; Maiti, Kotliarov and Lipatnikov,2021:5.

## 3. FINDINGS

The relationship between blockchain technology and sustainability can be examined in two dimensions, positive and negative. These effects are explained below.

### 3.1. Negative Impact of Blockchain Technology on Sustainability

As miners update the blockchain, computational efforts carry significant costs. In particular, computerized proof-of-work calculations are quite power-consuming. These computational costs have increased sharply. Because, as more computing power is added to the Bitcoin system, puzzles automatically become more difficult and computing and electricity requirements increase (Böhme, Christin, Edelman and Moore, 2015: 218).

47 percent of the Bitcoin network emits a lot of carbon. The Cambridge Center for Alternative Finance's mid-range estimate is that the total network currently consumes about 84 terawatt hours of electricity per year, or about 0.38 percent of total world consumption. This is because Bitcoin's proof-of-work algorithm is quite energy-intensive (Casey, 2022: 26).

Bitcoin has a high carbon footprint. In 2020, the bitcoin network reportedly consumed 131.80 TWh of power to run the algorithms that power its "mining" operations. This is equivalent to the electricity consumed by Argentina (WEF, 2021, www.weforum.org ). Additionally, bitcoin activities are estimated to produce sixty-five megatons of carbon dioxide ($CO_2$) annually (Mourtzis et al., 2023:12).

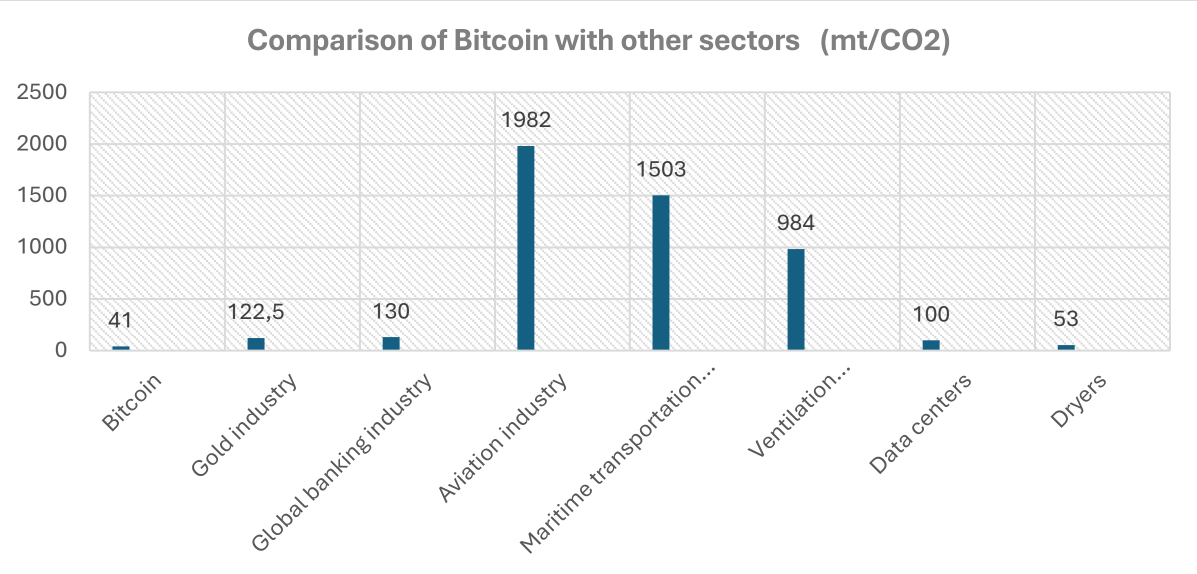


**Figure 1.** Bitcoin's carbon emissions compared to other sectors
Source: O'Hare, Fairchild and Ali, 2022: 66.

When Figure 1 is examined, it is seen that the aviation sector and the maritime transportation sector cause the highest estimated carbon emissions. The Bitcoin industry, on the other hand, has lower estimated carbon emissions compared to global banking systems and gold mining.

### 3.2. The Positive Impact of Blockchain Technology on Sustainability

Crypto technology allows facilities equipped with provably secure sensors and blockchain-based monitoring systems to verify that they are producing renewable energy and then instantly present this information as unique, one-off tokens. According to the Cambridge Center for Alternative Finance, 53 percent of the Bitcoin network is powered by renewable energy; this is not because miners are altruistic, but because they are seeking profit. Now that bitcoin prices have fallen and Intel's new Blockscale application-specific integrated circuits (ASICs) are ready to create a glut of cheap chips for miners, the availability of low-cost energy will become a major factor in every miner's expansion plans (Casey, 2022: 25).

World Economic Forum policy analyst Cheikosman surprisingly stated that "Crypto is becoming an important part of developing a carbon neutral energy grid and has made it economically viable to invest, develop and build renewable energy generation." (O'Hare, Fairchild and Ali, 2022:70).

A disadvantage arises when it is found that generally developed economies are benefiting from blockchain technologies. Unfortunately, developing countries may have to pay the price. Leveraging their interdisciplinary base offers accounting professionals a research opportunity to better understand blockchain (Spano et al, 2022:1503).

## 4. CONCLUSION

The impact of blockchain technology on accounting is that it increases efficiency and transparency by providing triple entry by adding cryptographic signature instead of double entry in traditional accounting. With Blockchain, it will be possible to make and store traditional accounting records, but accountants will be needed for more specific transactions such as choosing depreciation methods and determining the useful life of tangible fixed assets. Blockchain technology is reduces costs by digitizing accounting documents, suspicious transactions can be easily detected. However, the disadvantages of Bitcoin used in blockchain technology are that it is not currently accepted by governments, it is complex, and the transactions are costly.

The effect of Blockchain technology on sustainability is that the increase in electricity consumption of cryptocurrency mining causes an increase in costs. In addition, Bitcoin's carbon emission has a negative effect on sustainability. In order to reduce this effect; some companies are taking important steps such as providing the Bitcoin network with renewable energy and establishing a carbon-neutral business. It is important for governments as well as companies to take encouraging steps to ensure energy efficiency and reduce carbon emissions.

In addition, accounting experts can be provided with advantages with interdisciplinary fields. Software and computer engineering for technological developments and infrastructure, environmental engineering for carbon emission and renewable energy are examples of these disciplines. Thus, it will be possible to understand and analyze blockchain for developing countries, including our country.

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# THE ADVENTURE OF EMBEDDED FINANCE IN TÜRKİYE

**İffet Kesimli***

## ABSTRACT

**This study explores embedded finance in Türkiye. Aside from the literature study, the research progressed in three ways. First, the infrastructure of embedded finance is discussed. Next is the assessment of the current situation for the Turkish context. The data and information on the websites of the most reliable and popular digital shopping industry members in Türkiye were useful for determining the way they benefit from embedded finance. The bibliographic analysis of published works, basically on Web of Science (WoS) ignoring the country data, follows. This will help future research. In the light of the data collected, it is evident that there are very satisfactory embedded finance examples, and consumers embrace embedded finance applications. Also, there is more than enough room for new embedded finance applications in Türkiye. What is required is identification of growth opportunities, expanding the talent possessed, managing the change and transforming to take the lead in embedded finance.**

**Keywords:** Embedded Finance, Financial Inclusion, Blockchain Technology, Fintech, Accounting and Regulations.

## GÖMÜLÜ FİNANSIN TÜRKİYE SERÜVENİ

## ÖZET

**Bu çalışma Türkiye'deki gömülü finansı araştırmaktadır. Literatür çalışmasının yanı sıra araştırma üç şekilde ilerlemiştir. İlk olarak gömülü finansın altyapısı tartışılmıştır. Ardından Türkiye bağlamında mevcut durum tespiti yapılmıştır. Türkiye'deki en güvenilir ve popüler dijital alışveriş sektörü üyelerinin web sitelerindeki veriler ve bilgiler, gömülü finanstan nasıl faydalandıklarını belirlemede yardımcı olmuştur. Ülke verilerini göz ardı ederek temel olarak Web of Science (WoS) üzerinde yayınlanan çalışmaların bibliyografik analizi takip etmektedir. Bu, gelecekteki araştırmalara yardımcı olacaktır. Toplanan veriler ışığında, çok tatmin edici gömülü finans örneklerinin olduğu ve tüketicilerin gömülü finans uygulamalarını benimsediği görülmektedir. Ayrıca, Türkiye'de yeni gömülü finans uygulamaları için fazlasıyla yer vardır. Gerekli olan şey, büyüme fırsatlarının belirlenmesi, sahip olunan yeteneğin genişletilmesi, değişimin yönetilmesi ve gömülü finansı yönlendirecek şekilde dönüştürülmesidir.**

**Anahtar Kelimeler:** Gömülü Finans, Finansal Kapsayıcılık, Blockchain Teknolojisi, Fintek, Muhasebe ve Mevzuat.

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# THE EFFECT OF BUSINESSES' DIGITAL TRANSFORMATION ON EXPORT PERFORMANCE[*]

**Özlem Çelik Demir[**], Dursun Boz[***]**

**ABSTRACT**

**The aim of this study is to examine the impact of digital transformation on the export performance of enterprises. Today, the application and integration of digital technologies affect the business processes of companies in a wide area from production to sales stages and bring innovations. Digitalization provides many benefits to companies such as sales and productivity increases, reorganization of customer interactions and value creation. This change allows enterprises to reshape their business models and become more suitable for customer demands. The development of the internet and the adoption of digital technologies have caused changes in the working methods of enterprises. This change has accelerated the digitalization of different business areas and presented new challenges and opportunities for people who have to spend more time in virtual environments. Export is a critical strategy especially for enterprises that want to open up to international markets, and the effective use of digital technologies is important in order to ensure that enterprises use their resources in the most efficient way and become competitive at the international level. In this context, for the purpose of the study, 155 employees in exporting foreign trade enterprises in the Bağcılar district of Istanbul were reached through a survey on a voluntary basis based on convenience sampling. In line with the data obtained, the regression analysis performed to determine the effects of digital transformation on export performance success yielded a statistically significant result (F=97.866; p=0.000).**

**Keywords***:* Digitalization, Digital Transformation, Export performance

## İŞLETMELERİN DİJİTAL DÖNÜŞÜMÜNÜN İHRACAT PERFORMANSINA ETKİSİ

**ÖZET**

**Bu çalışmanın amacı dijital dönüşümün işletmelerin ihracat performansına olan etkisini incelemektir. Günümüzde dijital teknolojilerin uygulanması ve entegrasyonu, şirketlerin üretimden satış aşamalarına kadar geniş bir alanda iş süreçlerini etkileyerek yenilikler getirmektedir. Dijitalleşme, firmalara satış ve verimlilik artışları, müşteri etkileşimlerini yeniden düzenleme ve değer yaratma gibi birçok fayda sağlamaktadır. Bu değişim, işletmelerin iş modellerini yeniden şekillendirmelerine ve müşteri taleplerine daha uygun hale gelmelerine olanak tanımaktadır. İnternetin gelişmesi ve dijital teknolojilerin benimsenmesi, işletmelerin çalışma yöntemlerinde değişimlere sebep olmuştur. Bu değişim, farklı iş alanlarının dijitalleşmesini hızlandırmış ve sanal ortamlarda daha fazla vakit geçirmek zorunda kalan kişiler için yeni zorluklar ve imkanlar sunmuştur. İhracat, özellikle uluslararası pazarlara açılmak isteyen işletmeler için kritik bir strateji olup, işletmelerin kaynaklarını en verimli şekilde kullanarak uluslararası düzeyde rekabetçi olmalarını sağlamak için dijital teknolojilerin etkili kullanımı önem taşımaktadır. Bu bağlamda çalışmanın amacına yönelik İstanbul Bağcılar ilçesindeki ihracat yapan dış ticaret işletmelerindeki 155 çalışana kolayda örnekleme temelinde gönüllülük esasıyla anketle ulaşılmıştır. Elde edilen veriler doğrultusunda dijital dönüşümün ihracat performansı başarısı üzerindeki etkilerini belirlemek için gerçekleştirilen regresyon analizi istatistiksel açıdan (F=97,866; p=0,000) anlamlı bir sonuç vermiştir.**

**Anahtar Kelimeler:** Dijitalleşme, Dijital Dönüşüm, İhracat performansı

[*] The survey study in the study was decided to be ethically appropriate in the meeting of the Istanbul Gelişim University Rectorate Ethics Committee dated 29.11.2024 and numbered 2024-19-93

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# ASSESSING THE DISCLOSURE PRACTICES OF CONTINGENT LIABILITIES AND CONTINGENT ASSETS UNDER IAS 37: EVIDENCE FROM BIST 30 COMPANIES

**Merve Öz[*], Burcu Adiloğlu[**]**

**ABSTRACT**

**This study examines the disclosure practices of contingent liabilities and contingent assets in the financial statement notes of BIST 30 companies as of the end of the 2024 fiscal year under International Accounting Standard 37 (IAS 37)- Provisions, Contingent Liabilities, and Contingent Assets. Based on a detailed analysis of 2024 financial statement notes, the study investigates disclosures' extent, clarity, and monetary specificity across various industries. The study reveals an inconsistency in disclosure levels among the sectors, with banks demonstrating the highest transparency while the industrial and holding companies generally provides less detailed information. Contingent assets remain notably under-disclosed, indicating a gap between regulatory requirements and current reporting practices. The findings highlight the need for regulatory authorities to establish minimum disclosure standards to ensure comparability, reliability, and relevance of financial reports for stakeholders.**

**Keywords:** IAS 37, Contingent Liabilities, Contingent Assets, BIST 30

## IAS 37 KAPSAMINDAKİ KOŞULLU YÜKÜMLÜLÜKLER VE KOŞULLU VARLIKLARIN AÇIKLAMA UYGULAMALARININ DEĞERLENDİRİLMESİ: BIST 30 ŞİRKETLERİNDEN KANITLAR

**ÖZET**

**Bu çalışma, BIST 30 şirketlerinin 2024 mali yılı sonu itibarıyla finansal tablo dipnotlarında yer alan koşullu yükümlülükler ve koşullu varlıkların Uluslararası Muhasebe Standardı 37 (UMS 37) Karşılıklar, Koşullu Yükümlülükler ve Koşullu Varlıklar kapsamındaki açıklama uygulamalarını incelemektedir. 2024 mali tablo dipnotlarının detaylı bir analizine dayanan çalışma, çeşitli sektörlerdeki açıklamaların kapsamını, netliğini ve parasal özgüllüğünü incelemektedir. Çalışma, sektörler arasında açıklama düzeylerinde bir tutarsızlık olduğunu ortaya koymaktadır. Bankalar en yüksek şeffaflığı gösterirken, sanayi ve holding şirketleri genellikle daha az detaylı bilgi sağlamaktadır. Koşullu varlıklar önemli ölçüde yetersiz açıklanmakta olup, bu durum düzenleyici gereklilikler ile mevcut raporlama uygulamaları arasında bir uçurum olduğunu göstermektedir. Bulgular, düzenleyici otoritelerin, paydaşlar için finansal raporların karşılaştırılabilirliğini, güvenilirliğini ve uygunluğunu sağlamak amacıyla asgari açıklama standartları oluşturması gerektiğini vurgulamaktadır.**

**Anahtar Kelimeler:** UMS 37, Koşullu Yükümlülükler, Koşullu Varlıklar, BIST 30

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## 1. INTRODUCTION

In April 2002, the International Accounting Standards Board adopted IAS 37 Provisions, Contingent Liabilities and Contingent Assets, which the International Accounting Standards Committees initially issued in September 1998. IAS 37 replaced parts of IAS 10 Contingencies and Events Occurring after the Balance Sheet Date that was issued in 1978 and that dealt with contingencies. The standard defines contingent liabilities as “possible obligations whose existence will be confirmed by uncertain future events that are not wholly within the control of the entity.” These liabilities are not recognized because their amount cannot be measured reliably or because settlement is not probable. A contingent liability is not recognized in the statement of financial position, is disclosed in the notes.

Contingent assets are defined as “possible assets whose existence will be confirmed by the occurrence or non-occurrence of uncertain future events that are not wholly within the control of the entity.” Just like in contingent liabilities, contingent assets are not recognized, but they are disclosed when it is more likely than not than an inflow of benefits will occur. When the inflow of benefits is certain an asset is recognized in the statement of financial position, because that asset is no longer considered to be contingent.

The aim of this study is to examine the extent of contingent liability and contingent asset disclosures made by BIST 30 companies in accordance with IAS 37, based on their publicly available consolidated financial statements for the year ended 2024. By analyzing reporting patterns, the study seeks to highlight disclosure deficiencies and provide recommendations for improving transparency and compliance with the standard.

## 2. METHODOLOGY

This study adopts a qualitative content analysis methodology to examine the notes disclosures regarding contingent liabilities and contingent assets in the audited consolidated financial statements of BIST 30 companies for the fiscal year ending December 31, 2024. These financial statements, prepared in accordance with Turkish Financial Reporting Standards (TFRS), which are aligned with IFRS/IAS, were reviewed to identify the nature, extent, and quality of disclosures under IAS 37. The analysis focused on:

- The existence and specificity of disclosures regarding ongoing legal disputes, guarantees, pledges, and other off-balance sheet obligations,
- The treatment of contingent assets such as government incentives, and favorable legal outcomes,
- The consistency of terminology and classification used in disclosures across companies and sectors.

To ensure comparison, the consolidated financial statements and independent auditor’s report of each company as of December 31, 2024, were downloaded from the websites. Both qualitative evaluations and frequency-based tables were employed to identify reporting trends.

## 3. FINDINGS

The analysis reveals considerable variability in the disclosure of contingent liabilities and assets among BIST 30 companies, with key findings summarized below:

- High-level disclosures were found in the banking sector (e.g., İş Bankası, Yapı Kredi, Garanti, Akbank), where companies provide detailed and understandable notes on legal proceedings, risk assessments, provisions recognized, and the stages of litigation.
- Moderate-level disclosures were typical of large industrial firms (e.g., Tüpraş, Ereğli, Petkim), which usually disclose comprehensive details on guarantees, pledges, and mortgages (GDM).
- Low-level disclosures were observed in holding and retail companies (e.g., Koç holding, BİM), where disclosures often consist of aggregate GDM amounts without substantive commentary on risks or conditionality.

- GDM disclosures are present in nearly all financial statements, particularly in companies involved in capital-intensive.
- A striking gap exists in the disclosure of the contingent assets. Very few companies mention favorable legal outcomes, expected insurance recoveries, or government incentives as the potential economic benefits. Even when such items are described in narrative form, they are not systematically classified as contingent assets under IAS 37.
- According to sector-specific observations, banks were the most compliant and transparent, industrial firms were more detailed in disclosing operational risks and GDM arrangements but often lacked legal risk commentary.
- Holdings and retailers exhibited the lowest transparency levels regarding both contingent liabilities and contingent assets.

