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Sustainable Finance And Investment Efficiency: A Literature Review

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Abstract

The review addresses significant research gaps by examining the impact of corporate social responsibility (CSR) practices and environmental, social, and governance (ESG) disclosures on investment outcomes. It investigates the mediating role of optimal investment in linking business sustainability performance to corporate financial performance, and the influence of corporate governance characteristics, such as CEO duality, on investment efficiency. The study systematically reviews literature from 2020 to 2024, utilizing sources from the Scopus database, and identifies key themes and trends. Findings indicate that integrating sustainable finance principles, including ESG performance metrics and green financial practices, can enhance investment efficiency, reduce financial constraints, and promote transparency. The study highlights the significance of robust governance frameworks and investor trust in achieving sustainable financial practices and improving financial performance, particularly in emerging markets. This review contributes valuable insights for policymakers, investors, and corporate managers aiming to enhance investment efficiency through sustainable practices.

Keyword: Sustainable Finance, Investment efficiency

1. INTRODUCTION

Based on the concept of World Bank, sustainable finance refers to decision-making process that takes environmental, social and governance (ESG) into account when making investment decisions, leading to increase long-term investment in sustainable economic activities. Exploring the relationship between sustainable finance and investment efficiency is essential for understanding corporate performance and financial sustainability. Research show that integrating sustainable practices into financial strategies can enhance corporate financial performance and increase firm value (Ahmed et al., 2020). Research also underscores the positive effects of ESG disclosure on transparency, information symmetry, and investment efficiency, underlining the significance of sustainable financial practices for optimal investment decisions (Ellili, 2022). Understanding the determinants of investment efficiency not only the investment community but also helps policymakers in creating a favorable environment for sustainable investments, particularly in emerging markets (Zamir et al., 2020). With investigating the link between sustainable finance and investment efficiency,

researchers provide to a better comprehension of how businesses can align financial strategies with environmental goals, thereby fostering long-term financial viability and ethical business practices.

The systematic literature review addresses research gaps within the intersection of sustainable finance and investment efficiency, focusing on corporate governance characteristics, sustainable finance, and investor trust. Previous researches have shown the positive impact of ESG disclosure on investment efficiency, emphasizing the need for further exploration into how corporate social responsibility practices influence investment decisions and financial outcomes (Hai et al., 2022). Although there is evidence of a positive relationship between business sustainability performance and corporate financial performance, there remains a gap in understanding the mediating role of optimal investment in this relationship (Poursoleyman et al., 2023). Additionally, the impact of corporate governance characteristics, such as CEO duality, on investment efficiency presents an area for investigation to determine how governance structures impact firms' investment decisions and financial performance (Nuanpradit, 2024). Furthermore, the influence of corporate social responsibility disclosures on investment efficiency in emerging markets underscores the importance of transparency and stakeholder trust can enhance investment decisions and financial result (Zamir et al., 2022). This systematic literature review aims to provide a comprehensive understanding of how sustainable finance practices, corporate governance characteristics, and investor trust intersect to shape investment efficiency and financial performance in diverse organizational contexts.

The Systematic Literature Review (SLR) titled "Exploring the Intersection of Sustainable Finance and Investment Efficiency" aims to bridge research gaps and provide a comprehensive synthesis of the current state of knowledge in this field. By systematically reviewing and analyzing relevant literature, the SLR seeks to consolidate findings to offer a holistic understanding of how sustainable finance practices intersect with investment efficiency. This approach identifies of key themes, trends, and inconsistencies in the literature, enabling researchers to draw meaningful conclusions and propose future research directions. The SLR aims to shed light on the impact of corporate governance characteristics, sustainable finance strategies, and investor trust on investment efficiency, thereby contributing to the advancement of knowledge in the areas of finance, sustainability, and corporate governance (Hai et al., 2022; Fang et al., 2023; Gao & Yu, 2020; Harymawan et al., 2022; Kwon et al., 2023).

Through this systematic review, researchers can critically evaluate the existing body of literature, identify gaps in knowledge, and provide valuable insights for academics,

practitioners, and policymakers interested in enhancing investment efficiency through sustainable financial practices.

The fundamental research question of this study is: How do sustainable finance practices, corporate governance characteristics, and investor trust intersect to influence investment efficiency and financial performance in diverse organizational contexts? To address the problem, this study has three key objectives. First, it seeks to examine the impact of corporate social responsibility (CSR) practices and ESG disclosures on investment efficiency and financial outcomes, building on findings that highlight their positive effects. Then, it aims to investigate the mediating role of optimal investment in the relationship between business sustainability performance and corporate financial performance, filling a gap in understanding how sustainability translates to financial gains. Lastly, it examines the influence of corporate governance characteristics, such as CEO duality, on investment efficiency and financial performance, focusing on how governance structures affect financial decisions and outcomes, particularly in emerging markets where transparency and stakeholder trust are critical. These objectives strive to provide a comprehensive understanding of the interplay between sustainable finance, corporate governance, and investment efficiency.

This study's contribution lies in its comprehensive analysis of how sustainable finance practices, corporate governance characteristics, and investor trust intersect to influence investment efficiency and financial performance. By systematically reviewing the literature, the research illuminates the positive impact of corporate social responsibility (CSR) practices and ESG disclosures on investment outcomes, the mediating role of optimal investment in linking sustainability performance to financial success, and the effect of corporate governance structures, such as CEO duality, on investment decisions and efficiency. This research addresses critical gaps in understanding these dynamics, particularly in emerging markets, offering valuable insights for policymakers, investors, and corporate managers aiming to enhance investment efficiency through sustainable practices and robust governance frameworks.

The scope of this study includes a systematic literature review that focuses on the intersection of sustainable finance and investment efficiency. It examines the influence corporate social responsibility (CSR) practices, ESG disclosures, and corporate governance characteristics influence investment decisions and financial performance. Additionally, the research investigates the mediating role of optimal investment in the relationship between sustainability performance and financial outcomes. It also explores the impact of corporate

governance structures, such as CEO duality, on investment efficiency, with a particular focus on transparency and stakeholder trust in emerging markets. Through this comprehensive review, the study aims to provide a holistic understanding of how sustainable finance practices and governance frameworks can enhance investment efficiency across diverse organizational contexts.

