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An empirical study of the interplay between financial performance, sustainability performance and ESG controversies in the utilities sector

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摘要

本研究旨在探讨公用事业行业公司中 ESG 评分、ESG 争议评分与财务绩效（资产回报率和股东权益回报率）之间的相互作用。

尽管已有大量关于特定行业 ESG 的研究，但关于 ESG 绩效与财务绩效之间关系的研究在公用事业公司背景下仍较为缺乏。本研究旨在填补这一空白。另一方面，ESG 争议对公司绩效的影响是一个相对新颖且尚未深入探索的议题，该领域仍有广泛的研究空间。

本研究探讨了三个研究问题。首先，整体 ESG 评分及其各组成部分对公用事业行业公司资产回报率和股东权益回报率的影响如何？其次，ESG 争议评分对公用事业行业公司资产回报率和股东权益回报率的影响如何？最后，ESG 争议评分是否会调节整体 ESG 评分与公用事业公司财务绩效之间的关系？

本研究采用了 178 家上市公用事业公司的样本。共提出 12 个研究假设，并针对每个假设建立了专门的回归模型进行检验。所有回归分析均采用固定效应面板数据分析法进行。

研究结果呈现出不同的发现。整体 ESG 评分与资产回报率显著负相关，而与股东权益回报率的关系不显著。环境评分与资产回报率和股东权益回报率均呈显著负相关，而社会和治理评分与这两项财务指标的关系均不显著。ESG 争议评分与资产回报率和股东权益回报率的关系均不显著，且未能调节整体 ESG 评分与财务绩效之间的关系。

本研究的发现与更广泛的ESG文献中观察到的主流模式有所不同，后者大多表明ESG绩效与企业财务绩效之间存在正相关关系，并且ESG争议对企业绩效具有显著影响。尽管大多数现有研究分析的是由不同行业公司组成的样本，但本研究强调了行业特定分析的必要性，因为不同的行业特征和制度框架可能会导致不同的结果。通过对公用事业行业的

研究，这一领域迄今在ESG财务绩效研究中仍处于边缘，本研究提供了一种全新的独特视角，以探讨ESG评分和争议在高度监管行业中如何与企业财务绩效相互作用。

关键词：企业绩效，资产回报率，股东权益回报率，公用事业，ESG，争议
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ABSTRACT

This study aims to investigate the interplay between ESG scores, the ESG controversies score and financial performance (Return On Assets and Return On Equity) in companies within the utilities sector.

Despite the large number of ESG studies, very little research has been conducted so far on the link between ESG scores and financial performance in the context of utilities firms. The current study aims at filling this gap. On the other hand, the effect of ESG controversies on firm performance is a relatively new and unexplored topic, and there is significant room for further research in this area.

Three research questions have been investigated in this study: 1) What is the impact of overall and individual ESG scores on the financial performance of companies within the utilities sector? 2) What is the impact of the ESG controversies score on the financial performance of companies within the utilities sector? 3) Does the ESG controversies score moderate the relationship between the overall ESG score and utilities firms' financial performance?

To perform the research, a sample of 178 public utilities companies has been used. A total number of six hypothesis have been developed and have been tested using for each dedicated regression models with ROA and ROE as dependent variables. All the regressions have been performed employing fixed effects panel data analysis.

The results of the study reveal mixed findings. The overall ESG score is significantly and negatively related to ROA, while the relationship with ROE is non-significant. The Environmental Score has a negative and significant relationship with both ROA and ROE, while Social and Governance scores have non-significant relationships with both financial measures. The ESG controversies score has non-significant relationships with both ROA and ROE and does not moderate the relationship between the overall ESG Score and the financial measures.

The findings of this study diverge from the dominant patterns observed in the broader ESG literature, which largely indicates a positive ESG-financial performance

relationship and a significant impact of ESG controversies on firms' performance. While most of the existing studies analyzed samples formed by companies belonging to different industries, this study highlights the need for sector-specific analysis, as diverse industry characteristics and different institutional frameworks can lead to different results. By examining the utilities sector, which has remained so far at the margins of the ESG-financial performance research, this study provides a new and unique perspective on how ESG scores and controversies interact with firms' financial performance in highly regulated industries.

Keywords: Firm performance, ROA, ROE, Utilities, ESG, Controversies
CLC Number: F272

I. INTRODUCTION

The purpose of this dissertation is to investigate the relationship between ESG scores and financial performance (Return On Assets and Return On Equity) in companies within the utilities sector. Additionally, the relationship between ESG controversies score and financial performance is examined, along with the potential moderating effect of the ESG controversies score on the ESG–financial performance relationship.

The link between ESG and financial performance has been a subject of study since the 1970s (Aldag and Bartol, 1978), and it has gained significant traction in recent years, as ESG topics have become increasingly pressing and central in the global business landscape, attracting the attention of powerful institutional investors and prominent financial institutions (Larry Fink, 2017).

In the last years, many scholars focused their efforts on studying the connection between Environmental, Social, Governance factors and firm performance. Nevertheless, no consensus has been reached so far on the topic, with part of the literature evidencing the existence of a positive relationship (e.g. Wang and Sarkis, 2017; Velte, 2017; Fei Wang, 2024; Xie et al., 2019), while findings provided by other researchers revealed a negative ESG-financial performance relationship (e.g. Ruan and Liu, 2021; Cerciello et al., 2023; Chen et al, 2021; Lin et al., 2019). In addition, a third group of studies has reported mixed or neutral results (e.g. Han et al., 2016; Shakil et al., 2019; La Torre et al., 2021; Narula and al., 2024).

Interestingly, despite the large number of ESG studies, very little research has been conducted so far on the link between ESG performance and financial performance in the context of utilities firms. Most studies involving utilities companies also include non-utility energy companies more broadly. This has led to a lack of insights specific to utilities firms.

Utilities firms are important actors in today's society and have an important role in shaping its future (Bauer et al., 2023). This lack of research specifically concerning the utilities sector represents a significant gap in literature. The current study aims at filling this gap, by examining the interplay between financial and sustainability performance,

using relevant proxies for firm and ESG performance as dependent and independent variables in dedicated regression models. On the other hand, the effect of ESG controversies on firm performance is a relatively new and unexplored topic, with only a small number of studies providing insights into it (e.g. Banjade, 2024; Mendiratta et al., 2023; Melinda and Wardhani, 2020; Nirino et al., 2021). As a result, there is significant room for further research in this area. Having already highlighted the importance of utilities firms in contemporary society, it is interesting to examine how ESG controversies affect their financial performance.

To provide an in-depth overview of how ESG scores and controversies influence the performance of firms belonging to the selected industry, the current study employs up-to-date financial data from reliable sources, while looking at worldwide level. The following research questions will be addressed in the current study's analysis:

1. What is the impact of overall and individual ESG scores on the financial performance of companies within the utilities sector?
2. What is the impact of ESG controversies score on the financial performance of companies within the utilities sector?
3. Does the ESG controversies score moderate the relationship between the overall ESG score and utilities firms' financial performance?

To perform the research, a sample of 178 public utilities companies has been used. To provide a valuable answer to each research question, a total number of six hypothesis have been developed, and have been tested using for each dedicated regression models with ROA and ROE as dependent variables. All the regressions have been performed employing fixed effects panel data analysis.

The results of the study reveal mixed findings. The overall ESG score is significantly and negatively related to ROA, while the relationship with ROE is non-significant. The Environmental score has a negative and significant relationship with both ROA and ROE, while Social and Governance scores have non-significant relationships with both financial measures. The ESG controversies score has non-significant relationships with both ROA and ROE and does not moderate the relationship between the overall ESG score and the financial measures.

The findings of this study diverge from the dominant patterns observed in the broader ESG literature, where the majority of studies indicate a positive relationship between ESG performance and Corporate Financial Performance (Friede et al., 2015; Whelan et al., 2020), and a significant relationship between ESG controversies and firms' financial performance (Mendiratta et al., 2023; Nirino et al., 2021, Banjade, 2024; Brinette et al., 2023; Yi and Tae-Wook, 2023; Ali et al., 2024, Melinda and Wardhani, 2020). While the great part of existing studies concentrated on analyzing samples formed by companies belonging to several different industries, this study reinforces the notion that the impact of ESG and related controversies cannot be fully understood through generalized analysis, since the individual characteristics and institutional framework of each different sector can lead to different results. By offering a specific examination of the utilities sector, which has remained at the margins of the ESG-financial performance relationship research, this dissertation provides a new and unique perspective on how ESG scores and controversies interact with firms' financial performance in highly regulated industries.

The output of the research holds managerial value. It is possible to derive from it valuable insights for practitioners in the selected field, enabling conscious management of ESG initiatives and controversies within the utilities sector.

The dissertation is composed of eight chapters, including this introduction, and it is organized as follows. Chapter 2 provides an extensive literature review regarding the relationship between ESG and Corporate Financial Performance, ESG controversies and Corporate Financial Performance, and utilities sector and ESG. Chapter 3 is focused on hypotheses development, explaining the rationale behind each hypothesis presented. Chapter 4 contains a description of the sample of companies utilized in the study, the data collection method, and an overview of the dependent, independent and control variables employed in the regression models. Chapter 5 includes details of the regression models developed, the procedure followed to select the most appropriate panel data model, and the results of the regression analysis. Chapter 6 focuses on discussion regarding the findings of the research. Chapter 7 discusses the managerial implications of the study's outcomes, including actionable insights. Lastly, Chapter 8 offers a view of the limitations of the study, proposing directions for future research on the same topic.

II. LITERATURE REVIEW

In this chapter of the thesis, the focus will be on a literature review regarding the topics at stake. Several studies will be presented, together with their respective findings, to show what is the state of the art of the research about ESG and financial performance of firms, and ESG controversies and firm's performance.

The relationship between Environmental, Social and Governance indicators (ESG) and Corporate Financial Performance (CFP) has been a central topic of inquiry in both academic and practical realms in the last decades. While the first search for a link between ESG criteria and financial performance can be traced back to the 1970s (Friede et al., 2015), the topic gained significant traction recently. Between 2015 and 2020, the surge in interest in ESG topics led to the publication of over 1,000 research papers (Whelan et al., 2015), demonstrating its growing prominence as a critical area of study and practice. In 2020, a series of unprecedented "Black Swan" events, including the spread of COVID-19, a devastating locust plague in Africa and the delisting of Luckin Coffee following a fraud scandal, brought ESG to the forefront of global concerns, making the theme of sustainable development a hot topic in both academic and non-academic discussions (Li et al., 2021).
In contrast, the relationship between ESG controversies and CFP has garnered academic attention only recently, with the first studies on the topic being published just a few years ago (e.g. Aouadi and Marsat, 2018).

The chapter is organized as follows. The first sub-chapter is dedicated to the analysis of the ESG-Corporate Financial Performance relationship. In the first place, a paragraph to understand what ESG is and how it is measured, is presented. Subsequently, a brief overview of the ESG-CFP relationship is shown, before deep diving into the detail of several studies with different findings about the above-mentioned relationship. The second sub-chapter regards the relationship between ESG controversies and Corporate Financial Performance. It begins with a paragraph containing information about what ESG controversies are, also providing concrete examples. It then continues with a review of studies about the ESG controversies-CFP relationship. In the last sub-chapter, the topic of utilities firms and ESG is discussed, highlighting the central role of the utilities sector in the transition toward a sustainable future, and the current status of

research regarding how ESG practices shape the financial performance of utilities companies.