## 4. CONCLUSIONS

The findings of this study reveal that while Turkish banks listed on the BIST 30 generally meet the disclosure expectations of IAS 37, significant deficiencies remain among industrial and holding companies. Especially, the lack of clear and consistent disclosure of contingent assets highlights a systematic issue in the implementation of the standard.

Several conclusions can be drawn from the study. First, there is a need for harmonization. Disclosure practices vary widely in terms of scope and depth, reducing the comparability across the sectors. Regulatory authorities of Türkiye should consider mandating a minimum disclosure framework to enhance uniformity and accountability. Second, the transparency of contingent assets needs to be improved. Companies must be encouraged to disclose favorable outcomes with a high probability of realization, as required by IAS 37. This would give investors a more balanced view of potential obligations and unrealized benefits. Companies should improve disclosures linking GDM items to contingent liabilities. This will help users of financial statements better understand off-balance sheet risks.

All in all, the study emphasizes that improving the clarity, consistency, and completeness of disclosures under IAS 37 will not only enhance financial statement quality but also contribute to stronger investor confidence and market discipline.

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# APPLICATION OF ACTUARIAL VALUATION METHOD IN TFRS 17 INSURANCE CONTRACTS STANDARD

**Naim Varol***

## ABSTRACT

**TFRS 17 represents a significant overhaul in the accounting of insurance contracts, aiming for greater transparency, consistency, and comparability across the global insurance industry. At its core, TFRS 17 relies heavily on actuarial methods to determine the present value of future cash flows, explicitly adjust for non-financial risk, and account for unearned profit through the Contractual Service Margin (CSM). This article explains in detail how actuarial techniques are applied in three TFRS 17 measurement models with a sample application: the General Measurement Model (GMM), Premium Allocation Approach (PAA), and Variable Fee Approach (VFA). It also explores the role of actuaries in model development, assumption setting, risk adjustment quantification, and CSM amortization.**

**Keywords:** Insurance Contracts, Actuarial Valuation Method, General Measurement Model (GMM), Premium Allocation Approach (PAA), Variable Fee Approach (VFA)

## TFRS 17 SİGORTA SÖZLEŞMELERİ STANDARTINDA AKTÜERYA DEĞERLEME YÖNTEMİNİN UYGULANMASI

## ÖZET

**TFRS 17, küresel sigorta sektöründe daha fazla şeffaflık, tutarlılık ve karşılaştırılabilirlik hedefleyen sigorta sözleşmelerinin muhasebesinde önemli bir yeniden yapılanmayı açıklamaktadır. Özünde, TFRS 17 gelecekteki nakit akışlarının bugünkü değerini belirlemek, finansal olmayan risk için açık bir şekilde ayarlama yapmak ve Sözleşmeye Dayalı Hizmet Marjı (CSM) aracılığıyla kazanılmamış kârı hesaba katmak için büyük ölçüde aktüeryal yöntemlere dayanmaktadır. Bu makale, aktüeryal tekniklerin üç IFRS 17 ölçüm modelinde nasıl uygulandığını örnek bir uygulama ile ayrıntılı olarak açıklamaktadır: Genel Ölçüm Modeli (GMM), Prim Dağıtımı Yaklaşımı (PAA) ve Değişken Ücret Yaklaşımı (VFA). Ayrıca, aktüerlerin model geliştirme, varsayım belirleme, risk ayarlaması ölçümü ve CSM amortismanındaki rolünü de incelemektedir.**

**Anahtar Kelimeler:** Sigorta Sözleşmeleri, Aktüeryal Değerleme Yöntemi, Genel Ölçüm Modeli (GMM), Prim Tahsis Yaklaşımı (PAA), Değişken Ücret Yaklaşımı (VFA)

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# NAVIGATING GLOBAL UNCERTAINTIES: THE FINANCIAL SOUNDNESS OF THE TURKISH BANKING SECTOR IN THE POST-REFORM ERA

**Merve Tuncay***

**ABSTRACT**

**The aim of this study is to reveal how Turkish banking system reacts to positive and negative shocks from global uncertainty factors in the aftermath of restructuring in the early 2000s. Accordingly overall banking system, deposit banks and also bank groups according to their capital ownership are considered. The global uncertainty factors taken into account are financial uncertainty, economic policy uncertainty, trade policy uncertainty and geopolitical risk. The annual data obtained for the period 2002-2023 are analyzed by the Nonlinear Autoregressive Distributed Lag (NARDL) approach. Findings indicate that uncertainty factors have different effects on bank groups.**

***Keywords*:** Financial Markets and Institutions, Turkish Banking Sector, Global Uncertainty Factors, Asymmetric Shocks.

## KÜRESEL BELIRSIZLIKLERDE YÖN BULMAK: REFORM SONRASI DÖNEMDE TÜRK BANKACILIK SEKTÖRÜNÜN FINANSAL SAĞLAMLIĞI

**ÖZET**

**Bu çalışmanın amacı, 2000'li yılların başındaki yeniden yapılandırmanın ardından Türk bankacılık sisteminin küresel belirsizlik faktörlerinden kaynaklanan olumlu ve olumsuz şoklara nasıl tepki verdiğini ortaya koymaktır. Buna göre genel bankacılık sistemi, mevduat bankaları ve ayrıca sermaye sahipliklerine göre banka grupları dikkate alınmıştır. Dikkate alınan küresel belirsizlik faktörleri finansal belirsizlik, ekonomik politika belirsizliği, ticaret politikası belirsizliği ve jeopolitik risktir. 2002-2023 dönemi için elde edilen yıllık veriler Doğrusal Olmayan Otoregresif Dağıtılmış Gecikme (NARDL) yaklaşımıyla analiz edilmiştir. Bulgular, belirsizlik faktörlerinin banka grupları üzerinde farklı etkilere sahip olduğunu göstermektedir.**

**Anahtar Kelimeler:** Finansal Piyasalar ve Kurumlar, Türk Bankacılık Sektörü, Küresel Belirsizlik Faktörleri, Asimetrik Şoklar.

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**VIII. INTERNATIONAL SYMPOSIUM ON ACCOUNTING AND FINANCE**
**Cohosted by MUFAD and Mudanya University**
**Faculty of Arts and Social Sciences**
**25-26 July 2025- ONLINE**

# WHISTLEBLOWING ON ACCOUNTING PROFESSION: WHAT DO ACCOUNTING PROFESSION INTERNS THINK?[*]

**D. Ali KIZILYALÇIN[**], Bahar GÜRDİN[***]**

## ABSTRACT

**Whistleblowing can be defined as the reporting of illegal/illegitimate information within the company to the relevant parties within or outside the company, who are believed to solve the problems. According to the literature on the subject, whistleblowing is not an easy activity and many factors can have an effect on the intention to whistleblow. In this context, the aim of the study is to investigate the effects of perceived moral intensity, perceived organizational support, perceived behavioral control and professional commitment on the internal and external whistleblowing intentions of accounting professional interns. An online survey was applied to accounting professional interns reached through social media accounts (The study received ethics committee approval from Aydın Adnan Menderes University Social and Human Sciences Research Ethics Committee with the decision dated 25/02/2025 and numbered 21/11). Correlation analyses (Spearman and Pearson) were performed on the data obtained through the survey using the SPSS 29 package program. As a result of the analysis, it was observed that there was a relationship between accounting professional interns' internal whistleblowing and/or external whistleblowing intentions and perceived behavioral control, perceived organizational support, perceived moral intensity and professional commitment. Accordingly, a positive, significant but weak relationship was found between perceived behavioral control and internal whistleblowing intention, and a negative, weak but significant relationship between external whistleblowing intention; a positive, significant but weak relationship between perceived moral intensity and internal whistleblowing intention and a positive, significant but weak relationship between external whistleblowing intention; a positive, significant but weak relationship between perceived organizational support and internal whistleblowing intention and a positive, significant but weak relationship between external whistleblowing intention; and finally, a positive, significant but weak relationship between professional commitment and internal and external whistleblowing intention.**

**Keywords:** Whistleblowing Intention(S), Perceived Behavioral Control, Perceived Organizational Support, Perceived Moral Intensity, Professional Commitment

[*] The survey study in the paper was approved as ethically appropriate by the decision of Aydın Adnan Menderes University Social and Human Sciences Research Ethics Committee dated 25/02/2025 and numbered 21/11.

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# MUHASEBE MESLEĞİNDE İHBARCILIK: MUHASEBE MESLEK STAJYERLERİ NE DÜŞÜNÜYOR?

## ÖZET

**İhbarcılık, işletme içindeki yasadışı/gayrimeşru bilgilerin ilgililer tarafından sorunları çözeceğine inanılan işletme içindeki ya da işletme dışındaki ilgililere bildirilmesi olarak ifade edilebilir. Konu hakkındaki literatüre göre ihbarcılık kolay bir faaliyet değildir ve ihbarda bulunma niyeti üzerinde pek çok faktör etkili olabilmektedir. Bu bağlamda çalışmanın amacı, muhasebe meslek stajyerlerinin iç ve dış ihbarda bulunma niyetleri üzerinde algılanan ahlaki yoğunluk, algılanan örgütsel destek, algılanan davranışsal kontrol ve mesleki bağlılığın etkisinin araştırılmasıdır. Sosyal medya hesapları aracılığıyla ulaşılan muhasebe meslek stajyerlerine çevrimiçi anket uygulanmıştır (çalışma için Aydın Adnan Menderes Üniversitesi Sosyal ve Beşeri Bilimler Araştırmaları Etik Kurulu'nun. SPSS 29 paket programı kullanılarak anket yoluyla ulaşılan verilerin korelasyon analizleri (Spearman ve Pearson) gerçekleştirilmiştir. Analiz sonucunda genel olarak muhasebe stajyerlerinin, iç ihbar ve/veya dış ihbar niyetleri ile algılanan davranışsal kontrol, algılanan örgütsel destek, algılanan ahlaki yoğunluk ve mesleki bağlılıkları arasında bir ilişki olduğu görülmüştür. Buna göre; algılanan davranışsal kontrol ile içsel ihbarcılık niyeti arasında pozitif, anlamlı ama zayıf bir ilişki, dışsal ihbarcılık niyeti arasında negatif, zayıf ancak anlamlı bir ilişki; algılanan ahlaki yoğunluk ile içsel ihbarcılık niyeti arasında pozitif, anlamlı ancak zayıf bir ilişki, dışsal ihbarcılık niyeti arasında pozitif, anlamlı ancak zayıf bir ilişki; algılanan örgütsel destek ile içsel ihbarcılık niyeti arasında pozitif, anlamlı ancak zayıf bir ilişki, dışsal ihbarcılık niyeti arasında pozitif, anlamlı ancak zayıf bir ilişki ve son olarak mesleki bağlılık ile içsel ve dışsal ihbarcılık niyeti arasında pozitif, anlamlı ancak zayıf bir ilişki bulunmuştur.**

**Anahtar Kelimeler:** İhbar Niyet(leri), Algılanan Davranışsal Kontrol, Algılanan Örgütsel Destek, Algılanan Ahlaki Yoğunluk, Mesleki Bağlılık

# THE ROLE OF INTERNAL CONTROL IN CORPORATE SUSTAINABILITY PERFORMANCE: AN EMPIRICAL STUDY ON INDUSTRIAL ENTERPRISES

**Feyza Dereköy*, İpek Yaylalı**, Esra Baytören*****

**ABSTRACT**

**The aim of this study is to determine whether there is a significant relationship between the effectiveness of internal control systems in companies and their sustainability performance. In the first stage of the study, a survey developed by Özbirecikli et al. (2015) was utilized to measure the effectiveness of internal control systems of 14 industrial companies operating in the Gebze Industrial Zone and engaged in sustainability reporting. Based on the survey results, internal control effectiveness scores were determined for each company. Subsequently, in order to assess the companies' sustainability performance across economic, environmental, and social dimensions, performance indicators obtained from their sustainability reports were analyzed using the Entropy-Based TOPSIS method. Finally, the internal control scores and sustainability performance scores of the companies were compared using the Spearman Rank Correlation method. As a result, a strong positive correlation was identified between the effectiveness of companies' internal control systems and their sustainability performance.**

**Keywords:** Internal Control, Sustainability Performance, Entropy-Based TOPSIS Method, Spearman Rank Correlation Method.

## KURUMSAL SÜRDÜRÜLEBİLİRLİK PERFORMANSINDA İÇ KONTROLÜN ROLÜ: SANAYİ İŞLETMELERİ ÜZERİNE AMPİRİK BİR ÇALIŞMA

**ÖZET**

**Bu çalışmanın amacı, şirketlerin sahip oldukları iç kontrol sistemlerinin etkinliği ile sürdürülebilirlik performansları arasında anlamlı bir ilişkinin olup olmadığının ortaya konmasıdır. Çalışmada ilk olarak, Gebze Sanayi Bölgesinde faaliyet gösteren ve sürdürülebilirlik raporlaması yapan 14 sanayi şirketinin iç kontrol sistemlerinin etkinliğini ölçmek amacıyla, Özbirecikli vd. (2015) tarafından geliştirilmiş olan anket kullanılmıştır. Anket sonuçlarına göre şirketlerin iç kontrol etkinlik skorları belirlenmiştir. Çalışmada daha sonra, şirketlerin ekonomik, çevresel ve sosyal boyutlardan oluşan sürdürülebilirlik performanslarının tespit edilmesi için, sürdürülebilirlik raporlarından elde edilen performans göstergeleri Entropi Tabanlı TOPSİS yöntemi ile analiz edilmiştir. Son olarak şirketlerin iç kontrol skorları ile sürdürülebilirlik performans puanları, Spearman Sıra Korelasyonu yöntemi ile karşılaştırılmıştır. Sonuç olarak, şirketlerin iç kontrol etkinlikleri ile sürdürülebilirlik performansları arasında güçlü pozitif yönde bir korelasyon olduğu tespit edilmiştir.**

**Anahtar Kelimeler:** İç Kontrol, Sürdürülebilirlik Performansı, Entropi Tabalı Topsis Yöntemi, Spearman Sıra Korelasyonu Yöntemi.

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## 1. INTRODUCTION

With the rise of global issues, the concept of sustainability has become a priority topic worldwide (Ng and Tavitiyaman, 2020: 5). Sustainability refers to meeting the needs of future generations in terms of benefiting from existing resources (Kazemi et al., 2023:2) and can be defined as a business model that ensures the continuity of assets by seizing opportunities and managing risks arising from environmental, social, and economic developments (Camilleri et al., 2023: 4485

From a business perspective, the concept of sustainability is often referred to as “corporate sustainability” (Dyllick and Hockerts, 2002:133). Corporate sustainability is defined as the development of strategies by companies to meet current needs while also protecting and enhancing the natural and human resources required in the future (Roca and Searcy, 2012:103). This understanding shapes itself around the necessity for companies to fulfill their economic, environmental, and social responsibilities in a holistic manner (Hillman and Keim, 2001:127; Kurnaz and Kestane, 2016: 280). Corporate sustainability requires companies not only to focus on economic performance but also to incorporate environmental and social performance into their operations.

Sustainability performance not only enhances the economic efficiency of businesses but also supports them in fulfilling their environmental and social responsibilities (https://G4-Sustainability-Reporting-Guidelines-Implementation-Manual-GRI-2013.pdf, 2013). Therefore, improving sustainability performance is crucial for businesses to achieve long-term success (http://www.controlsframework.net/icif/principles.php, 2013). So, Internal control systems play an important role in managing sustainability performance.

Internal control is a process carried out by managers and all personnel to provide reasonable assurance regarding the achievement of the organization’s objectives (Saltık, 2007: 5). Internal control systems are a set of policies and procedures implemented to safeguard a company’s assets, ensure the accuracy of financial information, enhance operational efficiency, and ensure compliance with legal regulations. Internal control has become one of the most important tool for companies in order to improve their managerial performance (Kim, 2023: 1; Huang and Huang, 2020: 2; Tan et al., 2020: 13; Myšková annd Hájek, 2019: 279). Especially in today’s environment, where corporate governance principles have gained strength, internal control systems have become a strategic tool for companies (http://www.controlsframework.net/icif/principles.php, 2013) increasing managerial accountability and building stakeholder trust (Kaplan and Mikes, 2016: 20).

An effective internal control structure plays a critical role in the processes of determining, implementing, and monitoring sustainability goals. Improving sustainability performance is crucial for businesses to maintain long-term success. At this point, internal control systems are an effective factor in helping companies achieve their sustainability goals (http://www.controlsframework.net/icif/principles.php, 2013).

This study aims to examine the relationship between companies’ internal control capacities and their sustainability performance. For this purpose, a previously developed questionnaire was used to assess whether the companies included in the study possess an effective internal control system. Based on the results, internal control effectiveness scores were determined. Then, to assess sustainability performance, companies’ 2023 sustainability reports were analyzed, and their sustainability performance scores and rankings were calculated using the Entropy-Based TOPSIS Method. Finally, the correlation between internal control scores and sustainability performance scores was evaluated using the Spearman Rank Correlation method to determine whether a significant relationship exists between the two.

## 2. LITERATURE

Measuring corporate sustainability performance at the firm level has garnered significant attention in academic literature, particularly over the past two decades (Goyal et al., 2013: 362), with numerous studies published both nationally and internationally. Likewise, following a series of high-profile accounting scandals in 2002, internal control systems became one of the most crucial tools for businesses and have since been the subject of extensive academic research. On the other hand, while there are numerous national and international studies addressing sustainability performance and internal control individually, studies focusing on the relationship between them are limited and relatively recent. However, no study has been found in national literature examining the relationship between internal control system and sustainability performance.

Moffitt et al. (2023), studied the relationship between corporate environmental, social, and governance (ESG) performance and internal control environment, finding a positive relationship between ESG scores and the strength of the internal control environment. Boulhaga et al. (2023), explored how internal control weaknesses among publicly traded companies in France between 2012 and 2018 affect the relationship between ESG ratings and company performance. Their findings indicated that internal control weaknesses negatively and significantly impacted the relationship between ESG ratings and corporate performance. Yao et al. (2024), conducted a study analyzing how disclosures of material internal control deficiency corrections among publicly traded companies in China between 2012 and 2021 affect ESG performance. Their findings revealed that firms that disclosed such corrections exhibited higher ESG performance, driven by reduced financial risk.

One of the studies that addressed the impact of ESG performance on internal control effectiveness (ICE) was conducted by Jizi and Thomas (2025), using data from companies in the Financial Times Stock Exchange (FTSE) 350 Index between 2010 and 2018. Their study found a linear relationship between internal control quality and ESG performance, suggesting that ESG disclosures could serve as indicators for evaluating a company's internal control quality. Another study by Wang and Guo (2025), using data from companies listed on the Chinese Stock Exchange between 2015 and 2023, concluded that ESG scores significantly improved internal control effectiveness primarily through information risk disclosure. However, financial risk disclosure had no significant effect. The study also found that the positive relationship between ESG and ICE was more pronounced in non-public enterprises.