2. LITERATURE REVIEW

In exploring the relationship between sustainable finance and investment efficiency, several key concepts emerge from the literature. ESG disclosure, where companies provide information on their environmental, social, and governance performance, plays a pivotal role in enhancing transparency and reducing information asymmetry, which in turn promotes investment efficiency (Hai et al., 2022). Investment efficiency, which assesses the effectiveness of resource allocation in generating returns, is critical for optimizing value creation and financial performance within organizations (Poursoleyman et al., 2022).

Sustainable finance is a broad idea that combines environmental, social, and governance (ESG) standards into financial decision-making. This strategy seeks to promote economic development while making sure that social fairness and environmental health are valued. The term sustainable finance includes different systems and methods that connect financial actions with the Sustainable Development Goals (SDGs) and the Paris Agreement on Climate Change, thus tackling the urgent issues of climate change and inequality (Zioło et al., 2020; Budiasa, 2020; Streimikiene, 2023).

Sustainable finance integrates ESG criteria into financial decision-making processes, aiming to foster sustainable development by considering long-term impacts on society, the environment, and the economy (Liu et al., 2022). Corporate governance, encompassing the rules and practices that guide companies, significantly influences investment decisions and financial outcomes (Khiari et al., 2024). Additionally, investor trust, reflecting confidence in a company's alignment with shareholders' interests, is vital for maintaining strong investor relations and attracting investments (Zamir et al., 2020), while CEO duality, where the roles of CEO and chairman are held by the same individual, can also impact investment decisions and financial performance (Gao & Yu, 2018).

In the realm of sustainable finance, the effectiveness of investments is associated with the strategic allocation of capital towards initiatives that yield both economic returns and societal advantages. The ability to maintain financial flexibility is essential for enhancing investment effectiveness, particularly for organizations navigating market volatility (Sun,

2023). By preserving this flexibility, companies can respond to market dynamics and allocate resources to sustainable technologies that align with their long-term objectives (Klynovyi, 2023). Furthermore, the implementation of sustainable finance strategies contributes to the reduction of risks associated with climate change and social unrest, thereby enhancing overall investment outcomes (Pyka & Nocoń, 2021; Rani, 2023).

Financial reporting quality, indicating the accuracy and reliability of financial statements, is essential for providing stakeholders with dependable information for investment decision-making (Kuzey et al., 2023). Overinvestment and underinvestment is a situations where companies invest excessively or inadequately, respectively, affecting resource allocation and financial outcomes (Ding et al., 2018). The tax burden, representing total taxes paid relative to income, influences corporate investment decisions and efficiency (Li et al., 2023). These core concepts support the understanding of how sustainable finance practices intersect with investment efficiency, underscoring the significance of governance, transparency, and strategic decision-making in driving financial performance and sustainability.

The systematic literature review on the intersection of sustainable finance and investment efficiency delves various key concepts. It identifies ESG disclosure is highlighted as crucial for enhancing transparency, mitigating information asymmetry, and improving investment efficiency (Hammami & Hendijani Zadeh, 2020). Investment efficiency is a highlighted as a vital metric reflecting the effectiveness of resource allocation in generating returns and optimizing financial performance (Poursoleyman et al., 2022). Sustainable finance integrates ESG criteria into financial decision-making to promote sustainable development by considering long-term impacts on society, the environment, and the economy (Lind et al., 2020).

Corporate governance significantly influences investment decisions and financial outcomes (Rustam & Chengxuan, 2023). Investor trust is crucial for robust investor relations and attracting investments (Tian & Qi, 2023). CEO duality can affect investment decisions and financial performance in firms (Zhang et al., 2022). Financial reporting quality is essential for providing stakeholders with reliable information for decision-making (Owen & Mason, 2019). Overinvestment and underinvestment impact resource allocation and financial outcomes (Yu et al., 2023). The tax burden also influences corporate investment decisions and efficiency (Nuanpradit, 2024). These concepts shape the understanding of how sustainable finance practices intersect with investment efficiency, emphasizing the significance of governance,

transparency, and strategic decision-making in driving financial performance and sustainability.

Supporting arguments for the relationship between sustainable finance and investment efficiency highlight the critical role of ESG disclosure, business sustainability, and corporate investment strategies. Research by Ellili (2022) shows that ESG disclosure significantly enhances investment efficiency by promoting transparency and reducing information asymmetry, which leads to more accurate capital allocation decisions, lowers the cost of capital, and improves overall investment efficiency. Zamir et al. (2020) found that corporate social responsibility (CSR) disclosures positively impact investment efficiency in emerging markets, with firms adhering to ESG reporting requirements experiencing reduced investment inefficiency. This suggests that CSR practices can play a crucial role in enhancing investment efficiency. Additionally, Ahmed et al. (2020) emphasize the importance of efficient fund allocation by corporate managers, demonstrating that effective investment strategies lead to sustainable financial performance and increased firm value, underscoring the significance of investment efficiency in driving overall corporate success.

On the other hand, contrasting arguments bring attention to the potential challenges and complexities associated with achieving investment efficiency. Hai et al. (2022) argue that a lack of awareness and expertise in personal investment decisions can decrease investment efficiency, as inadequate knowledge may lead to poor investment choices and limit the range of available investment options. Furthermore, (Chasiotis et al., 2024a)discuss the impact of tax burdens, suggesting that high taxes can hinder investment efficiency and financial performance by creating financing constraints, whereas reducing the tax burden can improve corporate investment efficiency by discouraging inefficient investments.

Lastly, Harymawan et al. (2022) emphasize the role of venture capital policies, noting that effective policies are crucial for promoting entrepreneurship and investment development. Inadequate policies or the presence of moral hazard in public venture capital initiatives may negatively affect investment efficiency and economic growth in specific industries. By examining these supporting and contrasting arguments, a nuanced understanding of the diverse factors influencing the intersection of sustainable finance and investment efficiency is achieved, providing valuable insights into financial decision-making and performance.