2.1. ESG and Corporate Financial Performance

2.1.1. Understanding ESG

The topic of firms' Environmental, Social and Governance factors (ESG) has become increasingly relevant throughout the years, and it is now of central importance in both academia and practice. The term ESG appeared for the first time in a report by the United Nations (UN) Global Compact (2004) named "Who Cares Wins – Connecting Financial Markets to a Changing World". With this document the UN Global Compact recommended that "it is in the interests of investors, asset managers and securities brokerage houses alike to improve the integration of ESG factors in financial analysis. This will contribute to better investment markets as well as to the sustainable development of the planet". In 2005, the Principles for Responsible Investments were launched by United Nations Environment Programme Finance Initiative (UNEP FI) in collaboration with the UN Global Compact. By adhering to the PRI, institutional investors can promote the disclosure of ESG related issues by portfolio companies, the integration of ESG issues in ownership policies and in investment analysis.

With time, standard-setters organizations developed ESG disclosure standards for several different industries. Examples of this are the Global Reporting Initiative (GRI) standards and the Sustainability Accounting Standard Board (SASB) standards. As reported by their website, the SASB standards "enable organizations 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." (SASB, 2024). The GRI standards, on the other hand, "enable any organization – large or small, private or public – to understand and report on their impacts on the economy, environment and people in a comparable and credible way, thereby increasing transparency on their contribution to sustainable development" (GRI, 2024).

More recently, leading asset management funds started to speak in the language of ESG. In 2017, Larry Fink, CEO and chairperson of Blackrock, wrote in its annual letter to companies' CEOs that Blackrock would have looked for ESG factors for "essential insights into management effectiveness and thus a company's long-term prospects" (Larry Fink, 2017). In the 2021 letter, Larry Fink underlined that "purposeful companies with better environmental, social and governance (ESG) profiles, have outperformed their peers" and that "broad-market ESG indexes are outperforming their counterparts" (Larry Fink, 2021).

ESG can be conceived in a range of ways. Pollman (2022) identified ESG as a series of factors for investment analysis, as standpoints to evaluate a firm's risk management, as Corporate Social Responsibility (CSR) or sustainability, and as ideological preference. For the sake of clarity, a definition of ESG, to which this entire study will reference to, is presented hereafter: "the collection of environmental, social, and governance factors that can materially affect a business" (Antolín-López and Ortiz-De-Mandojana, 2023). Going into detail for each one of the pillars of ESG, the E pillar consider issues such as the management of water and other resources, the dependence on fossil fuels, level of pollution, climate change, hazardous waste and their disposal and the carbon footprint (Sachini Supunsala et al., 2021). The S pillar was defined by the European Commission (EC) 95th directive of 2014 on non-financial reporting. The directive says that the social dimension of ESG should be considered both on the internal side (workers) and on the external one (relations with the social community and the customers) (EC, 2014). The G pillar, referring to governance, "forms the foundation of its ESG programs and the scaffolding on which policies addressing environmental and social issues are built" (File, 2023).

To measure their ESG performance, companies can use a variety of international sustainability frameworks and standards, including the above mentioned GRI and SASB standards. Antolín-López and Ortiz-De-Mandojana (2023) indicate a series of international sustainability frameworks available to companies: SASB standards, GRI standards, International Finance Corporation (IFC) performance standards, International Integrated Reporting Council (IIRC), IRIS+, ISO 26000 (2010), OECD Guidelines for Multinational Enterprises, Sustainable Development Goals (SDGs), UN Global Compact and PRI.

At the same time, the ESG performance of firms is assessed by various rating agencies worldwide. A non-exhaustive list of them includes KLD, Sustainanalytics by Morning Star, Moody's ESG, S&P Global, LSEG-Refinitiv and MSCI (Florian et al., 2022). Even though ESG ratings from different providers might disagree substantially (Chatterji et al., 2016), they are the main source of data for what concerns firms' ESG performance when it comes to academic research.

On the other hand, the financial performance of firms is typically assessed with a series of ratios. The following pages of this study show that the ratios which were used the most in the papers mentioned are: Return On Assets (ROA), Return On Equity (ROE), and Tobins'Q, that is defined as "the market value of a firm divided for the replacement cost of the firm's assets." (Fu et al., 2016). These financial ratios are readily available of online databases, usually managed by rating agencies (e.g. LSE-Refinitiv), thus they can be easily sourced and organized to be used in regression analysis.

2.1.2. Brief overview of the relationship between ESG performance and firm performance

During the 1970s, exploration on the connection between Corporate Financial Performance (CFP) and ESG began. Aldag and Bartol were the very first to review the empirical relationship between ESG and CFP in a paper published in 1978 (Aldag and Bartol, 1978). In mid-2010s, the number of research works on the relationship exceeded 2,200 (Friede et al., 2015).

Friede et al. (2015) went through a second order review of 60 review studies. They combined 3,700 individual results which were derived from more than 2,200 unique primary studies. The final result showed that there are over 2,100 empirical studies which suggest that there is a positive relationship between ESG and CFP. Recently, Whelan et al. (2020) worked on reviewing over 1,000 papers published on ESG over the five years between 2015 and 2020. They were able to shed light on how the various ESG factors can influence different financial metrics such as Return On Equity, Return On Assets and stock price performance. 58% of the more than 1,000 papers published on the topic reported that ESG and CFP have a positive relationship. 13% of the studies showed a neutral impact, 21% of the studies showed mixed results and 8% of the studies

showed a negative relationship. They concluded that while the majority of findings indicate a positive relationship, the results highlight ongoing disagreement on the topic.

The following paragraphs and pages detail both studies whose findings report a positive relationship between ESG scores and firm performance, studies providing evidence of the existence of a negative ESG-CFP relationship, and studies with mixed results.

2.1.3. Studies highlighting a positive relationship between ESG performance and firm performance

There are many studies affirming the existence of a positive relationship between ESG performance and Corporate Financial Performance, with country-focused studies offering robust evidence.

Pulino et al. (2022), for example, analyzed the impact of ESG disclosure on the financial performance of the largest Italian listed companies. Using ESG scores by LSEG-Refinitiv as proxies for ESG disclosure, and measuring corporate performance with ROA and Earnings Before Interests and Taxes (EBIT), they demonstrated a positive relationship between ESG disclosure and CFP. Wang and Sarkis (2017) assessed the ESG-CFP relationship in a sample of selected US companies using the ESG scores from the Bloomberg ESG database and evaluating the impact on ROA and Tobin's Q. Their study confirmed a positive relationship. Velte (2017) demonstrated a positive effect of ESG on the ROA and Tobins'Q of a sample of companies listed on the German Prime Standard, using ESG data sourced from Thomson Reuters' Asset4 database. Dalal and Thaker (2019) focused on 65 Indian firms listed on the NSE 100 ESG Index, confirming that positive ESG performance enhances financial performance (ROA) and firm's value (Tobin's Q).

Recent research highlights similar trends in China, where ESG considerations are becoming more and more prominent. A paper by Fei Wang (2024) from the Business School of the University of New South Wales, Sydney, Australia, investigated whether ESG performance, measured using the ESG rating framework provided by CSI, influences the ROA of a sample of A-share listed companies in China. The study also conducted a robustness check on the Tobin's Q and concluded that "…overall ESG score, financial profitability, and firm value are significantly and positively related". A

second paper, which uses Huazheng ESG rating index as a proxy for the ESG performance of enterprises and ROA to measure CFP, shows the positive impact of ESG ratings on the performance of Chinese listed manufacturing firms (Ding and Lee, 2024).

In addition to single-country studies, there are also multi-countries analysis supporting the positive link between ESG scores and financial performance. Koundouri et al. (2022) conducted an assessment on a sample formed by the best 50 European companies in terms of ESG performance (STOXX Europe ESG Leaders 50 Index), finding a positive connection between their ESG performance and ROE and ROA. Xie et al. (2019) concentrated on the relationship of specific ESG initiatives and CFP of a sample of worldwide large corporations, demonstrating a positive impact of most of these initiatives on firms' performance. Bhaskaran et al. (2020) based their study on a sample 4,886 companies selected on the base of the ESG ranking score in Thomson Reuters database, using as dependent variables the Tobins'Q, ROE and ROA. The results indicate that firms with higher ESG performance tend to create more value on the market. Naeem et al. (2022) investigated the ESG-CFP relationship on a sample of 1,042 companies from emerging countries, reporting that both single and combined ESG scores have a positive impact on firms' Tobins'Q and ROA. A study on a sample of 1,038 European listed companies of 22 countries was conducted by De Lucia et al. (2020), reporting the existence of a positive ESG-CFP relationship across diverse national contexts.

Table 1 provides a summary of the single and multi-country studies whose findings indicate a positive relationship between ESG and firm performance.

Table 1 - Studies indicating the existence of a positive ESG-CFP relationship

Author(s)	Countries/Region of reference	Time period	Key Findigs
Pulino et al. (2022)	Italy	2011-2020	Positive relationship between ESG performance and firms' ROA/EBIT.
Wang and Sarkis (2017)	United States of America	2009-2013	Positive relationship between ESG performance and firms' ROA/Tobins'Q.
Velte (2017)	Germany	2010-2014	Positive relationship between ESG performance and firms' ROA/Tobins'Q.
Dalal and Thaker (2019)	India	2015-2017	Positive relationship between ESG performance and firms' ROA/Tobins'Q.
Fei Wang (2024)	China	2018-2022	Positive relationship between ESG performance and firms' ROA/Tobins'Q.
Ding and Lee (2024)	China	2009-2022	Positive relationship between ESG performance and firms' ROA.
Kounduri et al. (2022)	Europe	2021	Positive relationship between ESG performance and firms' ROA/ROE.
Xie et al. (2019)	Worldwide	2015	Positive relationship between ESG performance and firms' ROA.
Bhaskaran et al. (2020)	Worldwide	2013-2021	Positive relationship between ESG performance and firms' ROA/Tobins'Q.
De Lucia et al. (2020)	22 European Countries	F.Y. 2018-2019	Positive relationship between ESG performance and firms' ROA/ROE.

2.1.4. Studies highlighting a negative relationship between ESG performance and firm performance

Some studies show opposite results, indicating a negative relationship between ESG measures and financial performance, challenging the dominant view of a positive correlation.

Beginning with studies based on a single-country analysis, Landi and Sciarelli (2019) focused of 54 Italian firms listed on Financial Times Stock Exchange Milano Indice di Borsa (FTSE MIB) index from 2007 to 2015, reporting a negative relationship between ESG performance and the abnormal returns of Italian firms. Brammer et al. (2006) found a negative relationship between ESG scores and the stock returns of UK firms, implying that UK firms with higher ESG ratings did not experience correspondingly higher financial returns. Ruan and Liu (2021) studied China's Shanghai and Shenzhen

A-share listed companies with ESG data available from 2015 to 2019, sourced from SynTao Green Finance. They concluded that there is a significant negative relationship between ESG activities and firm performance and value, with performance measured by ROA and firm value assessed using Tobins'Q.