## 3. METHODOLOGY

### 3.1. Research Objective and Research Questions

Sustainability is directly associated with companies’ performance in the areas of “environmental,” “social,” and “governance” (ESG) (Shakil, 2021:1). Corporate sustainability performance refers to a company's ability to create value for stakeholders by preserving ecological balance, contributing to social welfare, and adhering to effective governance principles (Ahmad et al., 2023: 2965).

On the other hand, the internal control system plays a critical role in managing sustainability performance and achieving sustainability goals (http://www.controlsframework.net/icif/principles.php, 2013). A strong internal control system enables businesses to respond strategically to opportunities and threats, maintain compliance with legal, regulatory, and ethical standards, and protect their reputations—thus improving ESG performance and enhancing sustainability (Oyewo, 2023: 3). As a result, internal control capacity is considered as a key factor in improving ESG performance and achieving ESG integration (Harasheh and Provasi, 2022: 384-385).

In this context, the objective of this research is to evaluate the relationship between internal control system—which is regarded as fundamental for a company in achieving its sustainability goals—and sustainability performance. Based on this objective, the following research questions have been formulated:

1.Does having a strong internal control system improve companies’ sustainability performance?
2.Which of the ESG (environmental, social, and governance) dimensions is most affected by the effectiveness of the internal control system?

### 3.2. Research Sample

The research sample was selected using convenience sampling and consists of 24 industrial companies operating in the Gebze Organized Industrial Zone that also publish sustainability reports. Convenience sampling is a non-probability sampling method that allows for rapid data collection by prioritizing ease of access over targeting a specific segment of the population. The simplicity of this method enables researchers to obtain a sample without extensive planning (Lohr, 2022: 730).

### 3.3. Research Method

First of all, in order to determine whether the companies included in the study had an effective internal control system, a survey developed by Özbirecikli et al. (2015) and previously used in another study was applied. The survey includes 45 questions related to the companies’ demographic information as well as the five key components of internal control systems: control environment, risk assessment, control activities, information and communication, and monitoring activities. The survey responses were structured as “Yes” or “No” choices, with “Yes” receiving 1 point and “No” receiving 0 points. The total score from the survey represents each company’s internal control effectiveness score.

Afterwards, in order to determine the sustainability performance (ESG performance) of the companies in the study, a data set was created based on economic, environmental, and social performance indicators that had been used in previous studies. Table 1 shows the performance indicators.

**Table 1.** Sustainability Performance (ESG Performance) Indicators

| Dimentions | Indicators | References |
|---|---|---|
| Enviromantal | Greenhouse Gas Emission | Korga and Arslanoğlu (2024); Arsu and Arsu (2023); Korga and Dirik (2023); Özevin (2022); Aksoylu and Taşdemir (2020); Yalçın and Karakaş (2019); Ersoy (2018); Acar et al (2015); Medel-González et al (2015); Öztel et al (2012); Sign (2007) |
| | Water Consumption | Korga and Arslanoğlu (2024); Arsu and Arsu (2023); Korga and Dirik (2023); Özevin (2022); Yalçın and Karakaş (2019); Acar et al (2015); Medel-González et al (2015); Öztel et al (2012); Erol et al (2011); Sign (2007) |
| | Energy Consumption | Korga and Arslanoğlu (2024); Arsu and Arsu (2023); Özevin (2022); Ersoy (2018); Acar et al (2015); Medel-González et al (2015); Öztel et al (2012); Erol et al (2011); Sign (2007) |
| | Recycled Waste | Arsu and Arsu (2023); Yalçın and Karakaş (2019); Öztel et al (2012); Sign (2007) |
| | Amount of Waste | Korga and Arslanoğlu (2024); Korga and Dirik (2023); Özevin (2022); Aksoylu and Taşdemir (2020); Ersoy (2018); Diaz-Balterio et al (2011) |
| Social | Female Employee Rate | Korga and Arslanoğlu (2024); Arsu and Arsu (2023); Korga and Dirik (2023); Aksoylu and Taşdemir (2020); Yalçın and Karakaş (2019); Öztel et al (2012) |
| | Training Hours per Employee | Korga and Arslanoğlu (2024); Arsu and Arsu (2023); Korga and Dirik (2023); Özevin (2022); Aksoylu and Taşdemir (2020); Yalçın and Karakaş (2019); Medel-González et al (2015); Lee and Saen (2012); Öztel et al (2012); Erol et al (2011) |
| | Employee Turnover Rate | Arsu and Arsu (2023); Korga and Dirik (2023); Yalçın and Karakaş (2019); Ersoy (2018); Erol et al (2011) |

| | | |
|---|---|---|
| | Female Executive Ratio | Korga and Arslanoğlu (2024); Korga and Dirik (2023); Öztel et al (2012) |
| Economic | Sales Revenue | Korga and Arslanoğlu (2024); Özevin (2022); Yalçın and Karakaş (2019); Ersoy (2018); Erol et al (2011) |
| | Return on Assets | Arsu and Arsu (2023); Özevin (2022); Aksoylu and Taşdemir (2020); Yalçın and Karakaş (2019) |
| | Return on Equity | Arsu and Arsu (2023); Özevin (2022); Yalçın and Karakaş (2019) |
| | Net Profit Margin | Özevin (2022); Aksoylu and Taşdemir (2020) |

The EGS performance data were obtained by examining the companies' 2023 sustainability reports. Sustainability performance scores and rankings were then calculated using the Entropy-Based TOPSIS (Technique for Order Preference by Similarity to Ideal Solution) method. The Entropy Method was used to determine the weights of the performance indicators in the reports, and the TOPSIS Method was used to calculate rankings based on these weights. This approach allowed for sustainability report rankings to reflect the importance levels of the performance criteria.

Finally, companies' internal control scores and sustainability performance scores were compared using the Spearman Rank Correlation to determine whether a statistically significant relationship exists. The Spearman Rank Correlation was selected because it is a powerful method for analyzing the correlation between ranked data (Temizel and Bayçelebi, 2016: 162). In this way, the study aimed to identify the correlation between internal control systems and sustainability performance in order to reveal the impact of internal control components on sustainability.

## 4. FINDINGS

The study first aimed to examine the impact of a strong internal control system on the sustainability performance of companies. Initially, the rankings of the companies from best to worst were obtained according to their sustainability report performance scores using Entropy-based TOPSIS method. Then, the rankings of the same companies were obtained according to the internal control system survey results, and the relationship between both rankings was observed with Spearman Rank Correlation. Table 2 shows the rankings of the companies.

**Table 2.** Company Rankings for Sustainability Performance and Internal Control System

| Companies | Sustainability Performance Ranking | Internal Control System Ranking |
|---|---|---|
| **A** | 1 | 3 |
| **B** | 14 | 14 |
| **C** | 12 | 13 |
| **D** | 9 | 9 |
| **E** | 10 | 3 |
| **F** | 11 | 9 |
| **G** | 8 | 7 |
| **H** | 3 | 3 |
| **I** | 6 | 9 |
| **J** | 2 | 1 |
| **K** | 13 | 11,5 |
| **L** | 7 | 5,5 |
| **M** | 4 | 11,5 |
| **N** | 5 | 5,5 |

The Spearman Rank Correlation value calculated using the rankings of the companies was obtained as 0.7142. The Spearman Rank Correlation takes values between 0-1, and the values of 0.70 and above represent a strong positive relationship.

Another purpose of the study was defined as determining which of the environmental, social and governance dimensions of sustainability performance report is affected more by the effectiveness of the internal control system. For this purpose, the Entropy-based TOPSIS method and the Spearman Rank Correlation Method were repeated for each dimension. The company rankings obtained from the results of the Entropy-based TOPSIS method applied for the criteria in the environmental, social and governance dimensions of the sustainability report are given in Table 3. Since the internal control system rankings of the companies are the same as Table 2, they are not repeated in Table 3.

**Table 3.** Ranking of Companies by Sustainability Performance Report Dimensions

| | Sustainability Performance Rankings for | | |
|---|---|---|---|
| **Companies** | **Environmental Dimension** | **Social Dimension** | **Governance Dimension** |
| **A** | 2 | 8 | 7 |
| **B** | 14 | 13 | 12 |
| **C** | 12 | 11 | 8 |
| **D** | 5 | 14 | 13 |
| **E** | 9 | 12 | 6 |
| **F** | 10 | 3 | 14 |
| **G** | 8 | 9 | 10 |
| **H** | 4 | 10 | 11 |
| **I** | 6 | 6 | 9 |
| **J** | 3 | 5 | 1 |
| **K** | 13 | 7 | 4 |
| **L** | 11 | 2 | 3 |
| **M** | 1 | 4 | 2 |
| **N** | 7 | 1 | 5 |

The Spearman Rank Correlation value obtained by using rankings of the companies' internal control system and environmental dimension of the sustainability performance report was obtained as 0.5274. The same correlation coefficient was obtained as 0.2109 for social dimension; and 0.2945 for the governance dimension. It was seen that the highest correlation coefficient belonged to the environmental dimension, and it was concluded that the internal control system effectiveness affected the environmental dimension of the sustainability performance report the most. According to the Spearman Rank Correlation values, the governance dimension was in the second place, while the lowest correlation coefficient belonged to the social dimension, and it was concluded that the internal control system effectiveness affected the governance dimension of the sustainability performance report the least.

## 5. CONCLUSION AND SUGGESTION

In this study, the aim is to examine the relationship between the internal control system which is considered a significant factor in managing corporate sustainability performance, and sustainability performance itself. For this purpose, the study was designed as a relational/correlational research.

Initially, a survey developed by Özbirecikli et al. (2015) was administered to assess the effectiveness of internal control systems of the companies included in the sample. The responses were scored with "yes" answers receiving 1 point and "no" answers receiving 0 points. In this way, an internal control effectiveness score was calculated for each company. Higher scores indicate the presence of a more effective internal control system. Subsequently, performance indicators were determined by referring to previous studies in the literature in order to measure the companies' sustainability performance across economic, environmental and social dimensions. Data related to these indicators were obtained by examining the companies' sustainability reports. Using this dataset, the sustainability performance scores and rankings of the companies were determined through the Entropy-Based TOPSIS method.

Then, the companies' internal control effectiveness scores and sustainability performance scores were compared and analyzed using the Spearman Rank Correlation, both in general and across each dimension of sustainability performance. The Spearman Rank Correlation coefficient of 0.7142 was calculated based on the companies' rankings. Given that this coefficient ranges from 0 to 1, a value of 0.70 or higher indicates a strong positive correlation.

This result indicates a positive relationship between internal control effectiveness and sustainability performance, as stated in the literature (Moffit et al., 2023; Jizi and Thomas, 2025; Wang and Guo, 2025). It demonstrates that companies with a strong internal control syste, improve their sustainability performance (Harasheh and Provasi, 2022; Boulhaga et al., 2023; Oyewo, 2023; He et al., 2024). In addition, according to the research results, when the Spearman Rank Correlation values of the rankings made according to the internal control effectiveness scores of the companies and the three dimensions of the sustainability performans were examined, it was seen that all values represented a positive relationship. Among the three dimensions of sustainability performance, the environmental dimension exhibited the strongest correlation, indicating that the effectiveness of internal control systems most prominently influences environmental sustainability disclosures.

Although the study sample was initially defined as 24 industrial companies operating in the Gebze Organized Industrial Zone and publishing sustainability reports, responses were obtained from only 14 companies. Therefore, the limited number of participating companies constitutes a limitation in terms of the generalizability of the results. Despite its limitations, this study offers an original contribution by examining the relationship between internal control systems and sustainability performance, it is expected to make a significant contribution to the national literature and serve as a basis for future research. Subsequent studies should consider expanding the sample size and conducting sectoral comparisons.

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**VIII. INTERNATIONAL SYMPOSIUM ON ACCOUNTING AND FINANCE**
**Cohosted by MUFAD and Mudanya University**
**Faculty of Arts and Social Sciences**
**25-26 July 2025- ONLINE**

# THE IMPACT OF BIG FOUR AUDIT FIRMS AND OTHER AUDIT FIRMS ON ACCRUAL QUALITY

**Fatih Coşkun Ertaş*, Beyza Demir****

## ABSTRACT

The rapid globalization of commercial activities has necessitated the efficient functioning of capital markets worldwide. The effective operation of these markets relies heavily on the transparent and reliable reporting of financial statements. One of the indicators reflecting the faithful representation of financial statements is accrual quality. Accrual quality refers to the degree to which accounting accruals accurately reflect future cash flows—in other words, how well they predict those flows. Although various models have been proposed in the literature to measure accrual quality, no universally accepted method has been established. This study employs a hybrid model that combines the foundational approach of Dechow and Dichev (2002) with the enhancements proposed by Francis et al. (2005) and Kothari et al. (2005), which are widely used in the literature. The primary aim of this research is to examine whether the type of audit firm—specifically, international Big Four audit firms (PwC, Deloitte, KPMG, EY) versus other audit firms—has a significant effect on the accrual quality of audited companies. The study analyzes data from 49 manufacturing companies listed on Borsa Istanbul (BIST) over the period 2021–2024. The data were analyzed using panel data methods via STATA 17. In the empirical model, the dependent variable is scaled accrual quality, while the independent variables include the annual change in revenues (scaled_Δrevenue), property, plant, and equipment (scaled_ppe), and return on assets (ROA). The results indicate that ROA has a positive and statistically significant effect on accrual quality across both audit firm groups. Additionally, the annual change in revenues is statistically significant only for firms audited by Big Four firms, suggesting that higher audit quality contributes to more transparent and predictable financial reporting. On the other hand, property, plant, and equipment were found to have no statistically significant impact on accrual quality in either group. Overall, the study finds no statistically significant relationship between audit firm type and accrual quality.

**Keywords:** Accrual quality, Audit firm, Profitability, Property, Plant and Equipment, Return on Assets

## BÜYÜK DÖRT DENETİM FİRMASININ VE DİĞER DENETİM FİRMALARININ TAHAKKUK KALİTESİ ÜZERİNDEKİ ETKİSİ

## ÖZET

**Ticari faaliyetlerin hızla küreselleşmesi, dünya çapında sermaye piyasalarının etkin bir şekilde işlemesini gerekli kılmıştır. Bu piyasaların etkin bir şekilde işlemesi, finansal tabloların şeffaf ve güvenilir bir şekilde raporlanmasına büyük ölçüde bağlıdır. Finansal tabloların sadık bir şekilde sunulmasını yansıtan göstergelerden biri de tahakkuk kalitesidir. Tahakkuk kalitesi, muhasebe tahakkuklarının gelecekteki nakit akışlarını ne kadar doğru bir şekilde yansıttığına, başka bir deyişle, bu akışları ne kadar iyi tahmin ettiğine işaret eder. Literatürde tahakkuk kalitesini ölçmek için çeşitli modeller önerilmiş olsa da, evrensel olarak kabul görmüş bir yöntem**

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**oluşturulmamıştır. Bu çalışma, Dechow ve Dichev'in (2002) temel yaklaşımını, literatürde yaygın olarak kullanılan Francis ve diğerleri (2005) ve Kothari ve diğerleri (2005) tarafından önerilen geliştirmelerle birleştiren bir hibrit model kullanmaktadır. Araştırmanın temel amacı, denetim firmasının türünün—özellikle uluslararası düzeyde faaliyet gösteren Big Four (PwC, Deloitte, KPMG, EY) denetim firmaları ile diğer denetim firmalarının—denetlenen firmaların tahakkuk kalitesi üzerinde anlamlı bir etkisi olup olmadığını incelemektir. Bu kapsamda, Borsa İstanbul'da (BIST) işlem gören 49 imalat sanayi şirketine ait 2021–2024 dönemine ilişkin veriler panel veri analiz yöntemiyle ve STATA 17 programı kullanılarak analiz edilmiştir. Bu araştırmanın temel amacı, denetim firması türünün (özellikle uluslararası Büyük Dörtlü denetim firmaları (PwC, Deloitte, KPMG, EY) ile diğer denetim firmaları arasındaki farkın) denetlenen şirketlerin tahakkuk kalitesi üzerinde önemli bir etkiye sahip olup olmadığını incelemektir. Çalışma, Borsa İstanbul'da (BIST) işlem gören 49 üretim şirketinin 2021-2024 dönemindeki verilerini analiz etmektedir. Veriler, STATA 17 aracılığıyla panel veri yöntemleri kullanılarak analiz edilmiştir. Ampirik modelde, bağımlı değişken ölçekli tahakkuk kalitesi iken, bağımsız değişkenler yıllık gelir değişikliği (scaled_Δrevenue), mülk, tesis ve ekipman (scaled_ppe) ve varlıkların getirisi (ROA)'dır. Sonuçlar, ROA'nın her iki denetim firması grubunda da tahakkuk kalitesi üzerinde pozitif ve istatistiksel olarak anlamlı bir etkiye sahip olduğunu göstermektedir. Ek olarak, gelirdeki yıllık değişiklik yalnızca Büyük Dörtlü firmalar tarafından denetlenen firmalar için istatistiksel olarak anlamlıdır ve bu da daha yüksek denetim kalitesinin daha şeffaf ve öngörülebilir finansal raporlamaya katkıda bulunduğunu göstermektedir. Öte yandan, mülk, tesis ve ekipmanın her iki grupta da tahakkuk kalitesi üzerinde istatistiksel olarak anlamlı bir etkisi olmadığı bulundu. Genel olarak, çalışma denetim firması türü ve tahakkuk kalitesi arasında istatistiksel olarak anlamlı bir ilişki bulamadı.**

**Anahtar Kelimeler**: Tahakkuk kalitesi, Denetim firması, Kârlılık, Maddi Duran Varlıklar, Aktif Karlılığı

## 1. INTRODUCTION

The rapid growth and development of commercial life worldwide have led to the expansion and diversification of enterprises, consequently increasing the demand for reliable financial information. The reliability and fairness of financial information can only be ensured through auditing processes. Accounting is a technical discipline that systematically records, classifies, and reports financial events of a business by collecting relevant information from appropriate sources. A high-quality accounting approach involves collecting financial inputs from reliable sources and reporting them accurately and consistently.

Since financial reports play a crucial role in the decision-making processes of financial statement users, they must reflect the true state of affairs. In other words, financial statements should be reliable and faithfully represent reality. This reliability is assured through auditing. Auditing verifies whether financial statements are accurate and comply with applicable laws and standards. Performing auditing without accounting renders auditing unsupported, while accounting without auditing results in unverifiable information (Erdoğan, 2002:54). Independent auditors are responsible for determining whether a company’s financial statements contain material misstatements due to error or fraud. By identifying such issues, auditors help strengthen the reliability of financial reports.