Expanding on these consepts, the research gaps aims to address several critical research gaps identified within this intersection. First, the study will explore into the impact of ESG disclosure on investment efficiency, recognizing the need for further exploration into

how corporate social responsibility practices influence investment decisions and financial outcomes, as highlighted by Hai et al. (2022). Second, while existing research shows a positive association between business sustainability performance and corporate financial performance, there remains a gap in understanding the mediating role of optimal investment in this relationship, a gap you aim to bridge (Poursoleyman et al., 2022). Third the study will investigate the influence of corporate governance characteristics on investment efficiency, particularly in relation to CEO duality, is an area that requires deeper investigation to comprehend how governance structures impact firms' investment decisions and financial performance, as noted by Nuanpradit (2024). Additionally, the research will address the influence of CSR disclosures on investment efficiency in emerging markets, recognizing the importance of examining how transparency and stakeholder trust can enhance investment decisions and financial outcomes in these contexts (Zamir et al., 2020). Through a systematic literature review, the study seeks to provide a comprehensive understanding of how sustainable finance practices, corporate governance characteristics, and investor trust intersect to shape investment efficiency and financial performance across diverse organizational contexts, thereby contributing significantly to the existing body of knowledge in this field.

2. METHOD

The systematic review protocol for "Exploring the Intersection of Sustainable Finance and Investment Efficiency" involved a extensive analysis of existing literature to examine the relationship between sustainable finance and investment efficiency. The review protocol, following a structured guidelined outlined by (Plotnikova, 2019), systematically collect and analyze information from relevant studies on the emerging topic. Similar reviews, such as by Talan & Sharma (2019) gathred insights on sustainable investment, emphasizing the importance of this method for exploring new research areas. Cunha et al. (2021) emphasized on sustainable finance and investment, highlighting the need to review specific topics such as financial performance in sustainable investments.

This research systematically examined previous scholarly works and identified potential research areas. A keyword search was performed to find relevant article, including titles, abstracts, and keywords. The selection criteria were aimed to include all potentially relevant scholarly articles for the review. This procedure facilitates the exploration of the current knowledge base and highlights areas with potential for future reasearch.

("Sustainable finance" OR "ESG" OR "Finance" OR "Green finance" OR "Responsible finance" OR "sustainability finance" OR "sustainable") AND ("Investment Efficiency" OR

"Effective investment" OR "Optimal investment" OR "Productive investment" OR "Profitable investment")

Initially with this keyword, the search query produced 1018 documents from Scopus. But the search protocol was limited to article written in English and published between 2020 and 2024. Therefore, the documents that the search query produced to 455 documents from Scopus. To maintain the quality and relevance of the publications, only article indexed in Scopus were chosen. The number of articles was then methodically reduced by focusing on Economics, econometrics, and finance; Business, management and accounting, environmental science. This filter reduced the total number of publications to 294 documents. Articles that were unrelated or redundant were excluded based on the titles, keyword, and abstracts. Then, the number of publications was reduced to 247 with filter document type and journal type. Lastly, language filtering reduced the total number of publications to 232. This 232 documents were selected for final analysis.

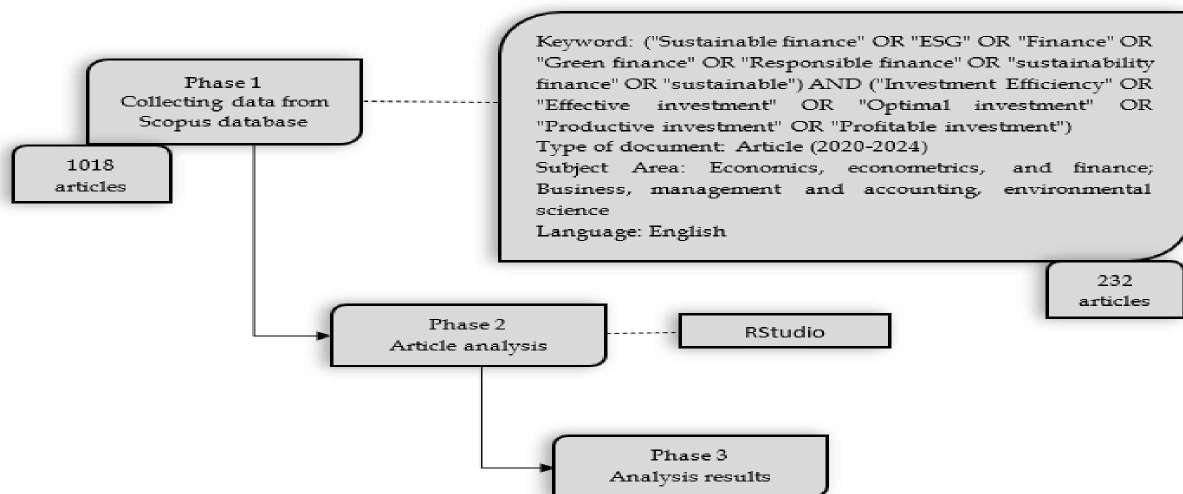

Fig 1. Research protocols of the systematic literature review

3. RESULTS

Citation analysis provides the structural characteristics and enables authors to analyze extensive literature to identify trends in the number of publications produced per year. This analysis also helps to identify the most prolific authors and journals in the given area of research, and the papers that have received the highest number of citations per year. To carry out this analysis, the current study uses R-language in Bibliometrics (a statistical tool) for citation analysis.