Focusing on multi-countries studies, Cerciello et al. (2023) analyzed companies contained in the Euro Stoxx 300 and concluded that "Overall, our results indicate that—with a few exceptions—the effect of ESG practices on firm performance is negative". Chen et al. (2021), who focused on Chinese firms listed in Mainland China, Hong Kong SAR, the USA and Singapore, using ESG data from Bloomberg and Wind databases, reported that ESG fulfillment negatively impacts CFP in the short run. Lin et al. (2019) found a negative association between sustainable practices and the ROE, ROA and Return On Investment (ROI) of a panel of Fortune's 100 most admired firms. Duque-Grisales and Aguilera-Caracuel (2021) analyzed data on 104 multinational companies from Brazil, Chile, Colombia, Mexico and Peru from 2011 and 2015, highlighting that the relationship between their ESG scores (drawn from Thomson Reuters Eikon database) and financial performance (ROA) is significantly negative. Garcia and Orsato (2020), comparing emerging and developed countries through a sample of 2,165 firms from 2007 to 2014, found a negative ESG-CFP relationship in emerging markets. Table 2 provides a summary of the single and multi-country studies whose findings indicate a negative relationship between ESG and firm performance.

Table 2 - Studies indicating the existence of a negative ESG-CFP relationship

Author(s)	Country of reference	Time period	Key Findigs
Landi and Sciarelli (2019)	Italy	2007-2015	Negative relationship between ESG performance and firms' abnormal returns.
Brammer et al. (2006)	United Kingdom	2015	Negative relationship between ESG performance and firms' stock returns.
Ruan and Liu (2021)	China	2015-2019	Negative relationship between ESG performance and firms' ROA/Tobins'Q.
Cerciello et al. (2023)	11 Eurozone Countries	2010-2019	Negative relationship between ESG performance and firms' ROE.
Chen et al. (2021)	Mainland China, Hong Kong SAR, USA, Singapore	2008-2019	ESG fulfillment negatively impacts CFP in the short run.
Lin et al. (2019)	Worlwide	2008-2019	Negative relationship between ESG performance and firms' ROA/ROE/ROI.
Duque-Grisales and Aguilera-Caracuel (2021)	Brazile, Chile, Colombia, Mexico, Peru	2011-2015	Negative relationship between ESG performance and firms' ROA.
Garcia and Orsato (2020)	Emerging Countries	2007-2014	Negative relationship between ESG performance and firms' ROA.

2.1.5. Studies highlighting a mixed or neutral relationship between ESG performance and firm performance

While some studies find positive effects of ESG practices on CFP and other find negative effects, a third group of researchers identifies a mixed or neutral relationship between the variables.

Han et al. (2016) examined the relationship between ESG performance, using indicators sourced from the Bloomberg ESG database, and the financial performance (measured by ROE, Market-to-Book Ratio and stock return) of firms listed on the Korea Stock Market during the period 2008 to 2014. They found no relationship for the Social score, a positive relationship for the Governance score, and a neutral relationship for the Environmental score. Shakil et al. (2019) focused on 93 banks located in emerging countries during the period 2015 to 2018, demonstrating that Environmental and Social factors have a positive impact on ROE, whereas the Governance factor has no effect. Giannopoulos et al. (2022) investigated the effect of ESG initiatives on the financial performance of Norwegian listed companies from 2010 to 2019. Using the Thomson

Reuters Eikon database for ESG scores and measuring financial performance through ROA and Tobin's Q, they found a positive relationship between the overall ESG score and ROA, and a negative relationship between the overall ESG score and Tobin's Q. La Torre et al. (2021) analyzed the effect of ESG practices on the accounting-based performance of a panel of European Banks listed in the Stoxx Europe 600 index from 2008 to 2019, finding no significant relationship between the variables. In a multi-country study, Lopez-de-Silanes et al. (2020) concluded that ESG scores have little or no impact on risk-adjusted performance of firms. Gartia et al. (2024) examined the time-variant impact of ESG on the financial performance of Indian manufacturing firms from 2019 to 2022. They found out that the aggregated ESG score had a positive impact on the sample firms' financial performance. With regard to the single E, S, and G components, it was found that Environmental and Social scores had a positive impact on CFP, while the Governance aspect harms CFP. Also Narula and al. (2024) focused their attention on Indian firms, specifically 220 Indian companies listed in the Bangalore Stock Exchange during 2018 to 2020. The findings of their study declare a negative significant relationship between the Environmental score and firm performance, no significant relationship between the Social score and firm performance and a significant positive relationship between the Governance score and firm performance. Alareeni and Hamdan (2020) investigated the relationship between ESG disclosure and firms' ROA, ROE and Tobins'Q, using as sample the US S&P 500-listed companies during the period 2009 to 2018. They find that ESG disclosure positively affects a firm's performance measures. However, the separate analysis of the single E, S and G components showed that Environmental and Social disclosure is negatively associated with ROA and ROE, while being positively associated with Tobins'Q. Governance disclosure is positively related to ROA and Tobins'Q, and negatively related to ROE. Similarly, a series of other studies (e.g. Humphrey et al., 2012; Surroca et al., 2010; Chih et al., 2010) found non-significant relationship, adding further complexity to the puzzle. Table 3 contains a summary of the studies listed right above, and their respective findings.

Table 3 - Studies indicating the existence of a mixed or neutral ESG-CFP relationship

Author(s)	Countries/Region of reference	Time period	Key Findigs
Han et al. (2016)	Republic of Korea	2008-2014	Social and Environmental factors have no impact on firm's performance, Governance factor has a positive impact.
Shakil et al. (2019)	Emerging Countries	2015-2018	Social and Environmental factors have positive impact on firms' ROE, Governance factor has no impact.
Giannopoulos et al. (2022)	Norway	2010-2019	Positive relationship between ESG performance and firms' ROA. Negative relationship between ESG performance and firms' Tobins'Q.
La Torre et al. (2021)	Europe	2008-2019	No significant relationship between ESG performance and firms' ROA/ROE.
Lopez-de-Silanes et al. (2020)	United States of America, United Kingdom, France, Switzerland, Japan, Australia	2015-2018	ESG scores have little or no impact on risk-adjusted performance of firms.
Gartia et al. (2024)	India	2019-2022	The aggregate ESG score has a positive effect on firms' financial performance. The Environmental and Social scores have a positive relationship with CFP. Governance score has a negative relationship with CFP.
Narula et al. (2024)	India	2018-2020	Negative relationship between Environmental factor and firms' performance. No significant relationship between Social score and firm performance. Negative relationship between Governance factor and firm performance.
Alareeni and Hamdan (2020)	United States of America	2009-2018	ESG disclosure positively affects firm performance. E and S disclosure is negatively associated with ROA and ROE, while being positively associated with Tobins'Q. G disclosure is is positively related to ROA and Tobins'Q, and negatively related to ROE.
Humphrey et al., (2012)	United Kingdom	2002-2010	ESG does not have an effect on firms' market-based performance.
Surroca et al., (2010)	Worldwide	2002-2004	There is no direct relationship between ESG performance (in this case, Corporate Responsibility Performance) and firms' Tobins'Q.
Chih et al., (2010)	Woldwide	2003-2005	There is no direct relationship between ESG performance (in this case, Corporate Responsibility Performance) and firms' financial performance.

2.2. ESG controversies and Corporate Financial Performance

2.2.1. Understanding ESG controversies

Jucá et al. (2014) advanced a definition of ESG controversies, by saying that they "…arise following events or practices, associated with companies' products or operations, that may create risks for their reputation, due to their potential negative impacts related to environmental, social, or governance practices". ESG controversies do not represent only operational challenges for the company's management but also entail significant risks for the public image and financial health of the firm. These issues can lead the company to face sanctions and fines by regulatory bodies, as well as legal disputes, attracting attention from the media. Ultimately, they harm the company's reputation, and they impact its financial condition (Jucá et al., 2024).

In recent years, a series of massive ESG scandals has demonstrated the profound impact that controversies of this type can have on firms' financial performance, especially in terms of stock price (Gao et al. 2022). For instance, the Volkswagen emissions scandal is a case in point. At the beginning of 2014, the stock price of the car manufacturer Volkswagen plummeted because of the findings of an investigation conducted by the International Council on Clean Transportation Report (ICCT). The ICCT discovered a significant difference in the quantity of pollutants emitted from Volkswagen diesel vehicles between laboratory tests and on-road performance (Siano et al. 2017). In the days following this revelation, the stock price of the company fell by 20%, resulting in a net profit loss of 1.73 billion euros in third fiscal quarter of 2015 (Aurand et al. 2018). A second example of ESG controversy is the Deepwater Horizon oil spill disaster in 2010. Deepwater Horizon was an oil rig owned by British Petroleum (BP), that exploded on April 20, 2010 causing one of the of the biggest environmental disasters of the last years, severely damaging the nearby marine ecosystem. Furthermore, the incident had severe financial repercussions for BP. The company stock price dropped by 50% when the financial markets received the news, showcasing how ESG controversies can cause significant costs for the companies they affect (Fodor and Stowe, 2010). A third example dates to November 2014, when a television program accused a jacket manufacturer associated with the Italian luxury outerwear company

Moncler of using inhumane methods to pluck geese, resulting in a 6% drop in the company's share value (Gistri et al. 2018).

Moreover, ESG controversies may be highly costly for the investment returns of firms, thus impacting their investment efficiency (Aust et al. 2020). It has been shown that the process of building the firm's reputation is essentially a signaling process, with companies attempting to convey reliability and ethical commitment to stakeholders (Basdeo et al. 2006). However, ESG controversies can send negative signals to the public, harming the company's reputation. This deterioration in reputation can result in reduced stock liquidity and diminished possibilities for the company to obtain capital from external investors (Fernandez-Perez et al., 2022; Wang et al., 2012).

As for ESG scores, also ESG controversies scores are provided by rating agencies, that made them available on their databases, such as LSEG-Refinitiv, Sustainanalytics by Morning Star, MSCI.

2.2.2. The relationship between ESG controversies and firm performance

The topic of ESG controversies, and their relationship with a firm's performance and value has been the subject of a series of studies to date. Regarding single-country studies, Banjade (2024) analyzed the impact of ESG controversies scores on firm performance of a sample of US companies from 2002 to 2016. The study found a negative relationship between ESG controversies and firm value, as measured by Tobin's Q. Brinette et al. (2023) investigated the impact of ESG controversies on a sample of 119 French companies listed on the CAC All-Tradable index over the 2007 to 2021 period, showing a significant and negative relationship between ESG controversies and firm value. Mendiratta et al. (2023) focused on the impact of ESG controversies on the Corporate Financial Performance of Indian firms, with observations from 2007 to 2018. They reported that ESG controversies reduce firm performance. Yi and Tae-Wook (2023) studied the relationship between ESG controversies and firm value in the Republic of Korea, revealing a negative relationship between controversies and firm value. Ali et al. (2024) analyzed data from 419 non-financial firms listed on the Pakistan Stock Exchange from 2014 to 2023, discovering a significant negative relationship between ESG controversies and firms' Tobins'Q.