A timing mismatch often occurs when revenues and expenses do not coincide with their respective collections or payments. For example, expenses incurred to generate future revenues may not occur in the same accounting period. This discrepancy creates a matching problem between revenues and expenses. Since economic transactions are recorded at the time of occurrence rather than when cash is received or paid, errors in timing and matching can arise in the cash flow statements of companies. Accruals are used to correct such timing and matching issues in financial statements (Dechow, 1994:8).

In accounting, accrual refers to recognizing revenues and expenses when they are incurred, regardless of when cash is received or paid. The difference between the recording of financial events and the actual cash movements is addressed through accruals. Accrual quality indicates the degree to which accruals align with future cash flows. Managers may exploit discretionary accruals by taking advantage of gaps in accounting standards to manipulate earnings in their favor rather than representing the company's true financial position. Thus, accrual quality is used as a control mechanism to assess the likelihood that accruals will convert into cash flows in the future. Dechow and Dichev (2002) proposed a model to measure the relationship between accruals and past, current, and future cash flows as a means of determining accrual quality.

## 2. LITERATURE REVIEW

In his study, Durak (2010) aimed to examine whether accrual reliability affects earnings persistence, which is considered one of the key indicators of a firm's financial performance. Applying the Dechow and Dichev (2002) model to data from industrial firms listed on the Istanbul Stock Exchange (ISE) between 1998 and 2007, he tested the relationship between accrual reliability and earnings persistence using panel data analysis. The results revealed that firms with lower accrual reliability exhibited less persistent earnings. Moreover, the study found that cash-based earnings were more persistent than accrual-based earnings.

Ittonen et al. (2013), in one of the prominent studies on accrual quality—an essential indicator of the quality of financial reporting—emphasized that accrual quality is not merely a component reflecting the extent to which accrual-based accounting aligns with future cash flows. Instead, it also reflects audit quality and management's accounting choices. Their study investigated the relationship between the gender composition of audit teams and accrual quality. The findings showed that firms audited by teams with a higher proportion of female auditors had higher accrual quality.

Eyüpgiller and İlseven (2015) explored the relationship between the type of financial reporting and accrual quality. They found that financial statements reported under the mandatory IFRS framework in Turkey exhibited higher accrual quality. The study suggested an indirect relationship between the high quality of accounting standards and improved accrual quality.

One of the studies evaluating earnings persistence—an indicator of the reliability of financial statements—is that of Özkan and Kayalı (2015). They comparatively analyzed cash flows, earnings, and accrual persistence of firms listed on Borsa Istanbul. The results indicated that accrual persistence was lower than that of the other two variables. The researchers argued that this could be attributed to the volatility inherent in accruals. Due to their estimation-based nature, accruals are more prone to risk, highlighting accrual quality as a critical tool in assessing the reliability of financial reports.

Temiz (2018), based on financial data obtained from BIST 100 companies, examined the relationship between accrual quality and earnings persistence. The study concluded that higher accrual quality positively affects earnings persistence. High accrual quality provides financial statement users with more reliable and stable earnings information.

Suadiye (2021) investigated the relationship between accrual-based earnings management and accrual quality. The study found that firms with lower accrual quality engaged in more earnings management practices compared to those with higher accrual quality. The study suggested that accrual quality plays an active role in identifying the extent of earnings management and recommended that accrual quality be considered an independent audit component to enhance the reliability of financial statements.

In their 2020 study, Zor et al. analyzed how the implementation of Turkish Accounting Standards (TAS) and Turkish Financial Reporting Standards (TFRS) affects firms' earnings management practices. The results indicated a noticeable decline in earnings management among firms applying TAS/TFRS, supporting the view that these standards promote fair presentation. Additionally, the study emphasized that earnings management through accruals could compromise the reliability of financial statements and that identifying accrual quality not only reveals estimation errors in accounting but also allows for an evaluation of the effectiveness of financial reporting standards.

## 3. METHODOLOGY

This study investigates the effect of international Big Four audit firms (PwC, Deloitte, KPMG, EY) and other audit firms on accrual quality. The analysis is conducted using data from companies in the Borsa Istanbul (BIST) manufacturing sector. The motivation for focusing on this sector stems from the presence of numerous accrual-related items such as inventory write-downs, asset impairment provisions, severance pay liabilities, depreciation accruals, deferred taxes, and provisions for doubtful receivables.

According to Dechow (1994), managers may use discretionary accruals as a tool for earnings management when audit quality is low. Identifying discretionary accruals within total accruals is often challenging, and the literature presents considerable debate and uncertainty about the methods for such separation (see Guay et al., 1996; Bernard and Skinner, 1996). Researchers argue that due to the opportunistic use of discretionary accruals, these accruals are less likely to translate into future cash flows (Srinidhi & Gul, 2006:2).

To measure accrual quality, this study employs the model proposed by Francis et al. (2005), which extends the widely-used accrual estimation error model introduced by Dechow and Dichev (2002). This model assesses how closely accruals align with actual future cash flows, effectively capturing the reliability of accrual-based accounting information.

The Dechow and Dichev (2002) model is expressed as:

$$TCA_t = a_0 + a_1 CFO_{t-1} + a_2 CFO_t + a_3 CFO_{t+1} + \varepsilon_t$$

Where:

- TCA: Total current accruals in year t, calculated as:

  $TCA = \Delta CA - \Delta Cash - \Delta STInv - \Delta CL + \Delta STDebt$
  - ➢ ΔCA: Change in current assets
  - ➢ ΔCash: Change in cash
  - ➢ ΔSTInv: Change in short-term investments
  - ➢ ΔCL: Change in current liabilities
  - ➢ ΔSTDebt: Change in short-term debt
- CFOt−1, CFOt, CFOt+1: Cash flows from operations for the previous, current, and subsequent years, respectively
- εt: The residual term representing the portion of accruals not explained by cash flows; the standard deviation of these residuals is used to measure accrual quality. A higher standard deviation indicates lower accrual quality.

### 3.1. Extended Model By Francis Et Al. (2005)

To enhance the explanatory power of the Dechow and Dichev (2002) model, Francis et al. (2005) introduced additional variables, resulting in an extended accrual quality model:

$$TCA_t = a_0 + a_1CFO_{t-1} + a_2CFO_t + a_3CFO_{t+1} + a_4\Delta Revenue_t + a_5PPE_t + \varepsilon_t$$

Where:

- ΔRevenuet: Annual change in revenue in year t.
- PPEt: Property, plant, and equipment in year t. This variable is included because firms with more fixed assets typically report higher depreciation, which can influence the level of accruals.
- εt: The residual term of the model. Accrual quality is measured using the absolute value of this residual. The smaller the absolute value, the higher the accrual quality.

Since firms vary in size, all variables are scaled by average total assets to ensure comparability.

### 3.2. Second Stage Regression Analysis

To test whether the type of audit firm (Big Four vs. non-Big Four) affects accrual quality, a second regression model was established using the absolute residuals from the first model as the dependent variable.

- Dependent variable: Accrual quality indicator (absolute value of the residual).
- Independent variable: Audit firm type (1 = Big Four, 0 = Other audit firms).
- Control variables: Firm size, leverage ratio, and profitability (ROA).

The model anticipates that firms audited by Big Four firms will exhibit higher accrual quality due to greater audit effort and scrutiny.

### 3.3. Sample Selection and Data

This study investigates the factors that determine accruals (working capital accruals, revenue changes, property, plant, and equipment, and return on assets) to assess accrual quality. The effect of audit firm type on accrual quality was examined using panel data analysis in STATA 17. A fixed effects model was employed, appropriate for the data structure.

The dataset consists of 49 firms operating in the BIST manufacturing sector, covering four years, totaling 196 firm-year observations.

The dependent variable in the research model is working capital accruals, while the independent variables include audit firm type, return on assets, annual change in revenue, and property, plant, and equipment. Firms were categorized based on audit firm type, and fixed effects models were estimated separately for each group.

In addition to the Dechow and Dichev (2002) model, the variables Δrevenue and PPE proposed by Francis et al. (2005) were incorporated. Moreover, to account for performance effects, ROA—recommended by Kothari et al. (2005)—was added as a control variable. A simplified and operational version of the model widely used in the literature was employed as follows:

$$scaled\_tca_{i,t} = \alpha_i + \beta_1.scaled\_\Delta revenue_{i,t} + \beta_2.scaled\_ppe_{i,t} + \beta_3.roa_{i,t} + \varepsilon_{i,t}$$

Where:

- scaled_tca: Scaled working capital accruals
- scaled_Δrevenue: Scaled annual change in revenue
- scaled_ppe: Scaled property, plant, and equipment
- roa: Return on assets

## 4. FINDINGS

As a result of the analysis conducted in the study, the ROA (Return on Assets) variable was found to be statistically significant and positive in both groups: for the Big Four audit firms ($\beta = 0.822$, $p < 0.001$) and for the non-Big Four audit firms ($\beta = 1.034$, $p < 0.01$). This indicates that firms with higher profitability also exhibit higher accrual quality. It can be inferred that these firms generate their profits primarily through accrual-based accounting.

The variable *Scaled_Δrevenue* (annual change in revenues) was significant and positive for firms audited by the Big Four ($\beta = 0.000201$, $p < 0.05$), while it was statistically insignificant for the non-Big Four group. This suggests that the revenue-accrual relationship is more transparent and predictable in firms audited by the Big Four compared to those audited by other firms.

The *Scaled_ppe* (property, plant, and equipment) variable was found to be statistically insignificant in both groups. This implies that the impact of tangible fixed assets on accrual quality is limited.

## 5. CONCLUSION

According to the findings obtained in this study, accrual quality is positively influenced by a firm's return on assets (ROA). Firms with higher profitability appear to exhibit more predictable accrual practices in forecasting future cash flows. On the other hand, the change in sales was found to be statistically significant only for firms audited by Big Four audit firms, suggesting a stronger and more transparent revenue-accrual relationship in those firms.

Conversely, the insignificance of the property, plant, and equipment (PPE) variable in both audit firm groups indicates that PPE has limited explanatory power for accrual quality. It can be inferred that this item is relatively weak as an indicator of accrual quality.

A limitation of the study is that it focuses solely on firms in the manufacturing sector. Future research could employ alternative models to measure accrual quality and incorporate additional explanatory variables to build a more robust and comprehensive model.

The overall findings suggest that there is no consistent or statistically significant relationship between the type of audit firm (Big Four vs. non-Big Four) and the accrual quality of audited firms. In other words, whether a firm is audited by one of the Big Four audit firms does not significantly affect the error term in estimating future cash flows from accruals. Therefore, the type of audit firm alone does not appear to be a sufficient determinant of audit quality. Other factors, such as the effectiveness of internal control systems and the accounting policies implemented by management, may also play a role. In conclusion, the type of audit firm, by itself, is not a decisive factor in determining accrual quality.

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# CONVERGING OR DIVERGING? A COMPARATIVE REVIEW OF ETHICS EDUCATION REQUIREMENTS IN PROFESSIONAL ACCOUNTING BODIES

**Zeynep Yaroğlu**[*]

## ABSTRACT

**The aim of this study is to comparatively examine the extent to which professional accountancy organizations comply with international standards—particularly IES 4 and IES 7—that seek to strengthen ethical integrity within the accounting profession. The methodology involves a qualitative content analysis of ethics education and continuing professional development (CPD) documents from fourteen professional bodies and oversight authority across different countries, using a structured coding framework. The findings reveal broad convergence in the mandatory inclusion of ethics-related CPD hours and general references to the IESBA Code of Ethics. However, significant divergences remain in areas such as the integration of ethics into initial professional development, the use of assessment mechanisms, and the incorporation of reflective learning tools. These results suggest that beyond formal compliance, a more holistic and pedagogically robust approach to ethics education is necessary to ensure meaningful behavioral development and professional ethical competence.**

**Keywords:** Ethics Education, Continuing Professional Development, International Education Standards, The IESBA Code of Ethics, IFAC.

## BİRLEŞİYOR MU, AYRIŞIYOR MU? MESLEKİ MUHASEBE KURUMLARINDA ETİK EĞİTİMİ GEREKLİLİKLERİNİN KARŞILAŞTIRMALI BİR İNCELEMESİ

## ÖZET

**Bu çalışmanın amacı, muhasebe mesleğinde etik bütünlüğü güçlendirmeyi hedefleyen uluslararası standartlara (özellikle IES 4 ve IES 7) meslek örgütlerinin ve düzenleyici kurulların ne ölçüde uyum sağladığını karşılaştırmalı olarak incelemektir. Yöntem olarak, ondört farklı ülkedeki meslek örgütlerine ve gözetim otoritelerine ait etik eğitimi ve sürekli mesleki gelişim (CPD) belgeleri nitel içerik analizi yöntemiyle kodlanmış, yapılandırılmış bir kodlama kitabı çerçevesinde değerlendirilmiştir. Çalışmanın bulguları, etik eğitimin CPD kapsamında belirli saatlerle zorunlu hale getirildiği ve IESBA Etik Kuralları'na genel bir atıf yapıldığı konusunda geniş bir yakınsama olduğunu; ancak etik eğitimin meslek öncesi aşamalarda bütünleştirilmesi, değerlendirme mekanizmaları ve yansıtıcı öğrenme araçlarının kullanımı açısından ciddi farklılıklar bulunduğunu ortaya koymaktadır. Bu durum, yapısal uyumun ötesinde, pedagojik derinlik ve davranışsal gelişim açısından daha bütüncül ve tutarlı bir etik eğitimi yaklaşımına ihtiyaç olduğunu göstermektedir.**

**Anahtar kelimeler:** Etik Eğitimi, Sürekli Mesleki Gelişim, Uluslararası Eğitim Standartları, IESBA Etik Kuralları, IFAC.

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## 1. INTRODUCTION

The accounting profession has a critical impact on public interest. After a series of corporate failures and frauds and rising demands for public accountability, the ethical competence of professional accountants has emerged as a cornerstone of public trust in the accounting profession. Historically, ethics was a marginal component of accounting education. Early implementations often took the form of disconnected, standalone courses, lacking pedagogical coherence or integration into technical curricula (Dellaportas, 2006: 400).

Following related regulatory responses, the International Federation of Accountants (IFAC) approved a range of reforms in order to reincrease confidence in the accounting and auditing profession. A part of reforms related to ethics and education are developing and issuing the International Code of Ethics for Professional Accountants (the IESBA[3] Code), and the International Education Standards (IESs). The IESBA Codes are principle-based standards of professional ethics for professional accountants (the IESBA, https://www.ethicsboard.org/about-iesba), and the IESs aim to promote quality and consistency in accountancy education around the globe by mandating for the IFAC member bodies. The IESs, particularly IES 4 and IES 7, are designed to ensure that professional accountants both acquire and maintain the ethical competence necessary to uphold the five fundamental principles of ethics as outlined in the IESBA Code of Ethics (IFAC, 2025: 4). The revised versions of IES 4 *Initial Professional Development: Professional Values, Ethics and Attitudes,* and IES 7 *Continuing Professional Development* require the integration of ethics in both initial professional development (IPD) and continuing professional development (CPD). IES 4 requires applicant professional accountants to develop ethical competence through formal assessments and structured reflective learning that address professional skepticism, judgment, and public interest. Complementing this, IES 7, in a broader scope, requires oversight authorities and PAOs to ensure professional accountants maintain ethical competence through ongoing Continuing Professional Development (CPD). Member bodies are mandated to promote access to ethics-related CPD opportunities, adopt robust measurement systems (input-based, output-based, or hybrid), and enforce compliance through monitoring and sanctions.

According to the 2024 IFAC Global Adoption Snapshot, 38% of IFAC member jurisdictions have fully adopted the IESs, 60% have partially adopted them, and only 1% have not adopted them at all — reflecting steady progress compared to 2019, when just 19% had achieved full adoption. However, this widespread adoption does not necessarily translate into uniform implementation. Variations in curriculum content, assessment strategies, instructor qualifications, and pedagogical integration reflect a fragmented global landscape. These divergences in curriculum design, depth of ethical instruction, and enforcement mechanisms across jurisdictions raise questions about the global comparability of ethical competencies among professional accountants. The IFAC Self-Assessment Report (2021) also signals those concerns by providing a tool for self-assessment of oversight authorities and PAOs to achieve a consistent application of IES 4 principles, particularly regarding assessment and instructor qualifications.

Given the profession’s transnational mobility and dependence on ethical trust, such variation challenges the global legitimacy of accounting qualifications. It also suggests a potential disconnect between the formal adoption of international standards and their actual integration into the professional learning ecosystem, which forms a gap that gives rise to the research question.

In response to regulatory reforms, more comprehensive models have emerged. Notably, the Ethics Education Framework (EEF) by Dellaportas et al. (2011: 68-69) incorporates Rest’s Four-Component Model, proposing a staged approach to cultivating moral sensitivity, judgment, motivation, and character. The paper emphasizes the importance of continuing professional development to achieve

[3] The International Ethics Standards Board for Accountants

ethical behaviour (Dellaportas et al., 2011: 71). Despite theoretical consensus, the implementation of such models remains inconsistent. For example, West and Buckby (2020: 71-72) found that although Australian and New Zealand accounting programs address moral reasoning, moral motivation and ethical behaviour are often overlooked, particularly in postgraduate and CPD phases.

Since no study shows the current state of ethics education for accounting and auditing professionals, this study investigates whether professional accounting organizations (PAOs) worldwide are aligning with these international frameworks or diverging in their approaches to ethics education.

This study employs a comparative content analysis of ethics education frameworks from major oversight authorities and accounting bodies, and benchmarks them against the expectations of IES 4 and IES 7. The findings reveal both convergence, notably in the formal adoption of the IESBA Code, and divergence, particularly in the depth of assessment mechanisms and the scope of CPD ethics coverage.

By illuminating these patterns, the study contributes to debates on the global harmonization of ethics education. It provides a systematic comparative mapping that demonstrates that ethics education in accounting is converging in form but diverging in function—an illusion of harmonization that masks systemic fragmentation.

## 2. METHODOLOGY

This study adopts a qualitative content analysis (QCA) approach to examine and compare the ethical education and continuing professional development (CPD) requirements of 14 professional accounting bodies across multiple jurisdictions. The objective is to assess the degree to which these bodies align with internationally recognized benchmarks, particularly the IES 4 (Revised 2025) and IES 7 (Revised 2020), and how they reflect the ethical competencies expected under the IESBA Code of Ethics.

Following the principles outlined by Schreier (2012: 80-106) and Kuckartz & Rädiker (2023: 101-122), the study employs a structuring content analysis design, combining deductive category development based on the IESs, the IFAC Self-Assessment Tool, and the IESBA Code, with inductive refinement from the national and professional accounting body documents reviewed.

Structuring content analysis approach is considered appropriate for categorization and evaluation of formal, policy documents such as standards, ethics education guidelines, and member compliance requirements published by professional accountancy organizations (PAOs) and oversight authorities.