Average article citations per year

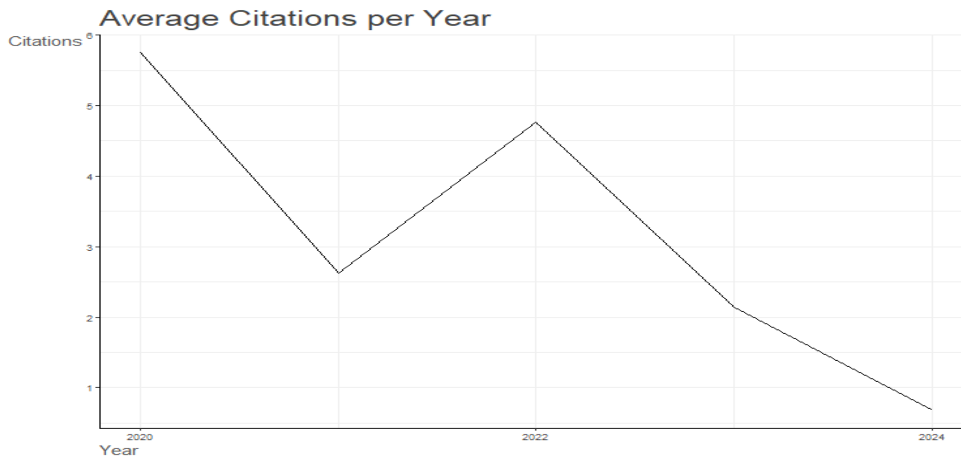

Fig 2. Average article citations per year

The fig 2 presents data on article publications from 2020 to 2024, detailing the mean total citations per article (MeanTCperArt), the number of articles (N), the mean total citations per year (MeanTCperYear), and the citable years. In 2020, there were 33 articles with a high mean total citations per article of 28.76 and a mean total citations per year of 5.75 over five citable years. The subsequent year, 2021, saw a slight decrease in articles to 31, with a notable drop in mean total citations per article to 10.48 and mean total citations per year to 2.62 across four citable years. In 2022, the number of articles increased to 40, with an improved mean total citations per article of 14.28 and a mean total citations per year of 4.76, spanning three citable years. The year 2023 experienced a significant surge in article publications to 81, but the mean total citations per article dropped to 4.28, with a mean total citations per year of 2.14 over two citable years. Finally, in 2024, 47 articles were published, but both the mean total citations per article and mean total citations per year declined sharply to 0.68, with only one citable year. This data indicates a trend of increasing publication numbers over the years, but a fluctuating pattern in citation impact, with a noticeable decline in citation metrics in the most recent years.

Most Relevant Sources

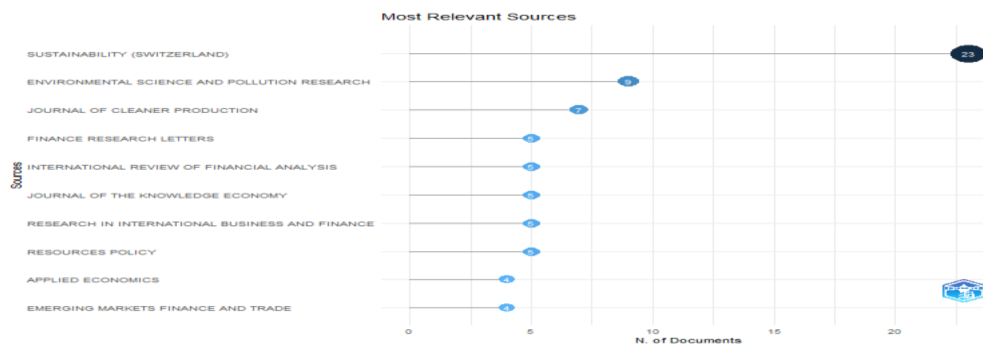

Fig 3. Most relevant Sources

The fig 3 lists various academic journals and the number of articles they have published. "Sustainability (Switzerland)" is the leading source with 23 articles, highlighting its significant contribution to the field. Following this, "Environmental Science and Pollution Research" has published 9 articles, indicating its active role in addressing environmental issues. The "Journal of Cleaner Production" comes next with 7 articles, focusing on sustainable production practices. Several journals have published 5 articles each, including "Finance Research Letters," "International Review of Financial Analysis," "Journal of the Knowledge Economy," "Research in International Business and Finance," and "Resources Policy,"

showcasing a diverse range of topics from finance to business and economic policies. "Applied Economics" and "Emerging Markets Finance and Trade" each have 4 articles, contributing to the fields of economics and emerging market studies, respectively. This data reflects a broad spectrum of research interests and outputs across different areas of sustainability, finance, economics, and environmental science. The variation in the number of articles published by each source indicates differing levels of focus and expertise, with some journals like "Sustainability (Switzerland)" leading in volume, possibly due to its broader scope or higher submission rates.

Authors' productivity and the impact of the most influential authors

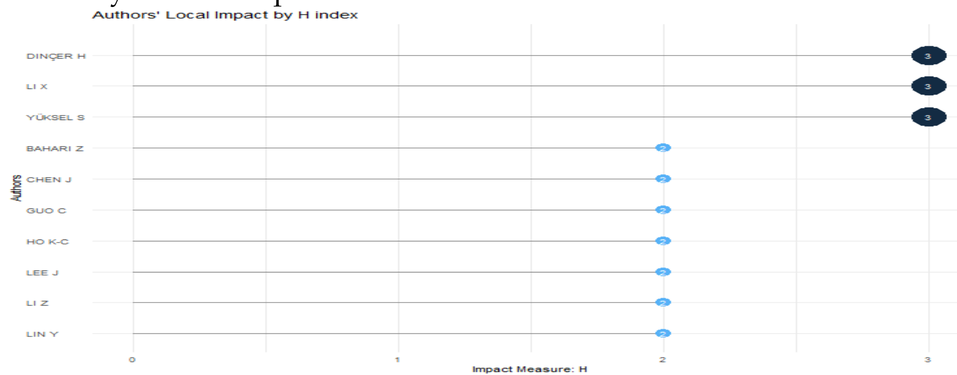

Fig 4. Author impact

The fig 4 provides detailed metrics for various authors, showcasing their h-index, g-index, m-index, total citations (TC), number of publications (NP), and the start year of their publication period (PY_start). DINÇER H, LI X, and YÜKSEL S each have an h-index of 3 and an m-index of 0.6, indicating a balanced and significant impact in their research fields. DINÇER H and YÜKSEL S both have a total citation count of 118 from 3 publications starting in 2020, while LI X has 102 citations from 4 publications within the same year. BAHARI Z has an h-index and g-index of 2 with a lower m-index of 0.4, accumulating 19 citations from 2 publications starting in 2020. CHEN J, with a start year of 2021, has an h-index of 2 and a g-index of 3, achieving 14 citations from 3 publications. GUO C and HO K-C, both starting in 2022, have an m-index of approximately 0.67, reflecting a rapid accumulation of impact; GUO C has 23 citations from 3 publications, while HO K-C has 47 citations from 2 publications. LEE J, starting in 2020, has an h-index of 2 and a g-index of 2, with 16 citations from 2 publications. Similarly, LI Z, starting in 2022, has achieved 21 citations from 3 publications with a similar m-index. Lastly, LIN Y, with a start year of 2023, has an h-index and g-index of 2 and a notably high m-index of 1, with 20 citations from 2 publications. This data indicates the productivity and citation impact of these authors over their respective publication periods, highlighting their contributions to their fields.