Multi-country studies offer additional insights into this phenomenon. Melinda and Wardhani (2020), used data from 1,356 companies across 22 countries in Asia, representing the Asian market from 2014 to 2018, to examine the relationship between ESG controversies and firm value (Tobins'Q). They found that the ESG controversies score positively influence the value of a company. Aziz et al. (2024) examined the effect of ESG controversies on firm performance using a sample of ASEAN (Association of Southeast Asia Nations) listed companies, utilizing profitability and market value indicators as dependent variables. In their study, they found a positive relationship between ESG controversies and Tobin's Q. Nirino et al. (2021) focused on the relationship between ESG controversies and firm performance in a sample of 600 European companies belonging to the Stoxx 600 Europe index, that includes the 600 largest companies listed in Europe. They used Tobins'Q, ROE and ROA as dependent variables, finding evidence of a negative relationship with ESG controversies. Table 4 summarizes the studies just mentioned, both the single-country and multi-country based ones.

Table 4 – Studies describing the ESG controversies-CFP relationship

Author(s)	Countries/Region of reference	Time period	Key Findigs
Banjade (2024)	United States of America	2002-2016	Negative relationship between ESG controversies and firms' Tobins'Q.
Brinette et al. (2023)	France	2007-2021	ESG controversies have a negative impact on firm value.
Mendiratta et al. (2023)	India	2007-2018	ESG controversies reduce firms' performance.
Yi and Tae-Wook (2023)	Republic of Korea	2013-2018	Negative relationship between ESG controversies and firms' Tobins'Q.
Ali et al. (2024)	Pakistan	2014-2023	Negative relationship between ESG controversies and firms' Tobins'Q.
Melinda and Wardhani (2020)	22 Asian Countries	2014-2018	Positive relationship between ESG controversies and firms' Tobins'Q.
Nirino et al. (2021)	Europe	2020	Negative relationship between ESG controversies and firms' ROA/ROE/Tobins'Q.

On the other hand, some studies have focused on the moderating effect played by ESG controversies on the relationship between ESG performance and firm performance or

firm risk. Shakil (2021) analyzed the relationship between ESG performance and firm's financial risk using a sample of 70 oil and gas firms from 2010 to 2018, finding evidence of an adverse effect of ESG performance on total risk. He then included ESG controversies as a moderating variable in the regression model, demonstrating that it has a significant moderating effect on the ESG and financial risk connection. Hampl and Vágnerova Linnertová (2024), investigated the moderating role of ESG controversies in the relationship between ESG performance and companies' cost of equity, finding evidence of a significant moderating effect. García-Amate et al. (2023) analyzed how ESG controversies can serve as a moderating variable on the relationship between Environmental, Social and Governance factors and Corporate Financial Performance using a sample of 264 oil and gas firms globally. The results of their study confirm the moderating influence of ESG controversies on the relationship between the E, S, and G dimensions and CFP. In Table 5, a summary of the studies mentioning the moderating effect of ESG controversies in different kinds of relationship, is displayed.

Table 5 – Studies describing the moderating role of ESG controversies on several relationships

Author(s)	Countries/Region of reference	Time period	Key Findigs
Shakil (2021)	Worldwide	2010-2018	ESG controversies moderate the negative effect of ESG performance on total company risk.
Hampl and Vágnerova Linnertová (2024)	Europe	2017-2022	ESG controversies moderate the negative effect of ESG performance on the company cost of equity.
García-Amate et al. (2023)	Worldwide	2007-2018	ESG controversies moderate the positive effect of the E, S, and G factors on firm performance.

2.3. Utilities sector and ESG

2.3.1. Utilities firms and their role in the sustainable transition

With attention to ESG topics and practices growing more and more globally, the companies in the utilities sector are called to play a pivotal role in driving the transition toward an economically and socially sustainable future. As the backbone of essential services, these companies represent the industry on which firms from all the other sectors rely on to meet their ambitious sustainability goals (Bauer et al., 2023). This

sector encompasses a diverse range of services, including energy, water services, waste management and public transport, which are collectively regarded as "…essential to the transformation towards a sustainable economy and society" (Bauer et al., 2023). The utilities sector is composed by companies that vary widely in terms of size, type of services offered, ownership structure and other contextual factors. It includes large multi-utility companies that provide a variety of services to millions of individuals, as well as small, localized companies delivering a single service to specific communities (D'Amore et al., 2024). Utilities companies may be either privately or publicly owned, but governments around consistently play a key role when it comes to their governance, financing, controlling, tariff setting and also market regulation (D'Amore et al., 2024). Throughout the years the ownership model characterized by the private-public dichotomy, has been substituted by a new network governance system, where hybrid organizations protect the public interest by operating under the government control (Warner et al., 2008).

While companies in the utilities sector provide essential public infrastructure and services to individuals, families and other firms, their value-creation processes may also result in negative impacts on the ecosystem, such as biodiversity loss, pollution, ozone depletion and a reduction in natural resources (Talbot and Boiral, 2018; Slacik and Greiling, 2020; Imperiale et al., 2023). Consequently, utilities companies are unique in that they generate both positive and negative externalities (Imperiale et al., 2023; Traxler and Greiling, 2019) and are classified as environmentally sensitive enterprises (Traxler and Greiling 2019).

On one hand, utilities companies are expected to create economic value for their shareholders and deliver public value for the society and communities. On the other hand, they must operate within social and environmental constraints while pursuing their goals. This dual mandate makes it imperative for utilities firms to disclose ESG information, which can serve as a crucial tool for demonstrating their commitment to sustainable practices (Nicolo et al., 2023). Effective ESG disclosure allows these companies to respond effectively to the increasing pressure exercised by institutions and stakeholders (Traxler and Greiling, 2019; Imperiale et al., 2023). Furthermore, ESG disclosure is and effective way to demonstrate the utilities firms' responsiveness to evolving social expectations and their ability to balance the different institutional logics

to which they are constantly exposed (Traxler and Greiling, 2019; Andrades et al., 2023; Yetano and Sorrentino, 2021).

To underline the critical importance of ESG practices and disclosure for the utilities sector, it is noteworthy that the world's leading standard-setting organizations, including the Sustainability Accounting Standard Board (SASB) and GRI, have developed sector-specific ESG disclosure standards tailored for utilities companies (Traxler and Greiling, 2019; Lu et al., 2019).

Previous studies emphasized that utilities companies mainly consider ESG disclosure a strategic decision (Mio, 2010), in a way to maintain the legitimacy of the firm (Imperiale et al., 2023; Valenza and Damiano, 2023), reduce the gap in expectation between stakeholders and managers (Ligorio et al., 2022), build operational capacity (Valenza and Damiano, 2023) and improve their reputation (Annessi et al., 2021). These findings are in line with a statement by Khalid et al. (2021), according to whom "Implementing an ESG framework is not an altruistic goal – it is an imperative that depicts financial success a sustainable future for all involved. Although ESG investing relies on the principles of social responsibility, it is not the only outcome to benefit when it is correlated with higher returns, lower attrition, and overall financial savings for the company".

The central role played by the utilities sector companies in addressing sustainability issues has also been emphasized by the United Nations' Agenda 2030, a document that summarizes a series of Sustainable Development Goals (SDGs) to be reached by the year 2030, aiming at making the world more inclusive, equitable, and sustainable by addressing pressing global challenges such as climate change, energy access, water scarcity, and sustainable urbanization (UN General Assembly, 2015). In particular, according to the SDG no. 6, namely Clear Water and Sanitation, no. 7, Affordable and Clean Energy, and no. 11, Sustainable Cities and Communities, utilities firms are called upon to ensure access to clear water and to provide reliable, safe and affordable clean energy, thus empowering the creation of sustainable cities and communities (D'Amore et al., 2024).

2.3.2. ESG and Utilities/Energy firms' financial performance

Even if utilities sector companies are central in the transition toward a more sustainable future, the number of studies examining the relationship between the ESG performance of utilities firms and their CFP is quite low. To provide a broader basis for this literature review, some relevant studies that reference energy companies in general are also included.

Şeker and Güngör (2022) analyzed this relationship using a sample of 325 companies in the utilities sector worldwide, with data spanning the period from 2010 to 2019. They sourced the data from Thomson Reuters ASSET4, Eikon-Refinitiv and Datastream databases. As dependent variables, they used Tobins'Q and ROA. The findings of the study suggest that ESG performance and its relative sub-dimensions of Environmental, Social and Governance do not have a significant impact on the dependent variables, thus indicating that the ESG performances of utilities firms have no impact on their financial performance. As mentioned above, companies in the utilities sector are classified as environmentally sensitive enterprises (Traxler and Greiling 2019). Li et al. (2024) have studied the impact of ESG systems implementation on the financial performance of Chinese companies belonging within industries with a significant environmental impact. They employed a dataset composed of 2,376 from 792 listed companies, spanning the period 2019 to 2021. ROA and ROE were used as dependent variables in the regression models. In this case, the findings demonstrated a significant positive relationship between overall ESG scores and financial performance. Moreover, the authors suggest that investing in environmental protection programs would be beneficial to improve resource allocation efficiency, social responsibility initiatives foster employee productivity and loyalty by the customers, and a strong corporate governance would improve management structures and decision-making processes. Fometescu et al. (2024) examined the relationship between ESG scores and financial performance indicators among the firms belonging to the energy and utilities sector. They analysis revealed that higher ESG scores are positively associated with ROA and ROE. In particular, it has been revealed that the correlation between ESG scores and financial performance was higher in the energy sector than in the utilities sector. Mio et al. (2023) conducted a study on the relationship between the ESG performance of utilities firms and their cost of equity, representing the investor's risk perceptions. They found a positive relationship between the overall ESG score, sourced from Refinitiv

database, and the cost of equity of utilities' firms. In particular, they found that only the Governance score of utilities firms reduced their cost of equity, thus highlighting the prominent importance of good governance practices in utilities firms' reputation-building process. Sidhoum and Serra (2017) used a sample of US investor-owned electric utility holding companies, with observations spanning the period 2005 to 2012, to study relationships among the economic, environmental, social, and governance dimensions. They found evidence of a strong link between economic and environmental performance, "suggesting that adoption of environmentally friendly technologies may improve firm efficiency and financial health". Their findings also highlighted a significant and positive relationship between economic and social performance, indicating that "providing better working environments leads to better economic outcomes", and a weaker, but still positive relationship between the economic and governance dimensions.

Some researchers focused their attention on the study of ESG practices adopted by utilities and/or energy firms as a consequence of new laws in their home country. For instance, Sueyoshi and Goto (2009) investigated the causality between environmental expenditures (short-term) and investments (long-term) to Corporate Financial Performance in the US electric utilities industry. They found out that environmental expenditures occurred under the US Clean Air Act from 1989 to 2001, had a negative impact on utilities firms' financial performance. On the other hand, environmental investments seem not to have influence on financial performance. Zhou and Wei (2016) made a comparison about the relevance of renewable energy corporate social responsibility and financial performance of renewable energy firms before and after the enactment of the Renewable Energy Law in China. In their analysis, they used a panel data of 26 renewable energy companies observed between 2001 and 2013, concluding that the Renewable Energy Law promoted a significant positive link between social performance and CFP. Table 6 present a summary of the studies just presented.