The study includes 14 jurisdictions selected for their regional diversity and regulatory significance. The professional bodies included are:

- KGK (Turkey)
- Texas TSBPA, NYS Public Accountancy Board, California Board of Accountancy (the USA)
- ICAEW, ACCA (the UK)
- IDW/ WPK (Germany)
- OROC (Portugal)
- CPA Canada
- CPA Australia, CA ANZ (Australia/New Zealand)
- JICPA (Japan)
- ACRA (Singapore)
- SAICA (South Africa)

The primary materials are consisting of publicly available documents issued by the aforementioned bodies, including: CPD regulations, ethics education factsheets, ethical training policies, licensing or renewal guidance, national compliance statements, SMO Action Plans (when applicable), and self-assessment reports to IFAC. All documents were sourced from public-facing regulatory websites or professional body portals.

Texts were purposively selected based on relevance sampling (Krippendorff, 2004: 118-120), accounting bodies with a clearly documented ethics education policy applicable to both initial and continuing professional development.

*Coding Framework and Codebook Development*

A structured codebook was developed based on the learning outcomes and benchmarks in IES 4 (2025) and IES 7 (2020), the IESBA Code of Ethics' five fundamental principles, and the thematic categories in the IFAC Self-Assessment Tool.

The codebook, shown in Figure 1, captures key thematic areas as primary codes: Presence of ethics in IPD, quantified ethics CPD hours, explicit reference to the IESBA Code of Ethics, assessment mechanisms (exams, reflection, etc.), CPD verification systems and sanctions, use of reflective or behavioural ethics tools, and flexibility in CPD provider choice.

**Figure 1**: Codebook for Content Analysis of Ethics Education Requirements

| | Code Category | Definition | Primary Source(s) |
|---|---|---|---|
| **1** | Ethics in IPD | Ethics learning outcomes are integrated into initial professional education | IES 4; IESBA Code |
| **2** | CPD Ethics Hours (Quantified) | Ethics CPD is defined by a specific number of hours per period (e.g., 4/2 yrs) | IES 7; IFAC Self-Assessment Tool |
| **3** | IESBA Code Referenced | Explicit reference or adoption of the IESBA Code in CPD or qualification standards | IES 4; IESBA Code |
| **4** | Assessment Method | Whether ethics is assessed via exams, modules, or reflection | IES 4; IES 7; PAO regulations |
| **5** | CPD Verification | Existence of monitoring or audit mechanisms for ethics-related CPD | IES 7; IFAC Self-Assessment Tool |
| **6** | Reflective Tools | Use of reflection-based learning or behavioural ethics tools | SAICA documentation; Ethics education frameworks |
| **7** | Training Provider Flexibility | Acceptance of external or online ethics CPD providers | National PAO policies; IFAC SMO 2 |

Source: Own prepared

Following Krippendorff (2004: 21-24, 132-135), the documents were treated as "communication texts for analysis," and each code was applied systematically using a standardized protocol.

A subset of the documents was double-coded by a second researcher to ensure inter-coder reliability, using consensus resolution for discrepancies (Kuckartz & Rädiker, 2023: 138). In line with Schreier (2012: 26-29), within-case consistency and cross-case comparability were emphasized in the interpretation phase. A color-coded comparative table was then constructed to identify patterns of convergence and divergence across professional bodies.

## 3. FINDINGS

A comparative content analysis of 14 professional accountancy bodies and regulators revealed both common international standards and substantive divergences in pedagogical depth and the implementation strategies of ethics education. The analysis was conducted by a structured codebook shown below in Figure 2 based on IES 4, IES 7, the IESBA Code, and the IFAC Self-Assessment Tool in order to increase coding reliability, especially given the policy-oriented and regulatory nature of the documents.

**Figure 2:** Comparative Codebook: Ethics Education & CPD Compliance Across Fourteen Bodies

| No. | Jurisdiction/Body | Ethics in IPD | Ethics CPD Hours | IESBA Code Referenced | Assessment Method |
|---|---|---|---|---|---|
| 1 | Texas TSBPA (USA) | ⚠ Required for licensing | ☑ 4 hrs / 2 yrs | AICPA-based | ☑ Online exam |
| 2 | NYS PAB (USA) | ☑ Fully embedded in required education and explicitly tested in CPA exam | ☑ 4 hrs / 3 yrs | General ethics | ☑ Self-study / live CPE |
| 3 | California Board (USA) | ☑ PETH Exam | ☑ 4 hrs / 2 yrs + ethics exam | | ☑ Licensing ethics exam |
| 4 | SAICA (South Africa) | ☑ Pre- & post-qualification | ☑ Mandatory, no fixed hours | IESBA-aligned | ☑ Reflective learning + CPD |
| 5 | KGK (Turkey) | ⚠ Ethics in licensing exam, no structured | ☑ 5 hrs / 3 yrs | ISQC + IESBA alignment | ☑ Attendance-based |
| 6 | ACCA (Global) | ☑ Ethics & Professional Skills module | ⚠ Required, not quantified | IESBA-aligned | ✗ Not required |
| 7 | ICAEW (UK) | ☑ Ethics Learning Programme | ☑ min 1 hr / year | IESBA-aligned | ☑ Online modules |
| 8 | IDW/ WPK (Germany) | ✗ Not integrated | ⚠ Ethics within general CPD | Implicit | ☑ Seminar-based |
| 9 | JICPA (Japan) | ☑ integrated into professional education and tested pre-certification | ☑ Within structured CPD | IESBA-aligned | ☑ Built into CPD |
| 10 | CPA Australia | ⚠ In CPA program and assessed in exam | ☑ 10 hrs / 3 yrs | IESBA-aligned | ✗ Not required |
| 11 | CA ANZ (New Zealand) | ☑ Explicitly taught and assessed in mandatory CA Program course | ☑ 6 hrs / 3 yrs | IESBA-aligned | ⚠ Learning record |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **12** | CPA Canada | ☑ | Competency Map 2.0 | ☑ | 4 hrs / 3 yrs | IESBA-aligned | ☑ | Online learning path |
| **13** | ACRA (Singapore) | ☑ | Public Practice Programme required | ☑ | 6 hrs / 3 yrs | Referenced | ✗ | Not required |
| **14** | OROC (Portugal) | ✗ | Integrated into required accounting curriculum | ⚠ | Ethics CPD informal/planned | SMO Action Plan | ✗ | Not required |

Source: Own prepared

**Figure 2:** Comparative Codebook: Ethics Education & CPD Compliance Across Fourteen Bodies-Continued

| No. | Jurisdiction/Body | | CPD Verification | Reflective Tools | Training Provider Flexibility | |
|---|---|---|---|---|---|---|
| 1 | Texas TSBPA (USA) | ☑ | Certificate required | ✗ | ☑ | High |
| 2 | NYS PAB (USA) | ☑ | Random audits | ✗ | ☑ | High |
| 3 | California Board (USA) | ☑ | CBA Connect tracking | ✗ | ⚠ | Medium |
| 4 | SAICA (South Africa) | ☑ | Member declaration | ☑ | ☑ | High |
| 5 | KGK (Turkey) | ☑ | Certified provider approval | ✗ | ✗ | Low |
| 6 | ACCA (Global) | ☑ | Self-declaration and audit | ✗ | ☑ | High |
| 7 | ICAEW (UK) | ☑ | Subject to audit | ✗ | ☑ | High |
| 8 | IDW/ WPK (Germany) | ☑ | Monitoring framework | ✗ | ⚠ | Medium |
| 9 | JICPA (Japan) | ☑ | Digital tracking | ✗ | ✗ | Low |
| 10 | CPA Australia | ☑ | Documentation retained | ✗ | ☑ | High |
| 11 | CA ANZ (New Zealand) | ☑ | Self-declaration and audit | ✗ | ☑ | High |
| 12 | CPA Canada | ☑ | Audit and recordkeeping | ✗ | ☑ | High |
| 13 | ACRA (Singapore) | ☑ | Renewal process-based | ✗ | ⚠ | Medium |
| 14 | OROC (Portugal) | ✗ | Not enforced | ✗ | ✗ | Low |

Source: Own prepared

The comparative analysis reveals a broad formal convergence in ethics education requirements among professional accounting bodies, particularly in alignment with IES 7 and the IESBA Code of Ethics. A majority of the jurisdictions (11 out of 14) mandate a specific number of ethics-related *CPD hours*, typically ranging between 4 and 10 hours per triennium. *The IESBA Code* is referenced explicitly or implicitly by nearly all professional bodies even through localized adaptations such as the AICPA standards in the United States. Recent developments, such as the increased ethics CPD requirement by Chartered Accountants Australia and New Zealand (CA ANZ) from 2 to 6 hours beginning in July 2024, demonstrate a regulatory trend toward more rigorous and standardized ethical expectations globally.

However, the incorporation of ethics in *initial professional development (IPD*), as prescribed in IES 4, remains uneven across jurisdictions. While many jurisdictions — including SAICA (South Africa), ICAEW (UK), CPA Canada, JICPA (Japan), ACCA (Global), CA ANZ (New Zealand), ACRA (Singapore), and NYS PAB (USA) — embed ethics explicitly and assess it during the pre-qualification stage, others fall short. Jurisdictions such as Texas and KGK (Turkey) addresses ethics primarily through licensing exams rather than structured IPD education, whereas IDW/WPK (Germany) and OROC (Portugal) don't systematically integrate ethics at all and deliver ethics education exclusively through

CPD after licensure. This delayed or fragmented exposure may impede the early internalization of ethical standards, weakening professional identity formation and ethical resilience.

*Assessment mechanisms* for ethics continuing education are limited across jurisdictions. Only California, through its Professional Ethics for CPAs (PETH) exam, and SAICA, through its reflective CPD framework, demonstrate substantive ethics evaluation. Most jurisdictions rely on self-reported or attendance-based models without assessing ethical competence or decision-making. This lack of assessment diminishes the formative power of ethics training.

Similarly, the integration of *reflective tools* into ethics training is virtually non-existent. Only SAICA employs structured reflection to support ethical learning and judgment. The absence of such tools in other professional bodies reflects a predominant focus on technical compliance rather than on the development of ethical awareness or behavioural change. This finding aligns with Dellaportas (2006: 400) and Cote, J. – Latham (2019: 555-556) who argue for a shift from knowledge-based ethics instruction to identity-forming and experiential approaches such as active learning.

*Training provider flexibility* also shows meaningful divergence in implementation. While most jurisdictions, such as ACCA, CPA Australia, and ICAEW, allow members to select CPD providers freely, others, including KGK (Turkey), JICPA (Japan), and OROC (Portugal), require ethics education to be delivered exclusively by centrally approved providers. This variation has implications for accessibility, quality control, and the localization of content. Highly flexible applications promote accessibility and professional autonomy, whereas centralized systems aim for consistency and standardization.

Finally, *CPD verification* mechanisms are becoming more robust across jurisdictions. Digital tracking systems (e.g., CBA Connect, ICAEW CPD Audit), audit procedures, and annual declarations are now common in countries such as Canada, the UK, Australia/ New Zealand, and Singapore. These mechanisms contribute to the enforceability of ethics training and enhance trust in the profession's self-regulatory capacity. Nonetheless, several jurisdictions, including Portugal and Germany, still operate with limited or unclear monitoring frameworks.

In sum, while formal alignment with international ethics education standards has increased, critical gaps persist in the depth, delivery, and assessment of ethics learning. The evidence suggests that a more harmonized and behaviourally grounded approach to ethics education is needed. For instance, some bodies, like OROC (Portugal), reference ethics in aspirational terms but lack structured, enforceable CPD policies. Others, like IDW (Germany), enforce general CPD but do not separate ethics as a targeted dimension. Ethics education should prioritize early exposure, reflective learning, and competence evaluation in line with the broader goals of the IESBA Code and the IESBA's educational framework.

## 4. CONCLUSION

The International Education Standards (IESs) are designed not only to guide ethics education but also to reduce international disparities in qualification requirements, support global mobility of accountants, and offer benchmarking tools for IFAC member bodies. However, their implementation is challenged by the diversity of national education systems and professional training structures (McPeak, Pincus & Sundem, 2012: 747). Each IES explicitly acknowledges this variability, recognizing that no single model of education, experience, or assessment can uniformly apply across jurisdictions (McPeak, Pincus & Sundem, 2012: 750).

Following recent ethical failures between 2018 and 2025, ethics and ethics education are at the top of the global agenda to search for ways to ensure education programs go beyond gaining knowledge of ethical standards and bring ethics to the forefront of making judgments and guiding decisions (IESBA, 2024a: 7). This study examined the ethics education and continuing professional development (CPD) requirements across 14 professional accounting bodies, with particular attention to their alignment with the International Education Standards (IESs) and the IESBA Code of Ethics. Using a qualitative content analysis approach informed by a structured codebook, the study demonstrates both significant areas of convergence and persistent divergences in how ethics education is regulated, delivered, and evaluated across jurisdictions.

A clear trend toward formal convergence was observed: most professional bodies mandate ethics-related CPD and reference the IESBA Code either directly or through localized frameworks. Recent regulatory developments, such as Australia and New Zealand's increased ethics CPD threshold, further illustrate an ongoing global shift toward reinforcing ethical competence as a core professional expectation. However, deeper inconsistencies remain. The integration of ethics in Initial Professional Development (IPD) is uneven, and few jurisdictions assess ethical learning outcomes or provide reflective tools that are crucial for fostering ethical awareness and judgment. This disconnects between global standards and national practices underscores a gap between structural compliance and substantive ethical capacity.

Overall, the findings suggest that while the profession is moving toward global alignment in form, alignment in substance, particularly regarding pedagogical depth, behavioural relevance, and early ethics integration, remains limited. Addressing these gaps require regulatory adjustments, a conceptual shift toward ethics education that prioritizes formative development, reflective engagement, and measurable ethical competence. Such reform is essential to ensure that ethics in accounting is not merely an obligation to fulfill, but a foundation upon which public trust and professional integrity are built. Since the fragmented landscape may slow efforts toward regulatory harmonization and impede trust in cross-border professional competence.

There are some limitations to this study that may impact the interpretation. The number of oversight authorities included in the study should be larger. However, the availability of the formal documents is limited. Also, the form of publicly available regulatory documents is not standardized or similarly structured. Moreover, the documents may not fully capture the informal practices, institutional interpretations, or recent updates in ethics education implementation across jurisdictions.

The IFAC might coordinate comparative assessments or benchmarking reports to identify inconsistencies across member jurisdictions and share best practices. Workshops about ethical dilemmas and ethical decision-making may be included in ethics education programs (Dellaportas et al., 2011: 73).

Future research could highlight emerging technologies that are transforming ethics education and continuing professional development (CPD). Tools such as e-learning platforms and AI-driven simulations can make ethics training more engaging and practical through interactive, scenario-based learning. Further analysis could also test the association between legal tradition and ethics integration and consider additional institutional factors, including financial system type, colonial legacies, and the strength of professional bodies.

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VIII. INTERNATIONAL SYMPOSIUM ON ACCOUNTING AND FINANCE
Cohosted by MUFAD and Mudanya University
Faculty of Arts and Social Sciences
25-26 July 2025- ONLINE

# THE RELATIONSHIP BETWEEN CRYPTOCURRENCIES AND STOCK MARKETS: A SYSTEMATIC LITERATURE REVIEW

**Burak Özdoğan[*], İlke Dikici[**]**

## ABSTRACT

This study conducts a systematic review of the literature to examine the interactions between cryptocurrencies—primarily Bitcoin—and traditional financial markets. These include stock markets, inflation, interest rates, macroeconomic indicators, financial stability, and monetary frameworks. As academic interest in this domain has expanded, encompassing diverse methodologies and objectives, the need for a structured synthesis has become increasingly evident. Using the SPAR-4-SLR protocol, 28 quantitative studies published between 2014 and 2022 were selected through rigorous screening based on relevance and contextual fit. The review reveals that cryptocurrencies function predominantly as portfolio diversifiers, with limited evidence supporting their use as effective hedging tools. A key contribution of this study is the introduction of a country-based classification model (CAT A–F), which enables comparative insights into the cryptocurrency–stock market relationship across various regulatory and economic settings. This review not only identifies critical gaps in existing literature but also proposes a conceptual foundation to guide future empirical and theoretical research in the field of crypto-finance interactions.

**Keywords:** Literature Review, Crypto Assets, Stock Markets, Inflation, Interest Rates

## KRİPTO PARA BİRİMLERİ VE HİSSE SENETLERİ PİYASALARI ARASINDAKİ İLİŞKİ: SİSTEMATİK BİR LİTERATÜR İNCELEMESİ

## ÖZET

Bu çalışma, başta Bitcoin olmak üzere kripto para birimleri ile geleneksel finans piyasaları arasındaki etkileşimleri incelemek için literatürün sistematik bir incelemesini yürütmektedir. Bunlara borsa piyasaları, enflasyon, faiz oranları, makroekonomik göstergeler, finansal istikrar ve parasal çerçeveler dahildir. Bu alana olan akademik ilgi, çeşitli metodolojileri ve hedefleri kapsayacak şekilde genişledikçe, yapılandırılmış bir senteze duyulan ihtiyaç giderek daha belirgin hale gelmiştir. SPAR-4-SLR protokolünü kullanarak, 2014 ile 2022 arasında yayınlanan 28 nicel çalışma, alaka ve bağlamsal uyuma dayalı titiz bir tarama yoluyla seçilmiştir. İnceleme, kripto para birimlerinin ağırlıklı olarak portföy çeşitlendiricileri olarak işlev gördüğünü ve etkili korunma araçları olarak kullanımlarını destekleyen sınırlı kanıt olduğunu ortaya koymaktadır. Bu çalışmanın temel katkılarından biri de çeşitli düzenleyici ve ekonomik ortamlarda kripto para birimi-borsa piyasası ilişkisine ilişkin karşılaştırmalı içgörüler sağlayan ülke tabanlı bir sınıflandırma modelinin (CAT A–F) tanıtılmasıdır. Bu inceleme, mevcut literatürdeki kritik boşlukları tespit etmenin yanı sıra, kripto-finans etkileşimleri alanında gelecekteki ampirik ve teorik araştırmalara rehberlik edecek kavramsal bir temel önermektedir.

**Anahtar Kelimeler**: Literatür Taraması, Kripto Varlıklar, Borsalar, Enflasyon, Faiz Oranları

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## 1. INTRODUCTION

With the introduction of Bitcoin as a decentralized digital currency, the fields of economics and finance witnessed a surge in scholarly interest, setting forth a new research agenda. The cryptocurrency ecosystem led by Bitcoin, exceeding a total value of $1 trillion, has facilitated the emergence of applications such as NFTs, token economies, and decentralized finance built on blockchain platforms like Ethereum, which support smart contracts and generate considerable value.