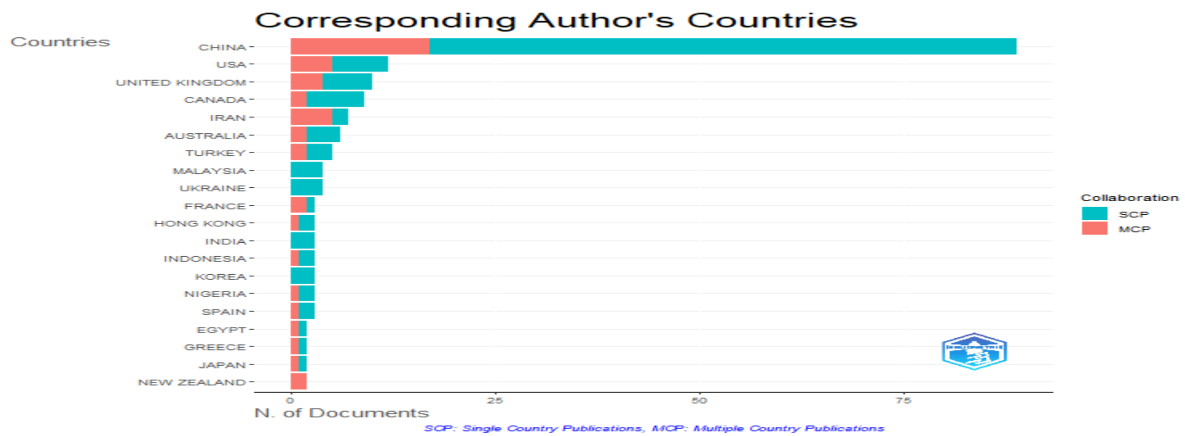

Fig 5. Distribution of articles by country

The fig 5 illustrates the distribution of articles by country, highlighting China as the dominant contributor with 89 articles, accounting for 38.36% of the total, with 72 being single-country publications (SCP) and 17 multi-country publications (MCP), indicating a strong national research output with some international collaboration. The USA follows with 12 articles, 7 SCP, and 5 MCP, representing 5.17% of the total, and a higher MCP percentage of 41.67%, suggesting significant international collaboration. The United Kingdom, Canada, and Iran also show notable contributions with varying degrees of international collaboration, reflected in their MCP percentages. Countries like Malaysia, Ukraine, India, Korea, and Nigeria predominantly publish SCPs, indicating a focus on national research efforts. In contrast, countries like France, Iran, and New Zealand exhibit higher MCP percentages, highlighting their collaborative international research efforts. This distribution reflects global research dynamics, with varying emphasis on national versus international collaborations, and correlates with previous data showing productivity and citation impacts, indicating the importance of both volume and collaborative reach in enhancing research impact.

Conceptual structures

Conceptual structure concentrates on the main themes of a particular research field. This is based on the authors supplied keywords, keyword plus (most frequently used words from a reference list), and the phrases that appear in the title and/or abstracts of the selected sample of articles. Therefore, keyword analysis aims at discovering the overall themes of scientific research, and to show the importance of different conceptual structures.

Fig 6. Word cloud of the investigated relationship

The word cloud in the image emphasizes key terms related to sustainable finance and investment efficiency. The most prominent words include "sustainable development," "investment," "China," and "investments," indicating their central role in discussions within this domain. Other significant terms like "decision making," "economic development," "finance," "efficiency," and "corporate strategy" suggest a focus on how investments can drive sustainable growth. The presence of "China" highlights the country's significant involvement and impact on sustainable finance and investment practices. Terms such as "economic

growth," "policy," "corporate social responsibility," and "investment efficiency" further underline the interconnectedness of financial decisions and sustainable outcomes. The word cloud visually represents the primary themes and topics that are crucial in the field, showcasing the importance of integrating sustainability into investment strategies to achieve long-term economic and environmental benefits. This visualization aligns with the broader narrative of promoting responsible inves.

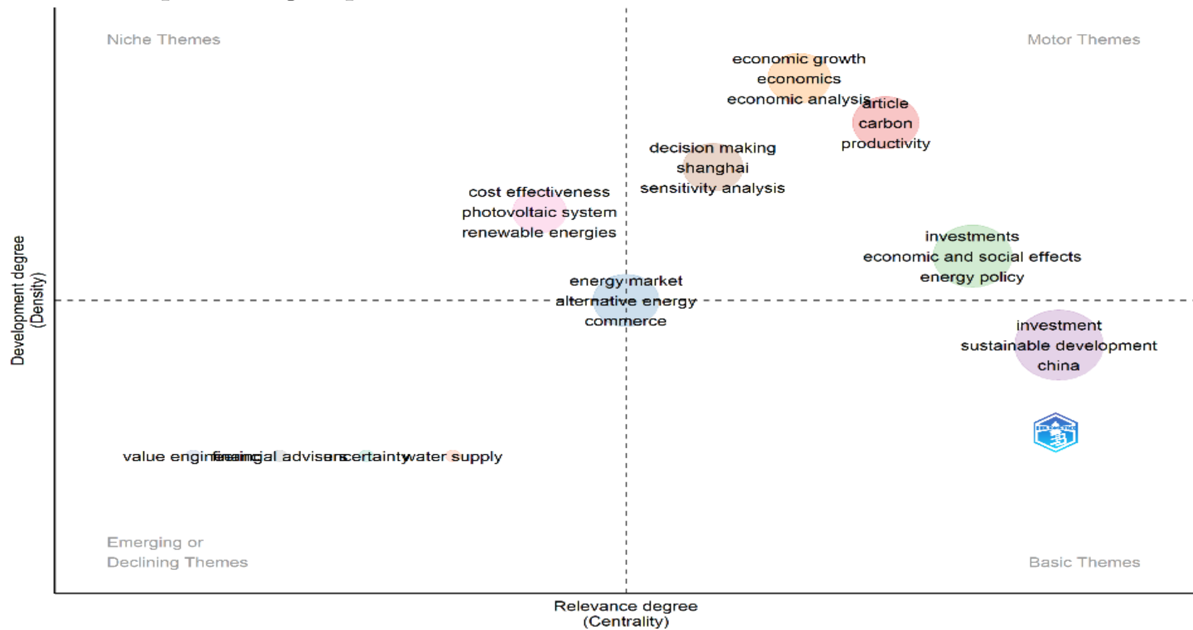

Fig 7. Thematic Map

The thematic map visually categorizes research topics based on their development degree (density) and relevance degree (centrality). In the top-right quadrant (Motor Themes), highly developed and central topics like "economic growth," "economics," and "productivity" indicate areas of strong influence and research activity. The bottom-right quadrant (Basic Themes) includes essential but less developed topics such as "investment," "sustainable development," and "China," which are foundational to the field. The top-left quadrant (Niche Themes) includes specialized topics like "cost effectiveness" and "photovoltaic system," which are well-developed but less central. The bottom-left quadrant (Emerging or Declining Themes) features less developed and less central topics such as "value engineering" and "financial advisors," indicating potential areas for future research or topics losing relevance. This map provides a comprehensive overview of the current state and focus areas in sustainable finance and investment efficiency research.