Table 6 – Studies describing the relationship between ESG and relevant financial measures in the context of utilities and energy firms

Author(s)	Countries/Region of reference	Time period	Key Findigs
Şeker and Güngör (2022)	Woldwide	2010-2019	ESG performance and the single E,S and G factors do not have impact on utilities firms' ROA and Tobins'Q.
Li et al. (2024)	China	2019-2021	Positive relationship between ESG performance and firms' ROA/ROE.
Fometescu et al. (2024)	Worldwide	2019-2023	Positive relationship between ESG performance and energy and utilities firms' ROA/ROE.
Mio et al. (2023)	Worldwide	2017-2021	The overall ESG score has a positive relationship with utilities' firms cost of equity. The G score is the only factor that directly reduces cost of equity.
Sidhoum and Serra (2017)	United States of America	2005-2012	There are positive relationships between economic and environmental performance, economic and social performance and economic and governance performance.
Sueyoshi and Goto (2009)	United States of America	1989-2001	Environmental expenditures under the US Clean Air Act reduced firms' performance. Environmental investments under under the same law did not have significant effect on firms' performance.
Zhou and Wei (2016)	China	2001-2013	The Renewable Energy Law promoted a significant positive link between corporate social performance and CFP.

Generally speaking, the majority of authors so far concentrated their effort on studying the relationship between ESG and financial performance for what concerns energy companies (e.g., Patari et al., 2014; Zhao et al., 2018; Constantinescu et al., 2021; Adamkaite et al., 2022), leaving apart pure utilities companies, that received less attention in terms of how their ESG performance impacts their financial outcome. The difference between energy and utilities company is clear when looking at the definitions reported on the Collins English Dictionary (2024), according to which an energy company configures as "a company that *produces* energy, such as electricity", while a utilities company is defined as "a company which *supplies* utilities, such as gas, electricity, phones, etc".

This gap in the literature presents an opportunity for further exploration into the field of utilities firms and how their environmental, social, and governance practices and controversies influence their financial performance.

III. HYPOTHESES DEVELOPMENT

As highlighted in the previous chapter, the growing importance that environmental, social and governance themes are gaining in recent years, have led numerous scholars all around the world to examine in detail the effect that ESG practices have of Corporate Financial Performance. Nevertheless, there is still an ongoing disagreement on the effects that ESG performance produces on CFP, and scholars were not able so far to reach a final, shared conclusion on the topic.

Opposite findings were observed among single-country studies, even with regards to the same country. For instance, among the studies previously mentioned, both Fei Wang (2024) and Ruan and Liu (2021) studied the relationship between ESG and firms' ROA and Tobins'Q using a sample of A-share listed companies in China, and they obtained contrasting findings. While Fei Wang (2024) found evidence of a positive impact of ESG performance on ROA and Tobins'Q, Ruan and Liu (2021) found out instead the existence of a negative relationship.

Similar contradictions can be found among multi-country studies as well. In the previous chapter, two studies by De Lucia et al. (2020) and Cerciello et al. (2023) were mentioned. Both group of researchers focused on the analysis of the ESG-CFP relationship in a European context. The sample employed by De Lucia et al. (2020) consisted in more than 1,000 European public companies, while Cerciello et al. (2023) used as a sample dataset a group of 200 European firms, constituents of the Euro Stoxx 300 index. While the results of the study by De Lucia et al. (2020) suggest that ESG performance exert a positive influence on a firm's Return On Assets and Return On Equity, Cerciello et al. (2023) found a significant negative relationship between ESG performance and the Return On Equity of the observed companies.

The existence of a number of studies whose findings reveal a neutral ESG-CFP relationship (e.g. La Torre et al., 2021; Lopez-de-Silanes et al., 2020; Humphrey et al., 2012; Surroca et al., 2010; Chih et al., 2010) as well as studies with mixed final results (e.g., Han et al., 2016; Shakil et al., 2019; Giannopoulos et al., 2022), adds complexity to the ongoing debate. Finally, also Whelan et al. (2020), that conducted a review of

over 1,000 studies on the ESG-CFP relationship between 2015 and 2020, highlighted the continued disagreement on the topic.

Furthermore, it is quite surprising that, despite their importance in the context of sustainable transition (Bauer et al., 2023), so far little research has been conducted on the relationship between ESG performance and financial performance in utilities companies. According to Şeker and Güngör (2022), prior to their study, there was not research in the literature on the ESG-CFP relationship in the utilities sector. Until now, researchers have either grouped utilities companies with energy companies in their studies (e.g., Fometescu et al., 2024) or they excluded them in favor of general energy companies (e.g. Makridou et al., 2024). This leaves room for further research to be conducted, and this study aims to fill this gap in the literature.

The first objective of this study is to analyze the relationship between ESG scores and Corporate Financial Performance in the context of utilities companies. The first four hypothesis to be tested align with this purpose:

Hypothesis 1: *The overall ESG score has a positive and significant impact on utilities companies' financial performance.*

Hypothesis 2: *The Environmental pillar score has a positive and significant impact on utilities companies' financial performance.*

Hypothesis 3: *The Social pillar score has a positive and significant impact on utilities companies' financial performance.*

Hypothesis 4: *The Governance pillar score has a positive and significant impact on utilities companies' financial performance.*

Return On Assets (ROA) and Return On Equity (ROE) will be used as proxies for the financial performance of utilities firms. Thus, they will be the dependent variables of the regression models used for the hypothesis testing. Reasons for choosing ROA and ROE as dependent variables will be accurately provided in the next chapter of this study.

The relationship between ESG performance and financial performance of utilities firms will be observed both by assessing the effect of the overall ESG score and the effect of the single Environmental, Social and Governance pillars on utilities firms' ROA and ROE. It is worth to disentangle ESG in its components since there have been studies whose findings revealed a diverse effect of the single E, S and G pillars on firms' performance (e.g., Han et al., 2016; Shakil et al., 2019; Gartia et al., 2024; Alareeni and Hamdan, 2020; Narula et al., 2024). Examining the impact produced by each component in ESG will be helpful in understanding toward which kind of ESG activities utilities firms should concentrate their efforts, as well as which ones they should disregard.

Moving forward, the next hypotheses aim to understand the effect of ESG controversies on the financial performance of utilities firms. As previously observed in this study, ESG scandals may have a profound impact on the financial health of a firm (Gao et al. 2022). However, the number of studies concerning the relationship between ESG controversies and Corporate Financial Performance is limited. While a significant portion of prior studies gave evidence that ESG controversies adversely impact CFP (e.g., Banjade, 2024; Brinette et al., 2023; Mendiratta et al., 2023; Yi and Tae-Wook, 2023; Ali et al., 2024; Nirino et al., 2021), there is still no full consensus on this matter, with some researchers finding opposite results (e.g., Melinda and Wardhani, 2020). Moreover, there is no clear evidence about the ESG controversies-CFP relationship within the context of utilities firms. The following hypothesis aim to contribute to research in this specific area:

Hypothesis 5: *The ESG controversies score has a negative and significant impact on utilities companies' financial performance.*

As with the previous hypotheses, also for this hypothesis ROA and ROE will be used as dependent variables, representing firms' performance. The independent variable will change, as the ESG score will be replaced by the ESG controversies score. The findings obtained from testing this hypothesis will provide useful insights about how the financial performance of utilities companies is shaped by how they are performing regarding ESG controversies.

Lastly, the last hypothesis to be tested aim to understand whether ESG controversies moderate or not the relationship between ESG performance and utilities firms' performance. Regarding this, the up-to-date literature is not particularly extensive. García-Amate et al. (2023) argued that ESG controversies moderate the positive effect of environmental, social and governance practices on firms' performance. Nevertheless, there is room for further research on the topic, and this study will assess the above-mentioned operating effect with regard to utilities companies. The last hypothesis is as follows:

Hypothesis 6: *The relationship between the overall ESG score and utilities companies' financial performance is moderated by the ESG controversies score.*

Stemming from the past literature and the identified gaps, the current research will deep dive into the domains of ESG practices and controversies within the utilities sector, contributing to fill the existing gaps in the related to this specific sector.

IV. DATA AND VARIABLES

This chapter describes the data and variables adopted for conducting the current research. The chapter is organized as follows: the first sub-chapter is dedicated to the sample and data collection, while the second one entails a description of the dependent, independent and control variables employed in the regression analysis.

4.1. Sample and Data collection

The study's research data have been sourced from the LSEG-Workspace (Refinitiv) database. LSEG stands for London Stock Exchange Group, and their Workspace is a financial database that provides access to company fundamentals, ESG data, global pricing data and more. LSEG-Workspace was previously known as Thomson Reuters, Thomson ONE, Thomson ONE Banker, Eikon, and Refinitiv. The process undertaken to extract the data for the current study is as follows:

1. Log-in to the LSEG-Workspace desktop platform, open the side menu, access to "My Apps" section and then to the "Screener" application.
2. Apply the TRBC Industry Classification (The Refinitiv Business Classification) and select "Utilities" to identify utilities companies. The "Utilities" classification includes sub-industries such as Multiline Utilities, Water & Related Utilities, Natural Gas Utilities, Electric Utilities & Independent Power Producers (IPPs).
3. Add "Columns" to be displayed in the Screener, in order to extract data regarding the relevant dependent, independent and control variables, referred to the last eight fiscal years.
4. Export the data to Excel to filter for companies with available data for the last eight fiscal years, where the end date of the last balance sheets ranges from 09/30/2023 to 06/30/2024, across all the selected columns.

The final sample is composed by 178 public companies with headquarters all around the world, with data spanning the last eight fiscal years. Below, two tables provide breakdowns of the companies according to their country and continent of headquarters.

Table 7 – Distribution of companies according to their country of headquarters

Country of Headquarters	Number of Companies
Argentina	1
Australia	3
Austria	1
Belgium	1
Bermuda	1
Brazil	11
Canada	12
Cayman Islands	1
Chile	5
China	6
Colombia	1
Czech Republic	1
Denmark	1
Finland	1
France	2
Germany	3
Greece	1
Hong Kong SAR	16
India	6
Indonesia	1
Italy	6
Japan	12
Republic of Korea	3
Malaysia	3
New Zealand	5
Philippines	4
Poland	2
Portugal	1
Russia	3
Saudi Arabia	1
Singapore	1
Spain	4
Thailand	2
United Kingdom	8
United States of America	48
Total	**178**

Table 8 – Distribution of companies according to their continent of headquarters

Continent of Headquarters	Countries of the Continent	Number of Companies	Percentage
South America	Argentina, Brazil, Chile, Colombia	18	10%
Oceania	Australia, New Zealand	8	4%
Europe	Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Italy, Poland, Portugal, Russia, Spain, United Kingdom	35	20%
North America	Bermuda, Canada, Cayman Islands, United States of America	62	35%
Asia	China, Hong Kong SAR, India, Indonesia, Japan, Republic of Korea, Malaysia, Philippines, Saudi Arabia, Singapore, Thailand	55	31%
Total		**178**	**100%**

As it can be observed from Table 7, more than one-fourth of the sample is composed by companies headquartered in the United States of America, followed by Hong Kong SAR and Japan and Canada. There are 14 countries with only a single company taken into consideration. From Table 8, it appears that North America is the most represented continent in the sample, and there is also a significant presence of Asian companies, as well as a good number of European companies.

The companies can be also divided according to the type of utilities service that they offer (sub-industry), as suggested by the TRBC Industry Classification.