Early discourse primarily debated whether Bitcoin qualified as a currency, while other discussions focused on its emergence as a novel asset class, with potential implications for economics, finance, and diverse sociological perspectives. The classification of crypto assets as mediums of exchange or stores of value (Glaser et al., 2014; Li and Wang, 2017; Baur and Dimpf, 2021;) has profoundly shaped the development of related literature. Additionally, concerns regarding the anonymity of cryptocurrencies, which may facilitate their use for criminal and illicit transactions have also been a significant point of discussion. (Kethineni and Cao, 2019; Maume, 2020).

Since Bitcoin emerged with a bold promise as the world's hard currency in terms of financial stability (Nakamoto, 2008), the research questions whether this argument has a solid basis or does not find support in scholars' works. The emergence of cryptocurrencies has transformed many aspects of the conventional finance paradigm. They establish the connection between fiat currencies and the economy through stock exchanges and exchange rates on a country-by-country basis. Vidal-Tomas (2021) contends that cryptocurrencies can mitigate financial risks during periods of economic instability, whilst some other studies have not identified a significant relationship between cryptocurrencies and international exchange rates (Corbet et al., 2018) or monetary policies (Nguyen et al., 2019; Lyócsa et al., 2020).

This paper explores the interaction of cryptocurrencies with stock exchange markets. The objective is to analyze the referenced literature, develop a structured literature review, and identify significant gaps to inform future research. The organization of the paper is as follows: the subsequent section presents the theoretical framework, followed by a discussion on methodology and research techniques, then sections on results and discussion. The concluding section provides final remarks and recommendations.

## 2. THEORETICAL BACKGROUND AND CONCEPTUAL FRAMEWORK

The recognition of cryptocurrencies as a novel asset class has prompted numerous scholarly investigations aimed at establishing theoretical foundations for their interactions with existing assets. Understanding potential correlations, cointegrations, and relationships between cryptocurrencies and stock markets, exchange rates, gold, and macroeconomic indicators has been a central focus of many studies. Despite the fact that cryptocurrencies have not yet made a tangible contribution to global financial stability (International Monetary Fund (IMF), 2021), the relationships between stock market prices and exchange rates in both developed and developing countries continue to be a subject of discourse. Recent surveys have indicated that the adoption of crypto economies in some developing countries surpasses that in developed nations (Statista, 2021; Finder, 2021).

Research investigating the correlation between stock market prices and exchange rates has utilized models such as the portfolio-balance model (Gavin, 1989; Frankel, 1987), with some concluding that these relationships originate from substantial capital flows within international financial markets (Tian and Ma, 2010). Variations in the correlations between stocks and exchange rates have been documented in developing countries. For example, while the Chinese market exhibits a long-term one-way cointegration (Deng and Yang, 2008), no such relationship has been identified in Indian markets (Bhattacharya and Mukherjee, 2003; Rahman and Uddin, 2009; Muhammad and Rasheed, 2002). Whereas earlier research primarily focused on country-specific stock markets and global exchange rates, recent studies have explored the influence of emerging market economies on stock returns and exchange rates—both in the short term and long term—through the lens of macroeconomic balances and global crises.

Building upon both theoretical and empirical foundations provided by the literature, the research employs a conceptual model that integrates the primary mechanisms influencing the relationship between cryptocurrencies and stock markets. The model is designed to represent the multi-dimensional and context-dependent nature of this interaction, which fluctuates across different countries, regulatory frameworks, and historical periods. It aims to connect empirical findings with theoretical reasoning by introducing four interdependent analytical layers:

- External drivers: On a macro scale, systemic events such as financial crises, pandemics, geopolitical tensions, or changes in global monetary policy trigger structural shocks that impact both cryptocurrency and stock markets. These external stimuli often heighten investor uncertainty and lead to increased cross-market volatility.

- Mediating Variables: The transmission of these shocks is heavily influenced by intermediary variables, including the regulatory environment, investor behavior, and market infrastructure. These variables delineate the extent to which cryptocurrency markets function autonomously or in conjunction with traditional capital markets.

- Crypto-Stock Market Interaction: The model is built around the dynamic and non-linear interaction between crypto and stock markets. This encompasses time-varying correlations, volatility spillovers, and asymmetric responses to shocks and contagion, particularly during periods of crisis.

- Observed Financial Outcomes: Depending on the configuration of the factors outlined above, cryptocurrencies may assume various roles within investment strategies, such as diversifiers, hedging instruments, or conditional safe-haven assets.

  Accordingly, the research questions of this study may be stated as follows:

  - RQ1: What are the theoretical frameworks, research methods, and contexts of interest that previous researchers of cryptocurrency studies, including stock exchanges, have examined?
  - RQ2: What research gaps currently exist, and what potential future directions emerge in the study of cryptocurrencies and stock exchanges?

## 3. METHODOLOGY

To address the research questions, this study undertakes a systematic review. A systematic literature review is instrumental in assessing the current state of a particular field and identifying potential avenues for future research agendas (Lim, Kumar & Ali, 2022). Given the aim of this paper to present the existing body of research and knowledge on the relationships between cryptocurrency stock exchanges and macroeconomic indicators, intending to pinpoint areas where the literature should evolve, this study falls within the category of framework-based reviews, as classified by systematic literature review methodologies (Paul & Criado, 2020; Paul & Barari, 2022).

The adoption and implementation of a protocol ensures the reproducibility and transparency of the research, as well as its rigorous nature. Thus, this study employed the SPAR-4-SLR protocol, established by Paul et al. in 2021, to conduct a systematic review of the literature. According to the protocol, the study's structure was developed using three key steps: aggregation, arrangement, and evaluation. The protocol structure followed in the study is presented in Table 1.

**Table 1.** SPAR-4-SLR review protocol of the study

| Assembling | |
|---|---|
| **Identification**<br>**Domain:** Cryptocurrencies and stock exchanges<br>**Research questions:**<br>1. What are the theoretical frameworks, research methods, and contexts of interest that previous researchers of cryptocurrency studies including stock exchanges have looked at?<br>2. What research gaps currently exist, and potential future paths emerge in cryptocurrency studies and stock exchanges?<br>**Source type:** Peer-reviewed research papers in high-quality journals<br>**Source quality:** Web of Science | **Acquisition**<br>**Search mechanism and material acquisition:** Web of Science<br>**Search keywords:** “cryptocurrency”, “cryptocurrencies”, “stock market”, “AND” (ii) “stock”, and “stock market”.<br>**Search period:** 2016-2022<br>**Articles returned from search:** 381 |
| **Assessing** | |
| **Organization**<br>**Organizational codes:** Paper title, year, journal, research country, author, methodology | **Purification**<br>**Article type excluded:** Articles excluded due to language, field, and topic, duplicates, and out of context (n=353)<br>**Article type included:** Papers addressing cryptocurrencies and stock exchange (n=28) |
| **Arranging** | |
| **Evaluation**<br>**Analysis method:** Bibliometric and content analysis<br>**Agenda proposal method:** Read abstracts, methodology, findings, and conclusions. | **Reporting**<br>**Reporting convention:** Figure, table, words (narratives)<br>**Limitations:** Data type (Journals with English only), review limited to specified indexes and publishers under the business, finance, economics, econometrics, business, management, and accounting categories |

We employed a selection of keywords to identify pertinent publications released from 2016 to 2022 that examine the connection between cryptocurrencies and stock exchanges. These keywords included "cryptocurrency," "cryptocurrencies," "stock market," "AND" (ii) "stock," and "stock market." In line with the review protocol, our search on the Web of Science database yielded 381 papers focusing on cryptocurrencies and stock exchanges, as per the aforementioned databases. Following the purification process outlined in Table 1, 28 papers remained for further analysis.

## 4. RESULTS AND DISCUSSION

Results and discussions are shown across four separate analytical layers as outlined in the theoretical background section.

### 4.1. External Drivers

In accordance with the external drivers layer of our framework, the subsequent evidence demonstrates how global shocks and crises have impacted the behavior of cryptocurrencies in comparison to equity markets.

In examining the stability and sequential regularity observed in cryptocurrency prices and stock markets before and during the pandemic, Lahmiri and Bekiros (2020) identified that the cryptocurrency market exhibited greater volatility than international stock markets during this period. To substantiate the hypothesis that cryptocurrency serves as a safe haven, Marobhe (2021) furnished evidence through an analysis of major stock indices and cryptocurrencies (Bitcoin, Ethereum, and Litecoin) employing the Bayesian structural vector autoregression technique.

Finally, research conducted during and after the pandemic has examined the role of cryptocurrencies in investor portfolios. Conlon and McGee (2020) found that Bitcoin does not serve as a safe haven for the S&P 500, whereas Corbet et al. (2020) identified heightened dynamic correlations between Bitcoin and conventional markets. Bouri et al. (2020a) recognized Bitcoin as a hedging asset, whereas Ripple and Stellar were classified as safe-haven assets. Additionally, Litecoin and Monero were identified as possessing hedging properties. They also indicated that maintaining Bitcoin alongside the S&P 500 during periods of crisis increases the downside risk of the portfolio. In a separate study, Umar et al. (2020) demonstrated that the correlations between the majority of cryptocurrency pairs and stock market indices exhibit temporal fluctuations, with negative shocks exerting a more substantial influence than positive shocks of equivalent magnitude. Tiwari et al. (2019) found asymmetric volatility and weak positive correlations between different cryptocurrencies and the S&P 500 index.

These macro-level insights provide a foundational basis for analyzing the institutional and behavioral channels through which such shocks are transmitted, as elaborated in Section 4.2.

### 4.2. Mediating Variables

By shifting the focus from external shocks to the various factors that shape how markets respond, this layer helps us understand the important roles played by regulation, the quality of institutions, and investor awareness.

Therefore, in this paper, we present a dual-layered classification and coding framework designed to analyze the relationship between cryptocurrencies and stock markets. Initially, the selected articles were classified by country using a revised CAT A–F classification scheme, developed based on financial stability, regulatory maturity, and economic context. This classification enables comparative insights across different national environments and is documented in Table 2.

**Table 2.** Categories of the Countries by Geographic Regions

| Category | Criteria Summary | Representative Countries |
|---|---|---|
| **CAT A** | Highly stable financial systems, comprehensive crypto regulation or supportive innovation zones, high-income developed economies. | USA, Japan, Germany, Sweden, Estonia, South Korea, Canada, UK, France, UAE, Bahrain |
| **CAT B** | Moderate-to-high financial capacity, developing or restrictive crypto regulation, upper-middle income or conservative market openness. | China, Malaysia, Chile, Saudi Arabia, Kuwait |
| **CAT C** | Emerging markets, limited regulatory clarity or partial bans, mid-level market depth, growing user base. | India, Turkey, Brazil, South Africa, Mexico, Qatar, Oman |
| **CAT D** | Low regulatory capacity, volatile macroeconomic environment, political or institutional uncertainty. | Vietnam, Argentina, Nigeria, Pakistan, Indonesia |
| **CAT E** | Severe financial fragility, inflation or sanctions-driven crypto use, lack of functioning monetary systems. | Venezuela, Iran, Zimbabwe |
| **CAT F** | Conflict-affected or sanctioned environments with disruptive crypto adoption patterns and financial isolation. | Russia, Ukraine |

Second, a thematic coding table was developed to identify key research areas, methodological approaches, data timeframes, and country classifications. As documented in Table 3, thematic aspects such as volatility spillovers, hedge and safe-haven features, and contagion effects were identified and used to organize the synthesis of results. Given that numerous studies under review encompassed multiple countries within their empirical scope, both geographic and thematic classifications were employed concurrently to interpret cross-regional dynamics and methodological aspects of diversity.

**Table 3.** Thematic Coding of The Papers

| Author(s) | Key Focus | Methodology | Period | Country Category |
|---|---|---|---|---|
| **Liang et al. (2019)** | Comparative asset behavior: crypto vs forex vs stock | Correlation Matrix and Asset Tree | 2015–2018 | CAT A |
| **Sami & Abdallah (2020)** | Crypto-stock substitution effect in Gulf economies | IV-GMM | 2014–2019 | CAT C |

| | | | | |
|---|---|---|---|---|
| **Umar et al. (2020)** | Crypto-stock dynamic correlation and shock asymmetry | ADCC (Asymmetric DCC) | 2013–2019 | CAT A, B |
| **Tiwari et al. (2019)** | Dynamic conditional correlations and hedging performance | Copula-ADCC-EGARCH | 2015–2018 | CAT A |
| **Kumah & Mensah (2021)** | Crypto integration with African stock indices | Bivariate/Multivariate Wavelet | 2015–2019 | CAT E |
| **Uzonwanne (2021)** | Return and volatility spillovers | VARMA-AGARCH | 2013–2018 | CAT A |
| **Hung (2022)** | Asymmetric connectedness: S&P 500, oil, gold, Bitcoin | Diebold-Yilmaz Spillover Index | 2013–2022 | CAT A |
| **Ho (2020)** | Crypto influence on financial stocks in China & Taiwan | Hausman test | 2016–2019 | CAT B, C |
| **Liu et al. (2021)** | Crypto shocks & macro impact | Structural VAR | 2015–2020 | CAT A |
| **Salisu et al. (2019)** | Bitcoin predictability in G7 stock markets | ARCH-LM, GARCH | 2010–2017 | CAT A |
| **Caferra & Vidal-Tomas (2021)** | Crypto–stock co-movement during COVID-19 | Wavelet + Markov Switching | 2019–2020 | CAT A |
| **Lahiani et al. (2021)** | Bitcoin futures and tail dependence | GARCH | 2016–2019 | CAT A, B |
| **Gil-Alana et al. (2020)** | Are cryptocurrencies and stocks cointegrated? | Fractional Integration | 2015–2018 | CAT A |

| | | | | |
|---|---|---|---|---|
| **Yousaf & Ali (2021)** | Intraday linkages during COVID-19 | BEKK–AGARCH | 2019–2020 | CAT A |
| **Vardar & Aydogan (2019)** | Spillovers in Turkish market | VAR–GARCH | 2010–2018 | CAT C |
| **Zhang et al. (2018)** | Inefficiency of crypto, DJIA correlation | MF-DFA, MF-DCCA | 2013–2018 | CAT A |
| **Aydogan et al. (2022)** | Spillovers among G7/E7 stock markets & crypto | MGARCH | 2012–2021 | CAT A, B |
| **Kliber et al. (2019)** | Safe haven & hedge across economies | Asymmetric GARCH | 2014–2017 | CAT A, B, C |
| **Majumder (2022)** | Crypto vs commodities for hedge in India | VAR-BEKK, DCC | 2013–2020 | CAT C |
| **Ha (2022)** | COVID-19 crypto-stock linkages via TVP-VAR | TVP-VAR | 2018–2021 | CAT A, B |
| **Lucey et al. (2022)** | Asymmetric contagion effect | SJC-Copula-GARCH | 2017–2020 | CAT A |
| **Matkovskyy et al. (2021)** | Portfolio performance boost from crypto | Probabilistic Utility | 2019 | CAT A |
| **Conlon & McGee (2020)** | Safe haven behavior of Bitcoin in bear market | Two-moment VaR | 2019–2020 | CAT A |
| **Lahmiri & Bekiros (2020)** | Instability from COVID-19 across markets | LLE + Entropy | 2019–2020 | CAT A, B, C |
| **Sami & Abdallah (2020)** | Crypto impacts in MENA including Gulf | Cointegration & Granger | 2014–2018 | CAT C |
| **Lahmiri & Bekiros (2021)** | Long memory during COVID in crypto/stocks | ARFIMA-FIGARCH | 2019–2020 | CAT A, B, C, D |

| | | | | |
|---|---|---|---|---|
| **Omane-Adjepong et al. (2021)** | Herding in crypto vs emerging markets | CSAD | 2016–2019 | CAT C |
| **Marobhe (2021)** | Safe haven roles of BTC, ETH, LTC during panic | Bayesian SVAR | 2020–2021 | CAT A, B |

An analysis of the countries examined in the 28 selected articles indicates that Category A (CAT A) countries predominate the literature, with 21 out of 28 studies (approximately 75%) focusing wholly or partially on highly developed economies such as the USA, Germany, Japan, and the UK. This intense focus on CAT A countries underscores a research inclination towards environments characterized by high financial stability, where the behavior of cryptocurrencies can be scrutinized, devoid of the confounding influences of systemic volatility or institutional fragility.

These CAT A economies serve as benchmarks for comparison across other categories, providing a controlled environment in which to analyze crypto–stock relationships under stable regulatory conditions. In contrast, emerging and transitional markets—classified as CAT B and CAT C—are represented in a smaller but consistently increasing number of studies: 8 in CAT B and 5 in CAT C, respectively. These contexts are frequently analyzed concerning market volatility, policy inconsistencies, or the emerging institutional responses to cryptocurrency adoption. Although such studies are relatively limited in number, they often provide valuable insights into environments characterized by regulatory uncertainty and more fluid investment behavior.

Despite the increasing global significance of cryptocurrencies, fragile economies and regions with limited banking services—classified as CAT D and CAT E—remain vastly underrepresented in existing research. Notably, only one study (Kliber et al., 2019) explicitly includes a CAT E country (Venezuela), examining Bitcoin’s role as a safe haven during extreme crisis conditions. Finally, no studies were identified that focus on CAT D countries, such as those experiencing chronic instability, low institutional quality, or financial repression. This notable gap highlights the urgent need for future research to investigate how cryptocurrencies operate in environments where digital assets can serve not only as investment instruments but also as informal alternatives to failing financial institutions or limited capital systems.

Interestingly, although the majority of articles focus on CAT A regions, more than 50% of the authors are affiliated with institutions in emerging markets, such as Turkey, Vietnam, India, and Nigeria. This highlights a geographic imbalance in the scholarly literature: research is mainly conducted in the Global South but applied to contexts within the Global North. This trend may reflect a growing tendency among academics from emerging economies to analyze and challenge established models of crypto-financial behavior within their own more volatile and dynamic markets.

Liang et al. (2019) argue that, unlike the stock market—which usually shows clustering based on economic categories or geographic regions—the cryptocurrency market does not follow a specific clustering pattern and is marked by rapid, high-risk swings. This market fragility is attributed to macroeconomic factors and investors’ interests. Additionally, Ho (2020) examines how government policies influence cryptocurrency markets in China and Taiwan, focusing on public awareness and legal recognition of cryptocurrencies in different countries.