Fig 8. Co_occurrence Network

The network visualization showcases the interconnections between various research topics related to sustainable finance and investment efficiency. Central themes like "investments," "sustainable development," and "investment" are prominent, indicating their critical role in this research domain. Green nodes represent topics closely linked to policy-making, corporate strategy, and efficiency, highlighting their relevance in achieving sustainable financial practices. Blue nodes, connected to terms like "economic analysis," "energy market," and "carbon emission," suggest a focus on the environmental and economic impacts of investments. Red nodes, associated with "cost effectiveness," "profitability," and "sales," emphasize the financial performance aspects. The dense web of connections between these nodes illustrates the multidisciplinary nature of research in sustainable finance, integrating economic, environmental, and policy perspectives to promote investment efficiency and sustainable development goals.

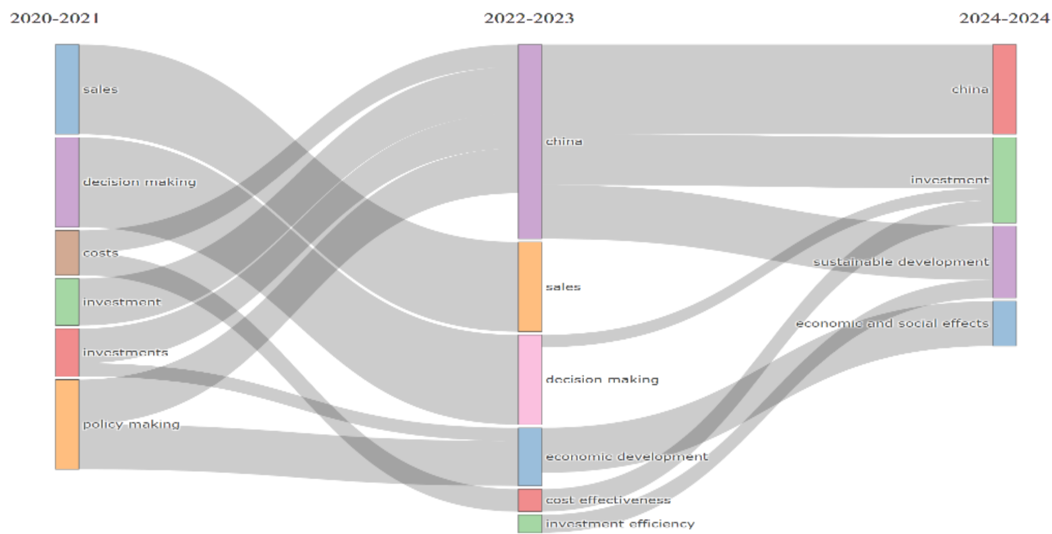

Fig 9. Thematic Evolution

The thematic evolution map visualizes the progression and interconnection of research themes in sustainable finance and investment efficiency from 2020 to 2024. During 2020-2021, key themes included "sales," "decision making," "costs," "investment," "investments," and "policy making." These themes evolved in the 2022-2023 period to focus more on "China," "sales," "decision making," "economic development," "cost effectiveness," and "investment efficiency." By 2024, the research themes shifted again, emphasizing "China," "investment," "sustainable development," and "economic and social effects." This visualization demonstrates how certain core themes persist while others emerge or decline, reflecting the dynamic nature of research priorities. The continued prominence of "investment" and the increasing focus on "China" and "sustainable development" indicate the growing importance of integrating environmental and social considerations into financial decision-making processes.

Co-Citation Networks

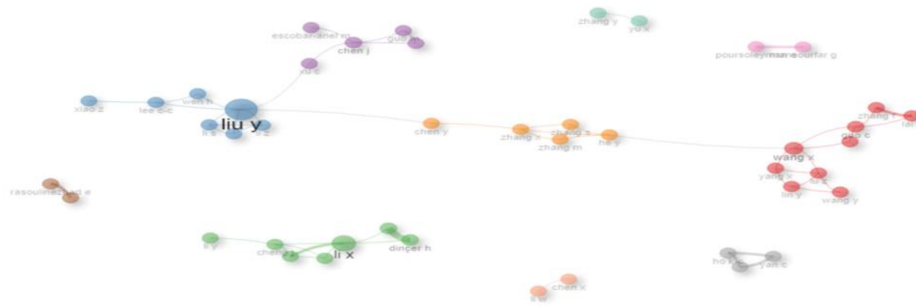

Fig 10. Co_citation Network

The network visualization illustrates the citation relationships among various authors in the field of sustainable finance and investment efficiency. The central node "liu y" is highly influential, with numerous connections indicating significant citations from other authors. Clusters of different colors represent groups of authors with closely related research topics. For instance, the blue cluster around "liu y" includes authors like "wen h" and "lee c-c," indicating a tight-knit research community. The orange cluster, featuring authors like "zhang x" and "chen y," and the red cluster with "wang x" and "guo c," suggest other focal areas within the broader research domain. Smaller, isolated clusters, such as the green group with "li y" and "dinçer h," and the purple group with "xu c" and "guo m," highlight specialized or emerging research topics. This visualization underscores the collaborative nature of research in this field and the interconnectedness of various authors and their contributions to advancing sustainable finance and investment efficiency.