Table 9 – Distribution of companies according to their sub-industry (TRBC Industry Classification)

TRBC Industry Classification (Sub-Industry)	Number of Companies	Percentage
Multiline Utilities	30	17%
Water & Related Utilities	13	7%
Natural Gas Utilities	27	15%
Electric Utilities & IPPs	108	61%
Total	**178**	**100%**

It appears that slightly more than 60% of the sample is composed by Electric Utilities and Independent Power Producers. The less represented sub-industry is Water & Related Utilities, that accounts for only 7% of the sample. Natural Gas Utilities and Multiline companies are almost equally present in the sample, with their respective percentages being 15% and 17%.

4.2. Variables

This sub-chapter is intended to explain the logic and the reasons behind the selection of the dependent, independent and control variables employed in the study. The choice of effective variables to measure the impact of ESG practices and controversies on the financial performance of utilities firms is crucial, highlighting the importance of dedicating a sub-chapter in explaining the relevance of each variable chosen in the context of this study.

4.2.1. Dependent Variables

In the current study, two different dependent variables will be adopted in the regression models designed for the hypotheses testing, representing proxies for firms'financial performance. These two variables are Return On Equity (ROE) and Return On Assets (ROA).

Both ROE and ROA are financial ratios. Financial ratios are obtained by comparing two or more variables present in the financial statement of the company for a given period of time (Tracy, 2012). They are important to analyze and evaluate the performance of a business, since they forecast the operational performance and the financial situation of the firm (Zaini and Mahmuddin, 2019).

Many authors in the past have used ROE and ROA to measure a company's financial performance in various studies. For instance, Islamiyati and Dala (2021), Lubis and Alfiyah (2021) and Alzararee et al. (2021) utilized Return On Equity as proxy for firm's performance. On the other hand, Dwilita and Mingka (2022) and Kayani et al. (2020) used Return On Assets for the same purpose.

In the context of studies regarding the relationship between ESG performance and firm performance, the use of both ratios can be observed as well. Among the authors cited in the literature review, the ones who employed ROA as dependent variable to indicate firm's performance, are Pulino et al. (2022), Wang and Sarkis (2017), Velte (2017), Dalal and Thaker (2019), Fei Wang (2024), Ding and Lee (2024), Xie et al. (2019), Bhaskaran et al. (2020), Ruan and Liu (2021), Duque-Grisales and Aguilera-Caracuel (2021), Garcia and Orsato (2020), and Giannopoulos et al. (2022). There are also

authors that used both ROA and ROE as proxies for financial performance, namely Kounduri et al. (2022), De Lucia et al. (2020), Lin et al. (2019), Alareeni and Hamdan (2020), Li et al. (2024), Fometescu et al. (2024). Lastly, there are authors who utilized solely ROE as proxy for financial performance in their research, as done by Cerciello et al. (2023) and Shakil et al. (2019).

Higgins (2012) defines ROA as "a basic measure of efficiency with which a company allocates and manages its resources". He provides the following formula to calculate ROA:

$$Return\ On\ Assets = \frac{Net\ Income}{Assets}$$

Return On Equity is defined by Ahsani (2012) as "the amount of net income returned as a percentage of shareholders' equity". According to Rappaport (1986) ROE is widely used as overall measure of Corporate Financial Performance. Ahsani provides the following formula to calculate ROE:

$$Return\ On\ Equity = \frac{Net\ Income}{Equity}$$

4.2.2. Independent Variables

The independent variables employed in this study include the utilities firms' ESG score, the individual scores for the Environmental, Social and Governance pillars, and the ESG controversies score. The ESG score will act as independent variable in the regression models for Hypothesis 1 and 6. The individual Environmental, Social and Governance pillars scores will serve as independent variables for testing the Hypothesis 2, 3, and 4. Lastly, the ESG controversies score will be used as independent variables in the regression models for Hypothesis 5 and 6, where their moderating effect on the relationship between the overall ESG score and utilities firms'financial performance will be evaluated.

All the data for the independent variables are sourced from the LSEG-Workspace (Refinitiv) database. The ESG scores provided by LSEG are based on publicly available

data, and they are based on a set of 186 measures per company, grouped into 10 categories that compose the individual pillar scores and the final ESG score. These 10 categories, summarized in Table 10, are Resource Use, Emissions and Innovation for the Environmental pillar; Workforce, Human Rights, Community and Product Responsibility for the Social pillar; Management, Shareholders, CSR Strategy for the Governance pillar. The score that a company obtains for each one of the ten categories is calculated based on a percentile ranking score methodology that considers three main factors:

1. How many companies are worse than the current one?
2. How many companies have the same value?
3. How many companies have a value at all?

The overall ESG score and the individual pillars score range between 0 and 100, where 0 representing the lowest score and 100 the highest.

Table 10 – ESG pillars and categories according to LSEG-Workspace (Refinitv)

Pillars	**Categories**
Environmental	Emissions Innovation Resource Use
Social	Community Human Rights Product Responsibility Workforce
Governance	Management Shareholders CSR Strategy

The ESG controversies score is calculated based on 23 controversy topics. The calculation process employes severity weights to address market-cap bias from which large-cap companies suffer, since they attract more attention from the media than smaller-cap companies when a controversy is in place. In this case as well, the score a company can obtain ranges between 0 and 100. Firms with no controversies will get a score of 100, and the score will decrease for every controversy accounted for.

4.2.3. Control Variables

The current study employs four control variables to ensure robustness in the regression models. The first control variable is Total Assets (in logarithmic form), that is one of the most popular proxies for Firm Size (Li and Dang, 2013).

$$Firm\ Size = \ln(Total\ Assets)$$

The second control variable utilized is Total Debt to Equity ratio, representing the firm's Leverage (Iqbal and Usman, 2018). Leverage refers to a company's capacity to utilize assets or funds with fixed burden to improve its financial performance. A high level of leverage indicates that the company must bear a high level of risk, but the expected returns are also higher (Lang et al., 1996).

$$Leverage = \frac{Total\ Debt}{Equity}$$

The third control variable employed is the Current Ratio, that is the ratio of Current Assets to Current Liabilities. It is a liquidity ratio that creditors use to determine whether a firm has sufficient working capital to meet its short-term needs (Berk and DeMarzo, 2016).

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

The fourth control variable presented is Asset Turnover. Asset Turnover is a ratio that measures how the assets owned by a company are operated in supporting the sales of the company itself.

$$Asset\ Turnover = \frac{Net\ Revenue}{Average\ Total\ Assets}$$

The control variables listed above have been already used in several previous studies concerning the relationship between a firm's ESG performance and financial performance. Referring to the authors mentioned in Chapter 2:

Total Assets was employed in the studies of Wang and Sarkis (2017), Velte (2017), Dalal and Thaker (2019), Fei Wang (2024), Ding and Lee (2024), Bhaskaran et al. (2020), Landi and Sciarelli (2019), Ruan and Liu (2021), Cerciello et al. (2023), Chen et al. (2021), Han et al. (2016), Shakil et al. (2019), La Torre et al. (2021), Brinette et al. (2023), Melinda and Wardhani (2020), Nirino et al. (2021), Şeker and Güngör (2022), Li et al. (2024), Mio et al. (2023), Sueyoshi and Goto (2009).

Total Debt to Total Equity ratio was employed in the studies of Pulino et al. (2022), Bhaskaran et al. (2020), Landi and Sciarelli (2019), Cerciello et al. (2023), Duque-Grisales and Aguilera-Caracuel (2021), Melinda and Wardhani (2020), Nirino et al. (2021), Mio et al. (2023), Sueyoshi and Goto (2009).

Current Ratio was employed in the studies of Wang and Sarkis (2017), Ding and Lee (2024), Duque-Grisales and Aguilera-Caracuel (2021), Brinette et al. (2023), Nirino et al. (2021), Şeker and Güngör (2022).

Asset Turnover is a popular variable used in studies concerning the prediction of firms' financial performance (e.g. Nasution et al., 2018; Rajagukguk and Siagian, 2021), and it has been also employed in research concerning the impact of ESG scores on Corporate Financial Performance (e.g. Aliyev and Alishov, 2023; Ozparlak, 2024).

Table 11 summarizes the series of dependent, independent and control variables that will be used in the study, while Table 12 reports the descriptive statistics of the variables employed.

Table 11 – Summary of the variables employed in the study

Variables	Definition
Dependent Variables	
Return On Assets	The firm's Net Income divided by its Total Assets.
Return on Equity	The firm's Net Income divided by its Equity.
Independent Variables	
ESG Score	The total ESG score of the firm.
Environmental Pillar Score	The Environmental pillar score of the firm.
Social Pillar Score	The Social pillar score of the firm.
Governance Pillar Score	The Governance pillar score of the firm.
ESG controversies Score	The score that reflects the ESG controversies by which the firm is affected.
Control Variables	
Firm Size	Natural logarithm of Total Assets.
Leverage	The ratio of Total Debt to Equity.
Current Ratio	The ratio of Current Assets to Current Liabilities
Asset Turnover	The ratio of Net Revenue to Average Total Assets

Table 12 - Descriptive statistics

	N	Mean	St. Dev	Min	Median	Max
Dependent Variables						
ROA	1424	0.03	0.03	-0.022	0.03	0.28
ROE	1424	0.09	0.12	-1.26	0.09	1.47
Independent Variables						
ESGScore	1424	53.65	17.58	2.28	53.90	93.50
EnvScore	1424	52.78	23.11	0.00	53.39	97.31
SocScore	1424	52.24	21.59	3.14	52.75	96.38
GovScore	1424	56.75	21.62	5.04	58.13	98.45
ESGCont	1424	91.35	21.40	2.27	100.00	100.00
Control Variables						
FirmSize	1424	23.47	1.15	18.91	23.47	26.27
Leverage	1424	1.37	1.09	0.00	1.37	11.05
CurrentRatio	1424	1.10	1.08	0.12	0.90	23.43
AssetTurnover	1424	0.38	0.29	0.01	0.29	3.93

V. MODELS AND ANALYSIS

Following the data collection and the description of the variables that are employed in the current study, this chapter will focus on the explanation of the research models developed to test the set of hypotheses presented in Chapter 3, the description of the procedure followed to determine which panel data model is the most suitable for each regression, and a comprehensive analysis of the results obtained.

5.1. Regression Models

To investigate the research objectives of this study, in accordance with the hypotheses previously described in Chapter 3, twelve different models have been developed. In all the equations presented below, "i" represents the firm and "t" the time period.

Each hypothesis will be tested by running two different regression models: one with ROA as the dependent variable and the other with ROE serving in this role. This means that ROA and ROE will be used as alternative measures of firms' financial performance, as already done by multiple authors cited in this study (Kounduri et al., 2022; De Lucia et al., 2020; Lin et al., 2019; Alareeni and Hamdan, 2020; Li et al., 2024; Fometescu et al., 2024). The use of both Return On Assets and Return On Equity as dependent variables allows for a broader understanding of the impact of the relevant ESG scores on utility firms' financial performance.