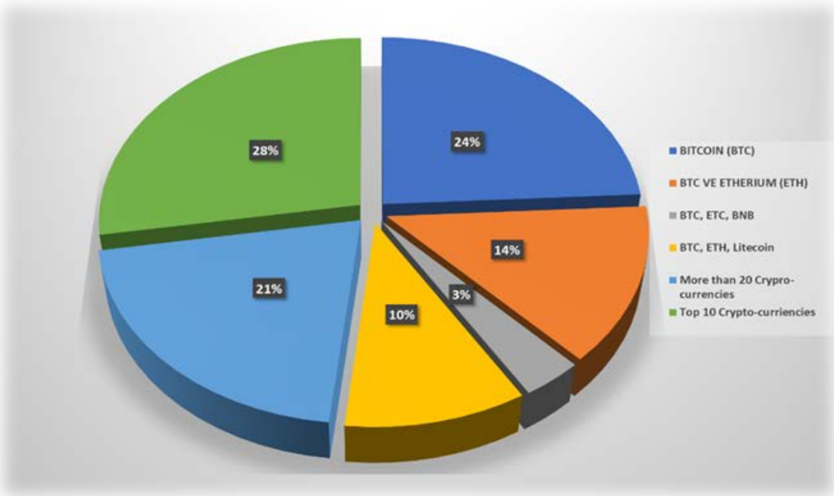
Recognizing these mediators allows for a clearer interpretation of the direct statistical connections between crypto and stock markets discussed in Section 4.3.

### 4.3. Crypto-Stock Market Interaction

After setting the context, we then analyze the empirical relationship between cryptocurrency and equity returns and volatility.

Bitcoin and Ethereum are distinguished as the most extensively examined cryptocurrencies by researchers, as illustrated in Figure 1. Other cryptocurrencies follow closely, with researchers endeavoring to identify particular correlations with stock markets, especially within emerging markets.

**Figure 1.** Distribution of the Analyzed Cryptocurrencies in the Selected Articles




Furthermore, Salisu et al. (2019) found that Bitcoin exhibits predictive capabilities regarding stock market performance in the G7 nations. Additionally, Aydoğan et al. (2022) identified significant interactions between returns and volatility across the G7 stock exchanges and the cryptocurrency market. In their study focusing on Turkey, Vardar and Aydoğan (2019) observed positive unilateral return spreads from the bond market to Bitcoin.

The documented patterns raise key questions regarding the economic importance of these connections, which we explore through analysis of specific portfolio results in Section 4.4.

### 4.4. Observed Financial Outcomes

Building on the previous analytical layers, this section evaluates whether cryptocurrencies serve as hedges, safe havens, or diversifiers under various market conditions.

While research has focused on the stock exchanges of the United States, Japan, and selected European nations, such as Estonia and Sweden, within the CAT A category, it has been argued that cryptocurrencies exhibit limited hedging capabilities (Kliber et al., 2019; Majumder, 2022; Conlon & McGee, 2020). The results of hedging analyses indicate the diversification potential of cryptocurrencies in both CAT A and CAT B nations (Kliber et al., 2019). In economies undergoing financial crises, exemplified by Venezuela, cryptocurrencies are regarded as a safe haven (Kliber et al., 2019). Contrary to existing literature, during the pandemic period, cryptocurrencies were observed to impart stability in developed nations (Marobhe, 2021). Future research employing an extended temporal dataset and a broader selection of cryptocurrencies is anticipated to provide a more comprehensive understanding of the role of cryptocurrencies as financial assets. Furthermore, a deeper examination of the role of cryptocurrencies as decentralized financial instruments during the recent Russian crisis could offer valuable insights for country-specific analyses.

Gil-Alana et al. (2020) predict that, in the future, investors and market participants might have to hold cryptocurrencies along with traditional assets. Integrating cryptocurrencies into the global economy is seen as a possible paradigm shift in investment strategies. Jiang et al. (2021) argue that cryptocurrencies may not act as a hedge or safe haven against stock market risks; however, they can function as diversifiers, especially over long-term horizons, for global, developed, emerging, and U.S. stock indices. Handika et al. (2019) examined cryptocurrencies within Asian equity markets and identified minimal correlations between five cryptocurrencies and thirteen Asian stock exchanges, indicating that cryptocurrencies do not constitute systemic risks to these markets. Bouri et al. (2017) studied the Asia Pacific stock market and suggested that while Bitcoin might not be an effective hedge asset, it can serve as a safe haven during major declines in the equity market. Sami and Abdallah (2020) investigated the correlation between the cryptocurrency market and stock market performance within the MENA region. They identified various effects depending on the implementation of Sharia principles across different countries. Finally, Majumder's (2022) study, which examines the hedging and safe-haven qualities of gold, cryptocurrencies, and commodities in relation to the Indian stock market, found that neither gold nor cryptocurrencies serve as safe-haven assets. The author attributes the weak correlation between the Indian stock market and cryptocurrencies to the limited preference for cryptocurrencies within India, stemming from legal and accounting considerations.

The mixed evidence presented below highlights the conditional character of these financial roles and establishes the foundation for the study's overarching conclusions and future research agenda.

## 5. CONCLUSION AND FUTURE RESEARCH

This systematic literature review examined 28 quantitative studies published between 2014 and 2022, concentrating on the relationship between cryptocurrencies—specifically Bitcoin—and stock markets within diverse macroeconomic and regulatory environments. The review indicated that, while cryptocurrencies are primarily employed as portfolio diversifiers, their effectiveness as hedging instruments or safe-haven assets is restricted and heavily reliant on contextual factors. The findings suggest a weak or time-varying correlation between major cryptocurrencies and traditional stock indices, which often intensifies during periods of adverse market shocks (Umar et al., 2020; Tiwari et al., 2019; Uzonwanne, 2021).

A significant contribution of this review is the introduction of an innovative country classification framework (CAT A–F), which facilitates a comparative analysis of crypto–stock market interactions across nations with differing levels of financial stability and regulatory maturity. Research originating from Category A nations, such as the United States or Japan, predominantly recognizes diversification advantages with restricted hedging efficiency. Conversely, investigations into fragile economies, such as Venezuela, suggest that cryptocurrencies may, under extreme circumstances, serve as temporary safe-haven assets (Kliber et al., 2019).

Additionally, the synthesis of the reviewed literature demonstrates that volatility, contagion, spillover effects, and asymmetric responses are recurring themes. However, significant heterogeneity exists across countries, cryptocurrencies, and periods—particularly during major systemic events such as the COVID-19 pandemic. For instance, post-pandemic evidence suggests stronger correlations between crypto and equity markets, challenging the notion of independence often attributed to digital assets (Conlon & McGee, 2020; Corbet et al., 2020).

This review establishes a conceptual foundation for understanding the intricate and evolving interactions between digital and conventional financial markets. The disparities in findings across various geographic and regulatory environments underscore the necessity for more comprehensive, region-specific studies. Furthermore, practitioners should recognize that cryptocurrencies may not invariably serve as safe harbors during periods of crisis, and evaluating their risks necessitates sophisticated modeling and scenario-based stress testing. From a theoretical perspective, the absence of cointegration in most studies underscores the distinctive asset-class characteristics of cryptocurrencies (Gil-Alana et al., 2020). Empirical research further emphasizes their behavior across diverse market conditions and investor sentiment regimes. These findings substantiate the necessity for a comprehensive analytical approach that incorporates volatility regimes, behavioral finance considerations, and macroeconomic uncertainties.

Building upon the current synthesis and the recommendations derived from the reviewed literature, the following directions for future research are proposed:

- Temporal Extensions: Research should utilize extended time horizons, incorporate high-frequency data, and assess periods before and after the pandemic to enhance understanding of structural changes in crypto–stock dynamics (Sami & Abdallah, 2020; Marobhe, 2021; Lahmiri & Bekiros, 2022).
- Geographic Expansion: There exists a significant necessity for comparative research encompassing Latin America, Africa, and East Asia. Additionally, cross-country analyses comparing legally regulated and unregulated cryptocurrency systems are essential (Kumah & Mensah, 2021; Majumder, 2022).
- Asset Class Diversification: Future research should examine the relationship between cryptocurrencies and alternative assets, including bonds, commodities, derivatives, and foreign exchange instruments (Tiwari et al., 2019; Aydoğan et al., 2022).
- Methodological Sophistication: Employing advanced econometric instruments such as copulas, asymmetric GARCH models, and structural break analysis will enhance our comprehension of volatility patterns, spillovers, and contagion effects (Gil-Alana et al., 2020; Vardar & Aydoğan, 2019).
- Cryptocurrency Diversity: Research should extend beyond Bitcoin and Ethereum to encompass coins such as Litecoin, Ripple, Stellar, and Tether, particularly in terms of hedging strategies and safe-haven performance (Majumder, 2022; Atlı ve Yılmaz., 2025).
- Investor Behavior and Regulation: Studies on herding tendencies, policy uncertainty, and institutional adoption of crypto assets offer valuable insights for regulators and central banks (Uzonwanne, 2021; Omane-Adjepong et al., 2021; Ho, 2020).
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# TÜRKİYE SUSTAINABILITY REPORTING STANDARDS COMPLIANCE MEASUREMENT: AN ARTIFICIAL INTELLIGENCE-SUPPORTED RESEARCH ON BIST SUSTAINABILITY INDEX

**Yusuf Kurt***

## ABSTRACT

**Türkiye Sustainability Reporting Standards (TSRS) represent the first national regulation mandating companies operating in Türkiye to report on sustainability within a defined standard framework. Sustainability reporting enhances corporate accountability and compels companies to take action on sustainability-related risks and opportunities, particularly concerning climate change. This study aims to determine the TSRS compliance scores of companies listed in the BIST Sustainability 25 Index using the DeepSeek artificial intelligence model. Since TSRS reporting became mandatory as of January 2024, the analysis focuses solely on reports from 2024. Compliance scores were assessed based on the core TSRS components: Governance, Strategy, Risk Management, and Metrics and Targets. An overall TSRS compliance score was also calculated by averaging these components. Among the companies, AKSA A.Ş. achieved the highest overall score, while ARÇELİK A.Ş. received the lowest. AKSA A.Ş. consistently outperformed others in all subcomponents, whereas ARÇELİK A.Ş. scored lowest in Strategy, Risk Management, and Metrics and Targets. The average TSRS compliance score across all analyzed companies was 84.63. This score can be considered satisfactory, particularly for the first year of mandatory implementation. However, in future reporting years, companies are expected to improve their compliance scores to gain a competitive advantage.**

**Keywords:** Türkiye Sustainability Reporting Standards (TSRS), Artificial Intelligence, DeepSeek, BIST Sustainability Index

## TÜRKİYE SÜRDÜRÜLEBİLİRLİK RAPORLAMA STANDARDI (TSRS) UYUM ÖLÇÜMÜ: BIST SÜRDÜRÜLEBİLİRLİK ENDEKSİ ÜZERİNE YAPAY ZEKA DESTEKLİ BİR ARAŞTIRMA

## ÖZET

**Türkiye Sürdürülebilirlik Raporlama Standardı (TSRS), Türkiye'de faaliyet gösteren şirketlerin sürdürülebilirlik raporlamasını belirli standartlar çerçevesinde yapmalarını zorunlu kılan ilk ulusal düzenlemedir. Sürdürülebilirlik raporlaması, şirketlerin hesap verebilirliğini arttırmakta ve onların başta iklim değişikliği olmak üzere sürdürülebilirlik konularına ilişkin risk ve fırsatlara karşı aksiyom almasını zorunlu kılmaktadır. Bu çalışmada BIST Sürdürülebilirlik 25 endeksinde**

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**işlem gören işletmelerin DeepSeek yapay zeka modeli ile TSRS uyum skorlarını tespit etmek amaçlanmıştır. Türkiye'de TSRS raporlaması 2024 Ocak ayı itibari ile zorunlu tutulduğundan, yalnızca 2024 yılı baz alınarak araştırma gerçekleştirilmiştir. TSRS uyum skorları, TSRS'nin temel içerikleri olan Yönetişim, Strateji, Risk Yönetimi ve Metrikler ve Hedefler alt bileşenleri baz alınarak oluşturulmuştur. Ayrıca bu metriklerin ortalaması alınarak genel TSRS uyum skorları hesaplanmıştır. İşletmeler bazında TSRS genel uyum skorları incelendiğinde en yüksek skorun AKSA A.Ş'ye, en düşük skorun ise ARÇELİK A.Ş ait olduğu gözlemlenmiştir. Ayrıca AKSA A.Ş'nin tüm alt bileşenlerde diğer işletmelere kıyasla en yüksek puanı aldığı görülmektedir ARÇELİK A.Ş'nin Strateji, Risk yönetimi, Metrikler ve Hedefler alt bileşenlerinde diğer işletmelere kıyasla en düşük puanı aldığı gözlemlenmiştir Analize dahil edilen işletmeler genel olarak değerlendirildiğinde TSRS genel not ortalamalarının 84.63 olduğu görülmektedir. Bu puan özellikle de TSRS uygulamasının zorunlu olduğu ilk yılda elde edilen puan olması açısından yeterli görülebilir. Ancak sonraki raporlama yıllarında işletmelerden TSRS uyum skorlarını arttırarak rekabet avantajı sağlamaları beklenmektedir.**

**Anahtar Kelimeler:** Türkiye Sürdürülebilir Raporlama Standartları (TSRS), Yapay Zeka, DeepSeek, BIST Sürdürülebilirlik Endeksi

## 1. INTRODUCTION

Sustainability reporting (SR) constitutes a core component of integrated reporting. In essence, it can be regarded as a subcategory within the broader framework of integrated reporting. According to the GRI Reporting Framework, sustainability reporting involves the measurement and disclosure of an organization's performance, along with accountability to both internal and external stakeholders, with the overarching aim of contributing to sustainable development. Lately, an increasing number of companies are reporting on their sustainability performance through sustainability reports (Hoque, 2017:242; Larrinaga et al., 2021:162).

Environmental, social and economic problems experienced at the international level, on the one hand, have increased concerns about sustainability, on the other hand, a comprehensive and integrated reporting approach has gained importance. The concerns arising from the rapid consumption of resources, the deterioration of environmental factors and the inequalities experienced in social areas have caused the studies on sustainable society and economy to accelerate (Özdemir, 2024:446).

In November 2021, the International Financial Reporting Standards (IFRS) Foundation announced the establishment of the International Sustainability Standards Board (ISSB), which operates alongside the IASB (Ali et al., 2023:2). In June 2022, the Public Oversight, Accounting and Auditing Standards Authority of Türkiye (KGK) was authorized to determine and publish the TSRS. Subsequently, in March 2023, the Department of Sustainability Standards was established under the KGK, following the granting of audit authority to the institution in November 2022.

The Türkiye Sustainability Reporting Standards (TSRS), which are relevant to most sectors and companies, were published in the Official Gazette No. 32414 on December 29, 2023, and came into effect on January 1, 2024.

The basis for establishing standards is to respond to stakeholders' demands regarding sustainability reporting, increasing trust, transparency and traceability. Will cities be able to finance their infrastructure demands as climate-related risks alter the dynamics of the municipal bond market? What are the implications for the 30-year mortgage—one of the foundational elements of modern finance—if lenders are unable to accurately assess long-term climate risks, and if flood or fire insurance becomes unavailable in high-risk regions? How might inflation, and consequently interest rates, respond if food prices rise due to increased droughts and flooding? Furthermore, how can economic growth be effectively modeled if emerging markets experience reduced productivity as a result of extreme heat and other climate-related disruptions (Fink, 2020:1; Kazak, 2024:26).

In Türkiye, the TSRS framework consists of two main standards: TSRS 1 General Requirements for Disclosure of Sustainability-Related Financial Information, and TSRS 2 Climate-Related Disclosures. TSRS 1 requires entities to disclose information on sustainability-related risks and opportunities that could reasonably affect their future financial performance. TSRS 2 focuses specifically on climate-related risks, which it categorizes into physical and transition risks.

## 2. METHODOLOGY

The main objective of this study is to assess the TSRS compliance scores of companies listed in the BIST Sustainability 25 Index using the DeepSeek AI model. The study investigates how well these companies meet TSRS requirements and identifies overall trends.

Compliance scores were calculated based on the four TSRS pillars: governance, strategy, risk management, and metrics and targets. An average score was derived for each company to calculate an overall TSRS compliance score.

Sustainability and integrated reports were obtained from the official websites of the companies. For firms that had not yet published sustainability reports, TSRS compliance reports available via the Public Disclosure Platform (KAP) were used. As TSRS reporting became mandatory in January 2024, only data from this year was included.

Four companies (Enerjisa, Koç Holding, Tekfen Holding, and Türk Traktör) were excluded due to lack of accessible reports, leaving 21 companies for analysis. The compliance scores are presented in Table 1

## 3. FINDINGS

The TSRS compliance scores of the businesses are given in the table below.

**Table 1:** 2024 TSRS Compliance Scores

| Company | Governance | Strategy | Risk Management | Metrics and Targets | Overall Score |
|---|---|---|---|---|---|
| AKSA | 94 | 95 | 90 | 93 | 93 |
| ARCELIK | 84 | 78 | 70 | 68 | 75 |
| CIMSA | 82 | 85 | 88 | 84 | 84,75 |
| DOGAN HOLDING | 84 | 83 | 81 | 82 | 82,5 |
| DOGUS OTOMOTIV | 85 | 80 | 75 | 78 | 79,5 |
| ENKA INSAAT | 85 | 80 | 75 | 90 | 82,5 |
| EREGLI DEMIR CELIK | 87 | 85 | 84 | 85 | 85,25 |

| | | | | | |
|---|---|---|---|---|---|
| FORD OTOSAN | 90 | 85 | 80 | 88 | 85,75 |
| IS BANK | 85 | 88 | 82 | 90 | 86,25 |
| KORDSA | 90 | 85 | 88 | 82 | 86,25 |
| LOGO YAZILIM | 85 | 87 | 80 | 86 | 84,5 |
| MAVI | 85 | 88 | 89 | 87 | 87,25 |
| MIGROS | 85 | 88 | 82 | 90 | 86,25 |
| OTOKAR | 85 | 78 | 82 | 75 | 80 |
| SABANCI HOLDING | 88 | 90 | 85 | 82 | 86,25 |
| SISE CAM | 85 | 88 | 83 | 80 | 84 |
| TSKB | 85 | 90 | 88 | 92 | 88,75 |
| TAV HAVALIMANLARI | 85 | 88 | 82 | 87 | 85,5 |
| THY | 85 | 88 | 82 | 90 | 86,25 |
| VESTEL | 82 | 85 | 78 | 88 | 83,25 |
| Mean | 85,8 | 85,7 | 82,2 | 84,85 | |

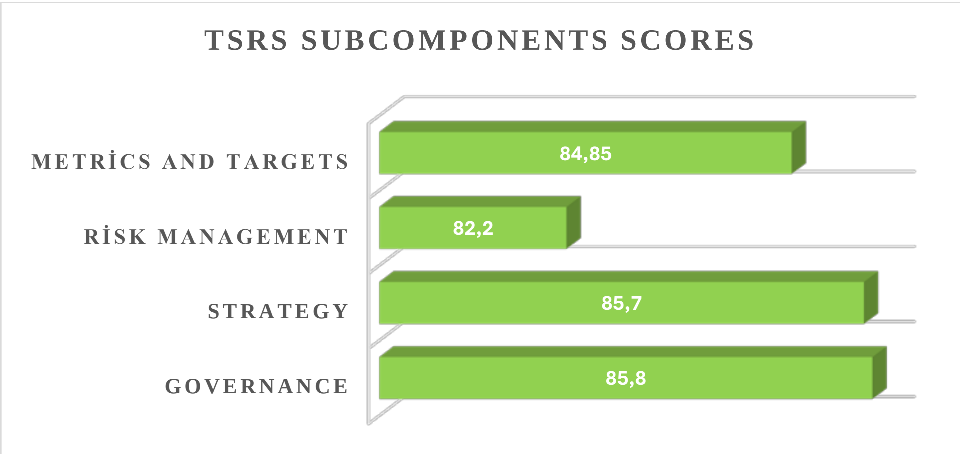


**Figure 1**: TSRS Subcomponents Scores

The highest level of compliance with the TSRS subcomponents among the companies was observed in the **Governance** dimension, followed respectively by Strategy, Metrics And Targets, and Risk Management.