4. DISCUSSION

Sustainable finance principles currently integrated into investment strategies

Sustainable finance principles are increasingly being integrated into investment strategies to optimize investment efficiency and promote eco-friendly projects. Various studies have explored the relationship between sustainable finance practices and investment efficiency across different contexts. Khiari (2023) emphasizes the importance of introducing financial instruments to enhance investment efficiency for eco-friendly projects, suggesting a proactive approach by policymakers (Khiari, 2023). investigate the positive association between environmental, social, and governance (ESG) performance and firm investment efficiency in emerging markets, highlighting the significance of ESG factors in driving efficient investments (Al-Hiyari et al., 2023; Liu et al., 2022) discuss the impact of green financial reform on corporate investment efficiency, showcasing how incorporating environmental factors into financial activities can lead to a green allocation of funds (Yan et al., 2022). Additionally, Hai et al. (2022) and (Kouaib, 2022) both demonstrate that ESG disclosure practices positively influence investment efficiency, indicating that transparency in ESG information can enhance investment decisions (Hai et al., 2022; Kouaib, 2022). Furthermore, Li et al. (2023) reveal that supply-chain finance can help alleviate under-investment and prevent over-investment, contributing to improved investment efficiency (Li et al., 2023). These findings collectively suggest that integrating sustainable finance principles, such as ESG performance metrics and green financial practices, into investment strategies can lead to more efficient and environmentally conscious investment decisions.

Impact do sustainable finance practices have on investment efficiency

Sustainable finance practices have a significant impact on investment efficiency. Research has shown that factors such as environmental, social, and governance (ESG) disclosure, financial reporting quality, green credit, and business sustainability performance

are positively associated with investment efficiency (Al-Hiyari et al., 2023; Ellili, 2022; Fang et al., 2023). ESG commitment can reduce financial constraints for firms, leading to improved investment efficiency (Al-Hiyari et al., 2022). Additionally, green credit and sustainability performance contribute to higher financial performance and investment efficiency (Zhang et al., 2022; Poursoleyman et al., 2022). Moreover, supply chain information disclosure and corporate environmental responsibility activities have been linked to enhancing investment efficiency (Gao et al., 2023; Lee & Kim, 2020). Studies have also highlighted the role of ESG performance in influencing investment efficiency, with a focus on reducing information asymmetry and promoting efficient investment allocation (Bilyay-Erdogan et al., 2024). Furthermore, the impact of corporate environmental responsibility on overinvestment behavior has been explored, emphasizing the relationship between environmental responsibility activities and investment efficiency (Lee & Kim, 2020). It has been suggested that a strong ESG record can reduce financial constraints, improve the information environment, and subsequently enhance labor investment efficiency (Li et al., 2023). In conclusion, sustainable finance practices play a crucial role in improving investment efficiency by reducing financial constraints, enhancing information transparency, and promoting responsible investment allocation. Companies that prioritize ESG disclosure, green credit, sustainability performance, and environmental responsibility are likely to experience higher investment efficiency, leading to improved financial performance and long-term sustainability.

Sustainable finance lead to more efficient resource allocation and improved financial returns

Sustainable finance has garnered increasing interest due to its potential impact on resource allocation efficiency and financial returns. Several studies have delved into the relationship between sustainable finance practices, such as environmental, social, and governance (ESG) disclosure, and investment efficiency. Ellili (2022) investigated the impact of ESG disclosure and financial reporting quality on investment efficiency, underscoring the significance of transparency in shaping investment decisions. Zamir et al. (2020) focused on corporate social responsibility disclosures and their effect on investment efficiency in emerging markets, stressing the importance of comprehending factors influencing investment efficiency. Moreover, Harymawan et al. (2022) scrutinized the link between investment efficiency and ESG reporting, elucidating the role of corporate integration management in this association. These studies collectively indicate that sustainable finance practices, including ESG disclosure and corporate social responsibility, can have a positive impact on investment efficiency. By bolstering transparency, advocating for responsible business conduct, and considering environmental and social aspects in investment choices, sustainable finance has the potential to enhance resource allocation efficiency and potentially boost financial returns.

Challenges and barriers do investors face when implementing sustainable finance practices

Investors encounter various challenges and barriers when implementing sustainable finance practices, which can impede the efficient allocation of resources towards environmentally and socially responsible investments. One significant challenge is the impact of environmental, social, and governance (ESG) disclosure and financial reporting quality (FRQ) on investment efficiency (Ellili, 2022). The transparency and accuracy of ESG disclosures play a crucial role in influencing investment decisions and efficiency. Investors may face difficulties in evaluating the reliability and relevance of ESG information, which can lead to suboptimal investment choices. Moreover, corporate social responsibility (CSR) disclosures in emerging markets, such as those in Asia, can also impact investment efficiency (Zamir et al., 2020). Understanding the factors that influence investment efficiency in these

markets is crucial for investors and policymakers. However, navigating the complexities of CSR disclosures and their effect on financial performance can present challenges for investors aiming to align their investments with sustainable practices. Additionally, the life cycle of a firm can influence corporate investment efficiency (CIE) (Ahmed et al., 2020). As companies progress through different growth stages, their investment decisions may vary in terms of efficiency and sustainability. Investors need to consider the maturity and development phase of a firm to accurately assess its investment efficiency, which can be challenging due to the dynamic nature of businesses. Furthermore, the relationship between investment efficiency and environmental, social, and governance (ESG) reporting offers insights into how corporate integration management impacts investment decisions (Harymawan et al., 2022). Balancing financial performance with ESG considerations poses challenges for investors striving to achieve both profitability and sustainability goals. Integrating ESG factors into investment decisions necessitates a profound understanding of how these aspects influence investment efficiency. Moreover, the impact of green financial reforms and innovation pilot zones on corporate investment efficiency underscores the importance of incentivizing eco-friendly projects while discouraging investments in polluting activities (Yan et al., 2022). Investors may encounter challenges in navigating regulatory frameworks and market dynamics to optimize investment efficiency in alignment with green finance initiatives. ESG reputational risk can also influence the efficiency and speed of adjustment of corporate investment decisions (Chasiotis et al., 2024). Managing ESG risks and integrating them into investment strategies can be a barrier for investors aiming to enhance investment efficiency while mitigating reputational risks associated with unsustainable practices. In addition to these factors, overcoming barriers to supply chain digitization (SCD) is crucial for enhancing sustainable development goals and improving investment efficiency (Dadsena et al., 2024). Embracing digital transformation in supply chains can streamline operations and enhance transparency, but challenges such as technological adoption and financial constraints can hinder progress towards sustainable finance practices. Furthermore, the role of chief financial officers (CFOs) in optimizing investment efficiency and promoting sustainable business practices highlights the significance of leadership in aligning financial strategies with sustainability goals (Chatpibal et al., 2024). CFOs play a critical role in shaping investment decisions and overcoming barriers to achieving investment efficiency in line with sustainable development objectives.