The first two models aim at studying the relationship between utilities firms' Corporate Financial Performance, as dependent variable, and the overall ESG score, as independent variable (Hypothesis 1).
In particular, in the first model the dependent variable is represented by Return On Assets, while in the second one Return On Equity has this role. For both models, Firm Size, Leverage, Current Ratio, Asset Turnover serve as control variables. The regression models are expressed as follows:

[1]. $$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

[2]. $$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

The third and the fourth models are focused on exploring the relationship between utilities firms' Corporate Financial Performance and the firms' Environmental score (Hypothesis 2). As in in the first two models, ROA and ROE are the dependent variables, while in this case, the independent variable is the Environmental score. The same set of control variables listed before is also employed in these models. Thus, the models are expressed in this way:

[3]. $$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 EnvScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

[4]. $$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 EnvScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

The fifth and the sixth models concern the relationship between utilities firm's financial performance and the Social score (Hypothesis 3). As done before, ROA and ROE serve as dependent variables, and the Social score serves as independent variable. The same set of control variables is employed. The fifth and the sixth models are presented as follows:

[5]. $$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 SocScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

[6]. $$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 SocScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

Continuing, the next two models are intended to study the effect of the Governance score of utilities firms' Corporate Financial Performance (Hypothesis 4). Again, ROA and ROE represent the dependent variables, while Governance score is the independent variable. Firm Size, Leverage, Current Ratio and Asset Turnover continue to serve as control variables. The regression models are presented below:

[7]. $$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 GovScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

[8]. $$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 GovScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

Models nine and ten aim at studying the relationship existing between utilities firms' financial performance and the ESG controversies score (Hypothesis 5). Thus, in this case the dependent variable is represented by ROA and ROE respectively, while the independent variable will be the ESG controversies score. The same set of control variables applies to these two models. The models are represented as follows:

[9]. $$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 ESGCont_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

[10]. $$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 ESGCont_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

The last two models are intended to explore whether the ESG controversies score moderate or not the relationship between the overall ESG score and utilities firms' performance (Hypothesis 6). In order to do so, the ESG controversies score and the ESG score will serve as independent variables, and an interaction term, defined as ESG controversies score*ESG score, will be also employed. ROA and ROE will be used as dependent variables. The control variables utilized in the previous models, will be present in these last two models as well. The models are presented below:

[11]. $$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGCont_{it} + \beta_3 (ESGCont_{it} * ESGScore_{it}) + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

[12]. $$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGCont_{it} + \beta_3 (ESGCont_{it} * ESGScore_{it}) + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

5.2. Correlation Results

Table 13 provides the Pearson correlation matrix for each variable employed in the study. It is clearly showed that, while the correlation between ROA, ROE and the ESG scores is weak, the ESG scores are highly correlated among themselves. Since LSEG-

Workspace (Refinitiv) utilizes the individual Environmental, Social and Governance scores to calculate the overall ESG scores, the high correlation coefficients are not a surprise. On the other hand, the ESG controversies score has little correlation with all the other ESG related scores. Return On Assets and Return On Equity have a high correlation level, since they both reflect the financial performance of the firm. A moderate level of correlation is also observed between the individual E, S, and G scores and Firm Size, that is, the natural logarithm of Total Assets.

Table 13 - Pearson correlation matrix

		V1	*V2*	*V3*	*V4*	*V5*	*V6*	*V7*	*V8*	*V9*	*V10*	*V11*
ROA	*V1*	1										
ROE	*V2*	0.74***	1									
ESGScore	*V3*	-0.06**	0.04	1								
EnvScore	*V4*	-0.06**	0.02	0.87***	1							
SocScore	*V5*	0.05*	0.1***	0.88***	0.67***	1						
GovScore	*V6*	-0.14***	-0.04	0.52***	0.16***	0.32***	1					
ESGCont	*V7*	0.13***	0.07***	-0.24***	-0.24***	-0.21***	-0.08***	1				
FirmSize	*V8*	-0.23***	-0.06**	0.46***	0.54***	0.35***	0.07***	-0.31***	1			
Leverage	*V9*	-0.36***	-0.18***	-0.01	0.04	-0.03	-0.05*	-0.1***	0.20***	1		
CurrentRatio	*V10*	0.21***	0.05*	-0.05**	-0.09***	-0.01	0.01	0.05**	-0.31***	-0.19***	1	
AssetTurnover	*V11*	0.18***	0.12***	-0.05*	-0.02	-0.04	-0.08***	-0.05*	-0.19***	-0.16***	0.05*	1

Note: The superscripts *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively

5.3. Methodology for the Regression Models

5.3.1. Panel data models

The dataset adopted in this study is a *panel dataset*. As defined by Xu et al. (2017), a *panel dataset* is "a cross-sectional time-series dataset, which, ideally, provides repeated measurements of a certain number of variables over a period of time on observed units, such as individuals, households, firms, cities, and states". Specifically, in this case the dataset is a *balanced panel dataset*, meaning that the observations in the sample are the same across all periods (Xu et al., 2017). Different panel data analysis models exist, and when performing academic research, selecting the appropriate model is crucial.

The most basic and simple model is the pooled OLS model. As suggested by Xu et al. (2017), this model can be only applied were neither temporal nor cross-sectional effects are present in the data. In such case, the data can be pooled, and OLS regression can be run. A second model, that is widely used in the literature, is the fixed effects model. It is utilized to control for omitted variables, which are constant over the period of time and vary across different units (Xu et al., 2017). Using the fixed effects model, the intent is to eliminate the unobserved heterogeneity, that is assumed to be correlated with any of the explanatory variables. (Xu et al., 2017). When the unobserved heterogeneity is independent of each explanatory variable, using the fixed effects model to eliminate the unobserved heterogeneity results in inefficient estimators (Greene, 2003). In this case, it is more appropriate to utilize the random effects model, which regards the unobserved heterogeneity not as fixed variables, but instead, as random ones (Greene 2003).

Ad-hoc tests, to be run on software for econometric analysis, have been developed to select the most appropriate panel data model based on the available dataset. The following paragraph is dedicated to explain the procedure followed in the case of the current study.

5.3.2. Selection of the appropriate Panel data model

A procedure composed of several different steps has been followed to select the right panel data model to perform each of the regression models presented in sub-chapter 5.1.

All the tests listed, as well as the regression models, have been run in the software R Studio. The detailed procedure is explained below.

First, The Augmented Dickey-Fuller test is employed to determine whether the data are stationary of non-stationary (Mushtaq, 2011). The results show that all the data are stationary.

Second, for each regression model, relevant tests are applied to choose which panel data model is the most suitable one. The F-Test for individual effects, the Breusch-Pagan Lagrange Multiplier Test and the Hausman test are employed F-Test for individual effects is intended to compare pooled and fixed effects model (Ergun et al., 2022). Pooled and random effect are then compared utilizing the Breusch-Pagan Lagrange Multiplier Test (Ergun et al., 2022). Lastly, the Hausman test is applied to compare fixed effects and random effects models (Baltagi, 2014). For each one of the 12 regression models, the fixed effects model results to be the most suitable. Thus, all the regression models are run employing fixed effects.

Third, the Pesaran CD test is applied to every regression model to check for the presence of cross-sectional dependence in the error terms (De Hoyos and Sarafidis, 2006). The results show that cross-sectional dependence is present in all the models. However, since the dataset employed has short time-series and larger cross-sectional units (that is, short T and larger N), cross-sectional dependence is not a factor complicating the research design (Ergun, 2022).

Fourth, the Breusch-Godfrey/Woolridge, test is applied to every regression model to check for serial correlation (Ergun, 2022). The findings show that serial correlation is present in the models. Nevertheless, serial correlation does not represent a complicating factor in micro-panels with short time series (Ergun, 2022), and this is the case of the current study.

Lastly, the Breusch-Pagan test is utilized to determine whether heteroskedasticity is present in the models (Breusch-Pagan, 1979; Ergun, 2022). The results show that heteroskedasticity is present in every model. To address heteroskedasticity, robust standard errors are employed when running the regression models.

In addition, multicollinearity has been assessed for each model using the Variance Inflation Factor (VIF). Multicollinearity has been found, due to the presence of interaction terms, in the last two regression models, where the VIFs for the variables ESG score, ESG controversies score and the interaction term are above 10. To solve this issue, mean-centering of the variables ESG score and ESG controversies score is employed. Mean-centering is defined as "the act of subtracting a variable's mean from all observations on that variable in the dataset such that the variable's new mean is zero" (Iacobucci et al., 2016). As Iacobucci et al. (2016) suggest, "In a multiple regression with predictors A, B, and A × B (where A × B serves as an interaction term), mean centering A and B prior to computing the product term can clarify the regression coefficients (which is good) and the overall model fit R^2 will remain undisturbed (which is also good)". It is confirmed that, when applying mean-centering to the variables mentioned before, the VIF values of ESG score, ESG controversies score and the interaction term result to be low (under 3), while the VIF values of the control variables and the R^2 of the models remain unchanged. Thus, the last two regression models will be run using mean-centered independent variables.

5.4. Regression Analysis results

Table 14 shows the results of the regression analysis for the first two models, Table 15 reports the results for models three to eight, Table 16 displays regression results for models nine and ten, and Table 17 includes regression results for the last two models.

When testing Hypothesis 1, the first regression model [1] reports a R^2 value of 0.11213, indicating a satisfactory level of the overall fit of the model. The overall ESG score, serving as independent variable, is found to be statistically significant at 5% confidence level (p-value = 0.027), and the relationship with the dependent variable, that is ROA, is negative. For every point increase in the overall ESG score, the ROA of a utilities firm reduces by 0.0003 points. Among the control variables, Leverage and Asset Turnover result in statistically significant p-values (p-value < 0.001 for both variables). While Leverage has a negative impact on ROA, Asset Turnover has a positive effect on it, with their respective coefficients being -0.013 and 0.045.

In the second regression model for testing Hypothesis 1 [2], ROE serves as dependent variable. The model presents a R^2 value of 0.14506, that indicates a good level of fit. In this case, the results shows that the relationship between the ESG score and ROE is not statistically significant. Two control variables show a statistically significant relationship with ROE. They are Leverage and Asset Turnover. Leverage has a negative relationship with ROE, with a coefficient of -0.074, while Asset Turnover has a positive relationship with the dependent variables, showing a coefficient of 0.123.

Hypothesis 2 is tested by two regression models with financial performance as dependent variable and the Environmental score as independent variable.
In the first of the two models [3], ROA serves as dependent variable. The R^2 value of the model is 0.11184, in line with the results obtained when testing Hypothesis 1. The results show that the Environmental score has a negative and significant relationship with ROA (p-value = 0.4339). For every point increase in the Environmental score, the ROA of a utilities firm reduces by 0.0002 points. Leverage and Asset Turnover are the control variables that have a statistically significant relationship with the dependent variable. Their coefficients and p-values are very similar to the one observed in the model used for testing Hypothesis 1.

The second model used to test Hypothesis 2 [4] shows a R^2 of 0.14563, witnessing a good level of fit. The regression output indicates the presence of a significant and negative relationship between the Environmental score and the ROE. The relationship results to be significant at 10% confidence level, while the coefficient of the independent variable is -0.001. As already observed when testing Hypothesis 1, Leverage and Asset Turnover are the control variables with a statistically significant relationship with ROE. Also, their coefficients and p-values are as in the previous model.