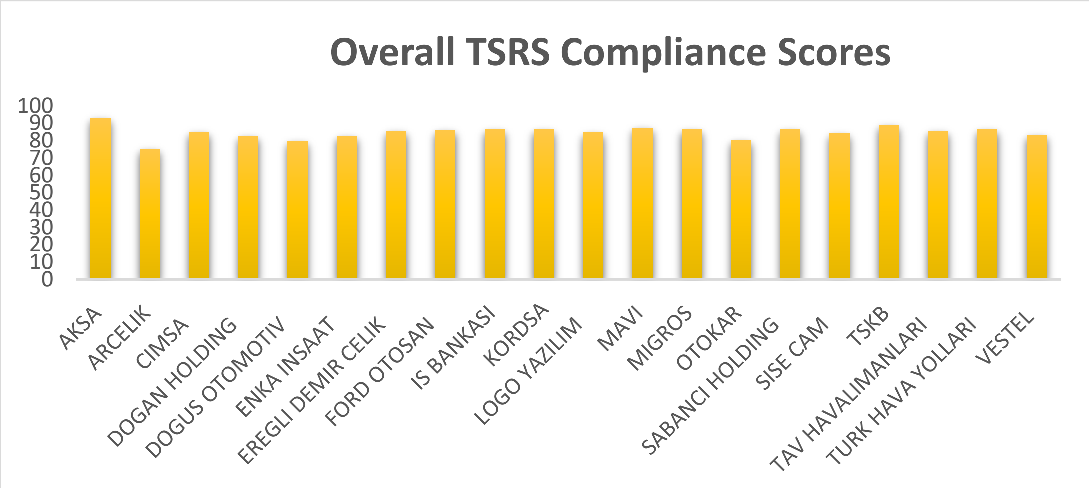


**Figure 2**: Overall TSRS Compliance Scores

An analysis of company-level overall TSRS compliance scores reveals that AKSA Akrilik A.Ş. achieved the highest compliance level, while ARÇELİK A.Ş. recorded the lowest score. A detailed review of AKSA Akrilik's sustainability reporting indicates that the company received the highest scores across all TSRS subcomponents compared to its peers.

In the governance dimension, the lowest compliance (82 points) was observed in ÇİMSA and VESTEL.

In the strategy dimension, ARÇELİK and OTOKAR had the lowest scores, each with 78 points.

In the risk management dimension, ARÇELİK again ranked lowest, scoring 70 points.

In the metrics and targets dimension, ARÇELİK had the lowest score at 68 points.

These results indicate that ARÇELİK A.Ş. received the lowest scores in Strategy, Risk Management, and Metrics and Targets when compared to other companies.

## 4. CONCLUSION

This study measured the TSRS compliance scores of companies listed in the BIST Sustainability 25 Index using the DeepSeek artificial intelligence model. A total of 21 companies were evaluated based on the TSRS subcomponents: Governance, Strategy, Risk Management, and Metrics and Targets. Scores were assigned on a scale of 1 to 100. Subsequently, average scores were calculated for each company to derive their overall TSRS compliance levels.

Based on the results, specific recommendations are provided for the highest- and lowest-performing companies:

**AKSA Akrilik** maintained top scores across all subcomponents and should continue to serve as a role model, potentially guiding other companies through best practices.

**ARÇELİK**, as a low performer, needs to take urgent action, particularly in the areas of strategy and risk management.

**OTOKAR** should integrate a sector-specific sustainability strategy, such as transitioning to electric vehicles and embracing the circular economy, in line with green transformation requirements.

**ÇİMSA A.Ş**. should establish a sustainability committee within its board of directors and increase the frequency of its sustainability reporting.

On a broader scale, companies listed in the BIST Sustainability 25 Index achieved an average TSRS compliance score of 84.63 in 2024. This score is considered satisfactory, especially given that 2024 marks the first year in which TSRS reporting became mandatory. However, in subsequent reporting years, companies are expected to enhance their compliance scores in order to secure competitive advantages.

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Türkiye Sürdürülebilirlik Raporlama Standardı (TSRS), 29 Aralık 2023 Tarihli ve 32414 Sayılı Resmî Gazete 1. Mükerrer

# THE IMPACT OF COVID-19 ON THE CORPORATE GOVERNANCE–FINANCIAL FLEXIBILITY NEXUS

**Ebru Aydoğan***

## ABSTRACT

**The aim of this study is to analyze the relationship between corporate governance ratings and financial flexibility and to explore how this relationship has changed during the COVID-19 period. The sample consists of 26 firms listed in Borsa Istanbul Corporate Governance Index between the years 2018 and 2024. A static panel data analysis was employed in the study. The findings indicate that there is no significant direct relationship between corporate governance and financial flexibility; however, this relationship turns negative during crisis period. Nonetheless during COVID-19 period all the firms strengthen their financial flexibility. In addition, the results suggest that the effective use of assets contributes to stronger a financial structures.**

**Keywords:** Financial Flexibility, Corporate Governance, Covid-19, Panel Data Analysis

## COVID-19'UN KURUMSAL YÖNETİM–FİNANSAL ESNEKLİK İLİŞKİSİNE ETKİSİ

## ÖZET

**Bu çalışmanın amacı, kurumsal yönetim derecelendirmeleri ile finansal esneklik arasındaki ilişkiyi analiz etmek ve bu ilişkinin COVID-19 döneminde nasıl değiştiğini incelemektir. Çalışma, 2018-2024 yılları arasında Borsa İstanbul Kurumsal Yönetim Endeksi'nde yer alan 26 firmayı kapsamaktadır. Çalışmada statik panel veri analizi yöntemi kullanılmıştır. Bulgular, kurumsal yönetim ile finansal esneklik arasında anlamlı bir doğrudan ilişki bulunmadığını; ancak kriz döneminde bu ilişkinin negatif yönde seyrettiğini göstermektedir. Bununla birlikte, COVID-19 dönemde tüm firmalar finansal esnekliklerini güçlendirmiştir. Ayrıca, varlıkların etkin kullanımının finansal yapının güçlenmesine katkı sağladığı sonucuna ulaşılmıştır.**

**Anahtar Kelimeler:** Finansal Esneklik, Kurumsal Yönetim, Covid-19, Panel Veri Analizi

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## 1. INTRODUCTION

Corporate governance, which refers to the adoption of a management approach that is fair, transparent, accountable, and responsible to all stakeholders. In firms with strong corporate governance mechanisms, reduced information asymmetry (Wu et al., 2023: 6) facilitates the allocation of resources to appropriate investments, lowers firm risk, and enhances the firm's credibility from the perspectives of investors and creditors. Consequently, such firms not only reduce their cost of financing (Blom- Schauten, 2006:1; Özer et al., 2023: 217) but also improve their overall performance (Nguyen et al., 2014: 9; Zagorchev-Gao, 2015: 18; Munisi- Randoy, 2013: 106; Alper-Aydoğan, 2017: 104).

Financial flexibility refers briefly to a firm's ability to access resources when needed. Firms with high financial flexibility tend to have more resilient financial structures in the face of unexpected events and can finance emerging investment opportunities at the right time, at a lower cost, and through appropriate sources (Zhang, Zhang and Steklova, 2020: 1; Islam et al., 2020: 121; Wu et al., 2024: 2). Corporate governance principles ensure that firms act not only in the interest of shareholders but also by considering all stakeholders, while also maintaining operations within a institutional structure.

The COVID-19 pandemic, officially declared by the WHO in March 2020, led governments to implement strict restrictions. While these restrictions negatively affected people's social lives, they also caused financial difficulties in many sectors (Aydoğan, 2022: 136). During this period, financial problems became a major concern, especially for firms that were financially fragile and had debt-heavy capital structures (Ferrando-Ganoulis, 2020: 1).

## 2. METHODOLOGY AND VARİABLES

The sample of this study consists of firms included in the Borsa Istanbul Corporate Governance Index. To capture the changing effect of COVID-19 on the relationship between corporate governance (CG) and financial flexibility (FF), the analysis period covers seven years, from 2018 to 2024. Therefore, firms other than financial institutions that were listed in the index throughout this period were selected for the sample. The final sample consists of 26 firms.

The dependent and independent variables of the study are financial flexibility (FF) and corporate governance scores (CG), respectively. The control variables include investment growth, firm size, return on assets, sales growth, and the interaction term. The calculation of the variables is presented in Table 1.

**Table 1.** Description of Variables

| Variables | Measure |
|---|---|
| Financial Flexibility (FF) | Financial flexibility = Cash flexibility + Liability flexibility<br>Cash flexibility = (Corporate cash holdings - average industry cash holdings)<br>Liability flexibility = Max (0, average industry debt ratio- corporate debt ratio) |
| Investment Growth (IG) | $IG = \frac{(\text{Tangible Asset}+\text{Intangible Asset})_t-(\text{Tangible Asset}+\text{Intangible Asset})_{t-1}}{(\text{Tangible Asset}+\text{Intangible Asset})_{t-1}} * 100$ |
| Sales Growth (SG) | $SG = \frac{(\text{Sales})_t-(\text{Sales})_{t-1}}{(\text{Sales})_{t-1}} * 100$ |

| | |
|---|---|
| Firm Size | Natural logarithm of total assets |
| Return on Asset (ROA) | $\text{ROA} = \frac{\text{Net Profit}}{\text{Total Assets}}$ |
| Corporate Governance (CG) | Corporate governance scores of firms |
| Covid-19 Dummy (C) | The dummy variable was created by giving a value of 1 for 2020 and 2021 and a value of 0 for the other years. |
| Interaction Term (CGxC) | The interaction term was constructed by multiplying the CG with C representing the COVID-19 period, in order to capture the moderating effect of the pandemic. |

**Note:** The formula for Financial Flexibility (FF) is adapted from Zhang, Zhang and Steklova, 2020.

The analysis method of the study is static panel data analysis with fixed effects. The model of the study is as below:

$$FF_{it} = \beta_0 + \beta_1 CG_{it} + \beta_2 IG_{it} + \beta_3 Size_{it} + \beta_4 ROA_{it} + \beta_5 SG_{it} + \beta_6 (CGxC)_{it} + \mu_i + \gamma_t + \varepsilon_{it}$$

Here; $FF_{it}$ represents financial flexibility; $CG_{it}$ represent corporate governance scores; $IG_{it}$ investment growth rate; $Size_{it}$ represents firm size; $ROA_{it}$ represents returns on assets; $SGit$ represents sales growth rate; $(CGxC)_{it}$represent interaction term; $\mu_i$ denotes firm fixed effects; $\gamma_t$ denotes time fixed effect for unobserved heterogeneity across firms and time-specific shocks.

In order to determine whether the model has to be estimated by Pooled OLS or random effect, the Extended Breusch–Pagan LM Test was first applied *(*Breusch-Pagan, 1980*)*. The results indicated that the Pooled OLS model was appropriate. However, the presence of autocorrelation (AC) was also detected in the model. And in the presence of autocorrelation, statistical results based on Pooled OLS become unreliable due to biased standard errors. Therefore, to determine whether the fixed effects or random effects model was more suitable, a cluster-robust version of the Hausman test, which is robust to both heteroskedasticity (HC) and autocorrelation, was conducted (Hausman, 1978). The test result was statistically significant ($\chi^2(6) = 23.13$, $p < 0.01$), indicating that the random effects model is biased and that the fixed effects model is more appropriate for the analysis. After selecting the appropriate model, tests for autocorrelation (AC), heteroskedasticity (HC), and cross-sectional dependence (CD) were conducted. The heteroskedasticity-robust autocorrelation test proposed by Born and Breitung (2016) indicated the presence of first-order autocorrelation in the model. According to the results of the Likelihood-Ratio Test, the null hypothesis of homoskedasticity was rejected at the 1% significance level, confirming the presence of heteroskedasticity *(*Gujarati-Porter, 2003*)*. Finally, the Pesaran CD Test (2004*)* revealed significant cross-sectional dependence among the panel units. To address the presence of AC, HC and CD in the panel data, the fixed effects model was estimated using Driscoll–Kraay robust standard errors *(*Driscoll-Kraay, 1998*)*. Table 4 presents the result of the analysis.

## 3. FINDINGS

The descriptive statictics results of variables in the sample period are present in Table 1 as below.

**Table 2.** Descriptive Statistics

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| FF | 182 | 3.22 | 5.83 | -0.12 | 19.11 |
| IG | 182 | 68.73 | 126.94 | -99.66 | 714.53 |
| Size | 182 | 10.22 | 0.89 | 8.44 | 12.43 |
| ROA | 182 | 0.064 | 0.088 | -0.238 | 0.378 |
| SG | 182 | 73.5 | 185.22 | -99.8 | 2276.72 |
| CG | 182 | 94.32 | 2.55 | 83.75 | 97.9 |
| CGxC | 182 | 26.94 | 42.73 | 0 | 97.49 |

According to the descriptive statistics table, the standard deviations of investment growth (IG) and sales growth (SG) are considerably high. This indicates that the firms in the sample differ significantly in terms of their sales and investment growth levels.

Table 2 shows the Pearson correlation coefficients between the variables.

**Table 3.** Correlation Coeffiecients

| | FF | IG | Size | ROA | SG | CG | CGxC |
|---|---|---|---|---|---|---|---|
| FF | 1 | | | | | | |
| IG | -0.1841 | 1 | | | | | |
| Size | 0.1621 | 0.1966 | 1 | | | | |
| ROA | 0.0059 | 0.1575 | 0.1287 | 1 | | | |
| SG | -0.0674 | 0.2959 | -0.0485 | 0.0843 | 1 | | |
| CG | -0.1176 | 0.0907 | 0.4315 | -0.0412 | -0.0976 | 1 | |
| CGxC | 0.6401 | -0.1706 | -0.1173 | 0.0505 | -0.0965 | 0.0086 | 1 |

According to the correlation table, the variable most strongly associated with financial flexibility is the interaction term. This suggests that firms with a high level of corporate governance may have increased their financial flexibility during the Covid-19 period.

Table 3 presents the results of fixed effect panel data model and variance inflation factor test.

**Table 4.** Fixed Effect Panel Regression Estimates for FF

| Variables | Coefficients | Driscoll-Kraay Std. Err. | VIF |
|---|---|---|---|
| CG | -0.2314 | 0.1796 | 1.26 |
| IG | 0.0012** | 0.0004 | 1.19 |
| SG | 0.0003* | 0.0000 | 1.13 |
| Size | 0.0493* | 0.2026 | 1.32 |
| ROA | 3.4268** | 0.9315 | 1.06 |
| CGxC | -0.2219** | 0.0631 | 1.06 |
| 2019 | 0.9489* | 0.1548 | |
| 2020 | 37.108* | 5.9334 | |
| 2021 | 21.554** | 6.0100 | |
| 2022 | -0.1183 | 3.2442 | |
| 2023 | -0.5581 | 3.8630 | |
| 2024 | -0.1442 | 0.5549 | |
| _cons | 21.754 | 18.300 | |
| $R^2$-within | 0.9587 | - | |
| Overall F-test (Driscoll-Kraay) | F(12,6)=1956.96* | | |
| HC (Likelihood-Ratio) | $\chi^2$(25)=220.75* | | |
| AC (Born and Breitung HR test) | -10.21* | | |
| CD (Pesaran CD test) | 42.35* | | |
| Fixed Effects F-test | F(25,144)=2.86* | | |
| Time Fixed Effects F-test | F(6,144)=299.09* | | |

*: %1 significance, **: %5 significance.

According to the VIF test results, all the variables are below five. In another word, multicollinearity is not present among the variables (Islam, 2023: 20, as cited in Gujarati-Porter, 2003). First, it was found that FF is positively effected by SG and size at the 1% significance level and IG, ROA at the 5% significance level. The impacts of IG and SG are relatively small, while the effect of firm size is modest. The effect was much higher for ROA. Accordingly, a one-unit increase in the ROA increases the FF by 3.42 units. The interaction term captures whether the corporate governance practices effect financial flexibility during Covid-19 crisis. The variables effect is negative at the 5% significance level. In another word, during Covid-19 times, a one-unit increase in the corporate governance scores reduces the financial flexibility by 0.22 units. When examining the time fixed effects, the years 2019, 2020, and 2021 are statistically significant, whereas 2022, 2023, and 2024 are not. The year 2018 serves as the reference year in the model. In 2019, firms with good governance improved their financial flexibility levels compared to 2018. However, the most significant improvement occurred during the COVID-19 period. Specifically, in 2020 and 2021, firms increased their financial flexibility by approximately 37 and 21 units, respectively, relative to 2018. As markets stabilized, firms' financial flexibility levels returned to values comparable to those in 2018. In other words, in the post-COVID period, the changes in financial flexibility are not statistically significant.

## 4. CONCLUSION

The aim of this study is to analyze the relationship between corporate governance ratings and financial flexibility and to reveal how this relationship has changed during the COVID-19 period. In line with this objective, the findings obtained from the analysis indicate that financial flexibility is positively affected by sales growth, firm size, investment growth, and return on assets. While the effects of investment and sales growth are relatively small, firm size effects are modest. The most prominent positive effect, however, result from return on assets. Secondly, although the direct effect of corporate governance scores on financial flexibility is negative, it is not statistically significant. However, the interaction term for the pandemic period is found to be negative and statistically significant. Thirdly, the time effects reveal that firms significantly increased their financial flexibility in 2020 and 2021—the years reflecting the COVID-19 period—compared to the reference year 2018. This suggests that firms adopted strategies to strengthen their financial structure during the pandemic. In addition, the effective use of assets appears to strengthen firms' cash positions and reduce their leverage, thereby supporting financial flexibility. The results also show that corporate governance practices do not have a direct effect on financial flexibility during periods of economic STABILITY, BUT THEIR IMPACT TURNS NEGATIVE DURING CRISIS PERIODS.

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