Implementation of sustainable finance practices be improved to achieve greater investment efficiency

To enhance the application of sustainable financial practices for greater investment efficiency, several key strategies can be implemented based on insights from reputable academic articles. One crucial aspect is the consideration of environmental, social, and governance (ESG) factors in investment decisions. Research by Al-Hiyari et al. (2022) highlights that firms with strong ESG performance are more likely to secure financing, enabling them to capitalize on profitable investment opportunities. This underscores the importance of integrating ESG criteria into financial strategies to attract investment and enhance efficiency. Moreover, the study by Kouaib (2022) emphasizes the significance of corporate sustainability disclosure in improving investment efficiency. By providing transparency through ESG reporting, firms can demonstrate their commitment to sustainable practices, which can attract investors and positively impact investment decisions. This aligns with the notion that ESG reporting serves as a driver for enhanced corporate investment, as indicated by the research findings. Additionally, the research by Harymawan et al. (2022) delves into the relationship between investment efficiency and ESG reporting, shedding light on the positive impact of environmental, social, and governance integration on investment practices. By considering ESG factors in decision-making processes, firms can not only

enhance their sustainability performance but also improve their financial outcomes through more efficient investments. Furthermore, the study by Musa et al., (2020) underscores the role of Islamic capital markets in influencing the real economy. Islamic finance principles promote ethical and sustainable investment practices, which can contribute to the overall economic growth of a country. Integrating Islamic finance principles into investment strategies can foster greater efficiency and align investments with sustainable development goals. Another critical aspect to consider is the mediating role of optimal investment in the relationship between business sustainability performance and corporate financial performance, as highlighted by (Poursoleyman et al., 2022). This suggests that by focusing on sustainable business practices and optimizing investments, firms can achieve higher financial performance, indicating a positive association between sustainability efforts and financial outcomes. Moreover, the study by Ahmed et al. (2020) emphasizes the impact of firm life cycle on corporate investment efficiency. Efficient allocation of funds throughout different stages of a firm's life cycle can lead to sustainable financial performance and increased firm value. By understanding the dynamics of the firm life cycle and tailoring investment decisions accordingly, organizations can enhance their investment efficiency.

5. CONCLUSION

The conclusion of the article "Exploring the Intersection of Sustainable Finance and Investment Efficiency" highlights the significant role that sustainable finance practices play in enhancing investment efficiency. The integration of Environmental, Social, and Governance (ESG) criteria into financial strategies is crucial for attracting investments and improving financial performance. Studies show that firms with strong ESG performance are better positioned to secure financing, which in turn supports profitable investment opportunities. This indicates a positive correlation between ESG commitments and investment efficiency, as transparency and accountability in sustainability practices can drive better investment decisions and outcomes.

Moreover, the article emphasizes the importance of leadership, particularly the role of Chief Financial Officers (CFOs) in steering sustainable financial practices within organizations. By aligning financial strategies with sustainability goals, CFOs can significantly impact the efficiency of investments. The research also underscores the relevance of corporate sustainability disclosure, suggesting that transparency through ESG reporting can enhance investor confidence and attract capital. Overall, the findings suggest that sustainable finance not only promotes environmental and social responsibility but also leads to improved financial performance, highlighting the dual benefits of integrating sustainability into investment strategies.

6. LIMITATIONS

The limitations of this study encompass several key areas that could be addressed in future research. Firstly, the scope of the systematic review was confined to literature published between 2020 and 2024, which may have excluded relevant studies conducted outside this period. This temporal limitation may affect the comprehensiveness of the findings and their applicability to ongoing or evolving research trends. Secondly, the reliance on Scopus as the sole database for sourcing literature may have introduced a selection bias, as important studies indexed in other databases were not considered. Expanding the database sources could provide a more holistic view of the research landscape. Additionally, the study primarily focused on English-language publications, potentially overlooking significant contributions in other languages. This language bias could limit the generalizability of the results across different linguistic and cultural contexts. The methodological approach, while rigorous, may also have inherent biases related to the keywords and search strings used, which might have excluded pertinent studies that employed different terminologies.

Moreover, the synthesis of findings from diverse studies with varying methodologies and contexts poses a challenge in drawing definitive conclusions.

Another limitation is the potential for publication bias, as studies with significant or positive findings are more likely to be published than those with null or negative results. This could skew the overall understanding of the relationship between sustainable finance and investment efficiency. Furthermore, the study did not account for the quality of the included articles, which could vary significantly and impact the reliability of the conclusions drawn. Future research should consider incorporating quality assessment criteria to evaluate the robustness of the included studies. Finally, the study's focus on corporate governance characteristics and ESG disclosures may not fully capture other influential factors such as macroeconomic conditions, regulatory frameworks, and technological advancements that could also impact investment efficiency. Addressing these limitations in future research could enhance the robustness and applicability of the findings, providing a more comprehensive understanding of the intersection between sustainable finance and investment efficiency.

7. AVENUES FOR FUTURE RESEARCH

Avenues for future research in the intersection of sustainable finance and investment efficiency are vast and multifaceted. Firstly, future studies should explore the role of emerging technologies, such as blockchain and artificial intelligence, in enhancing investment efficiency and promoting sustainable finance practices. These technologies can potentially revolutionize financial transparency and efficiency, which warrants deeper investigation. Secondly, there is a need to examine the long-term impacts of sustainable finance on corporate financial performance in various sectors, particularly in developing economies where the adoption of ESG practices is still nascent. This will help understand the broader implications and benefits of sustainable finance. Thirdly, research should focus on the influence of cultural and regional differences on the effectiveness of sustainable finance practices, as these factors can significantly impact the implementation and success of such strategies. Furthermore, the relationship between regulatory frameworks and investment efficiency in the context of sustainable finance needs thorough exploration to identify optimal policy interventions. Additionally, investigating the psychological and behavioral aspects of investors towards sustainable investments can provide insights into promoting more environmentally and socially responsible investment decisions. Future research should also delve into the potential risks and challenges associated with the integration of sustainability criteria into financial decision-making processes

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