The first regression model related to Hypothesis 3 [5] reports a R^2 of 0.10876. The results of this regression reveal that the relationship between the Social score and ROA is statistically not significant. The control variables Leverage and Asset Turnover are significant, and their relationship with the dependent variable is the same observed in previous models involving ROA as dependent variable. In addition, in this regression model Firm Size turns out to be statistically significant at 10% confidence level. The

relationship between Firm Size and ROA is negative. In fact, the coefficient of Firm Size is -0.007.

When running the second regression model for Hypothesis 3 [6], the resulting R^2 is 0.14322. The model reports that the relationship between the Social score and ROE is not statistically significant. As happened in previous models, Leverage and Asset Turnover are the only control variables with significant p-values.

The first model for testing Hypothesis 4 [7] assesses the relationship between the Governance score and the ROA. The R^2 of this regression model is 0.10857. The relationship between the independent and the dependent variable is not significant. As for the control variables, Firm Size, with a coefficient of -0.008, is significant at 5% confidence level, while Leverage and Asset Turnover, with coefficients of -0.0132 and 0.045 respectively, are significant at 1% confidence level.

The second model used to test Hypothesis 4 [8] has a R^2 of 0.14295. The results show no significant relationship between the Governance score, that is the independent variable, and the dependent variable, represented by ROE.
Leverage and Asset Turnover have a significant relationship with ROE, as already observed in previous models.

In the models utilized to test Hypothesis 5, the ESG controversies score is the independent variable. The first one of these two models [9], has ROA as dependent variable. In this model, the ESG controversies score has no significant relationship with the dependent variable. The R^2 of this model is 0.10745. The second model [10] has ROE as dependent variable, and also in this case, the relationship with the ESG controversies score is not significant. In this case, the R^2 has a value of 0.143. In both models, the control variables Leverage and Asset Turnover are statistically significant at 1% confidence level. In the first model, also Firm Size is statistically significant at 5% confidence level, with a coefficient of -0.009.

In the last two models, the ones adopted to test Hypothesis 6, the ESG score and the ESG controversies score work as independent variable. An interaction term (ESG score*ESG controversies score) is also placed in the model. When testing Hypothesis

6, the regression model [11] output shows the presence of a significant negative relationship between the ESG score and ROA, in line with the results of the test for Hypothesis 1, while the ESG controversies score does not have a significant relationship with the dependent variable. As for the interaction term, the relationship with ROA is not statistically significant. For this model, the R^2 value is 0.10745. The significant control variables are Firm Size, Leverage and Asset Turnover.

The regression model with ROE as dependent variable [12] shows similar results. The ESG controversies score and the interaction term do not have a statistically significant relationship with ROE. The same applies to the relationship between the overall ESG score and ROE. The R^2 for this last model is 0.143. In this case, the significant control variables are Leverage and Asset Turnover.

Table 14 - Regression results (1)

	*ROA **[1]***	*ROE **[2]***
ESGScore	-0.0003**	−0.001
	(0.0001)	(0.0005)
EnvScore		
SocScore		
GovScore		
ln(TotalAssets)	-0.004	0.012
	(0.004)	(0.023)
Leverage	-0.013***	−0.074***
	(0.003)	(0.021)
CurrentRatio	0.0002	-0.002
	(0.001)	(0.002)
AssetTurnover	0.045***	0.123***
	(0.011)	(0.038)
N	1424	1424
R^2	0.11213	0.14506

Note: Robust standard errors are in parenthesis. The superscripts *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 15 - Regression results (2)

	ROA ***[3]***	*ROA* ***[5]***	*ROA* ***[7]***	*ROE* ***[4]***	*ROE* ***[6]***	*ROE* ***[8]***
ESGScore						
EnvScore	-0.0002**			−0.001*		
	(0.0001)			(0.0004)		
SocScore		-0.0001			-0.0002	
		(0.0001)			(0.0003)	
GovScore			-0.0001			-0.0001
			(0.0001)			(0.0003)
ln(TotalAssets)	-0.005	-0.007*	-0.008**	0.013	0.004	0.001
	(0.004)	(0.004)	(0.004)	(0.023)	(0.021)	(0.019)
Leverage	-0.013***	−0.013***	−0.012***	−0.074***	−0.074***	−0.074***
	(0.003)	(0.003)	(0.002)	(0.021)	(0.020)	(0.020)
CurrentRatio	0.0002	0.0001	0.0002	-0.002	-0.002	−0.002
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
AssetTurnover	0.045***	0.045***	0.045***	0.123***	0.123***	0.123***
	(0.011)	(0.011)	(0.011)	(0.038)	(0.038)	(0.038)
N	1424	1424	1424	1424	1424	1424
R^2	0.11184	0.10876	0.10857	0.14653	0.14322	0.14295

Note: Robust standard errors are in parenthesis. The superscripts *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 16 - Regression results (3)

	*ROA **[9]***	*ROE **[10]***
ESGScore		
ESGCont	-0.0000	0.0001
	(0.00004)	(0.0002)
*(ESG Score*ESGCont)*		
ln(TotalAssets)	-0.009**	0.0004
	(0.004)	(0.019)
Leverage	-0.013***	-0.074***
	(0.003)	(0.020)
CurrentRatio	0.0002	-0.002
	(0.001)	(0.002)
AssetTurnover	0.045***	0.123***
	(0.011)	(0.038)
N	1424	1424
R^2	0.10745	0.143

Note: Robust standard errors are in parenthesis. The superscripts *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

Table 17 - Regression results (4)

	*ROA **[11]***	*ROE **[12]***
ESGScore	-0.0003**	-0.002
	(0.0001)	(0.001)
ESGCont	-0.00002	-0.0004
	(0.00004)	(0.001)
*(ESG Score*ESGCont)*	0.0000	0.00001
	(0.0000)	(0.00001)
ln(TotalAssets)	-0.004**	0.013
	(0.004)	(0.024)
Leverage	-0.012***	-0.073***
	(0.003)	(0.021)
CurrentRatio	0.0002	-0.002
	(0.001)	(0.002)
AssetTurnover	0.045***	0.123***
	(0.011)	(0.038)
N	1424	1424
R^2	0.10745	0.143

Note: Robust standard errors are in parenthesis. The superscripts *, **, and *** represent statistical significance at the 10%, 5%, and 1% confidence levels, respectively.

VI. DISCUSSION

After having performed all the regression analysis, this chapter is dedicated to the discussion of the main findings of the research in both economic and managerial contexts.

6.1. Conclusion 1: Impact of the overall ESG score and Individual Pillars scores on the financial performance of utilities firms

The first two models ([1] and [2]) investigate the relationship between the overall ESG score and the financial performance of firms belonging to the utilities industry. The analysis performed show a negative and significant relationship between the overall ESG score and ROA, and a not significant negative relationship between the ESG score and ROE.
These findings are in contrast with the prediction stated in Hypothesis 1.

Subsequently, the following six models ([3], [4], [5], [6], [7] and [8]) have tested the relationship between the individual Environmental, Social and Governance scores with the Return On Assets and Return On Equity of utilities firms. According to the findings of the analysis, the Environmental score has a statistically significant and negative relationship both with ROA and ROE, in contrast with the projection contained in Hypothesis 2.
On the other hand, both for the Social and Governance scores, it was detected a non-significant relationship with the dependent variables. Thus, Hypotheses 3 and 4 are not supported by the results of the regression analysis.

Given the heterogeneity of results of the studies concerning the relationship between ESG performance and Corporate Financial Performance, the outcome of the current study is not surprising. As already presented in Chapter 1, there is no accordance in the academic field regarding the relationship between ESG scores and firms' financial performance, with numerous studies presenting different and contrasting findings.
The results obtained in this study align with the findings of Ruan and Liu (2021) and Chen et al. (2021), who concluded that a negative and significant ESG-ROA relationship exists. In particular, Chen et al. (2021) observed that companies fulfilling

ESG requirements may incur short-term costs that negatively impact their financial performance.

This might be the case of utilities companies, which are important actors in the transition toward a sustainable way of living, where renewable energy will substitute traditional energy sources (Bauer et al., 2023). These companies are called by society for greater effort in ESG practices and disclosure (Nicolo et al., 2023), but the fulfillment of ESG objectives could generate negative effects on their financial performance in the short-run (in this case, specifically ROA), since it causes company to incur in additional costs, a perspective supported by a part of the literature (Şeker Y. Güngör, 2022).

Moreover, the industry in question involves regulated operations and substantial infrastructure expenditure (D'Amore, 2024). Resource commitments related to ESG might need for a longer time horizon to yield benefits in capital-intensive sectors, where immediate returns tend to be overshadowed by ongoing expenditures for infrastructure, technology, and regulatory compliance. Consequently, in many utilities firms, long-term considerations such as improving their reputations or gaining the favor of the regulators may take precedence over near-term financial ratios. This could be especially true when large-scale environmental initiatives are mandated by policymakers or requested by important stakeholders.

The stringent regulatory frameworks under which utilities companies operate can also explain the non-significant relationship between the overall ESG score and Return On Equity. In regulated utilities markets, companies often function as natural monopolies. Given the high infrastructural costs and barriers to entry, it is common for a single firm to supply different essential services more efficiently compared to multiple competing firms, ultimately leading to a situation of natural monopoly (Crew and Kleindorfer, 1986). In such situations, governmental agencies oversee the activity of utilities firms by approving the rates they can charge, preventing them from exploiting customers (Viscusi et al., 2018). If utilities firms incur in additional costs, such as expenses for implementing ESG initiatives, they can request permission to regulators to modify their rates accordingly. This is a process typical of the "rate-of-return" regulation framework (Jamison, 2005) and ensures that companies can maintain a stable Return On Equity despite the additional costs.

Since the dataset of the current study is composed by a multitude of utilities firms headquartered all around the world, the diverse regulatory environments across different countries may further explain the non-significant relationship between ESG performance and ROE. In some jurisdictions, regulators may allow utilities to pass on ESG-related costs to consumers through rate adjustments, reducing the impact on ROE. Conversely, in other regions, such adjustments may be more tightly controlled or less likely to fully offset the costs. Therefore, the varying regulatory responses to ESG-related expenditures may dilute the relationship between ESG scores and ROE, making it statistically non-significant in the context of this study.

The Environmental score has a statistically significant and negative relationship with both Return On Assets and Return On Equity. Nonetheless, while the Environmental score-ROA relationship is significant at 5% confidence level, the Environmental score-ROE relationship is only significant at 10% confidence level.
As already stated before, utilities companies have a central role in the transition towards a sustainable future (Bauer et al., 2023). For this reason, they are called to invest large amounts of money to improve their environmental performance, aligning their operations with sustainability principles and contributing to economic development (Fometescu et al., 2024).

These intensified environmental investments, while reflecting the growing expectations of stakeholders, also highlight how capital allocation in the utilities sector might cause a reduction of short-term profit. On the other hand, when considering a long-term perspective, substantial investments in green infrastructure may help utilities firms in maintain their competitivity, especially considering the tightening of environmental regulations. Thus, adopting rigorous environmental practices might help companies in this sector to preserve their long-term profitability, despite their negative impact on short-term financial performance.

As for the Social and Governance Scores, no significant relationship was found with the dependent variables ROA and ROE.
With regard to ROA, the results for the Social and Governance Score reflect the findings of Şeker and Güngör (2022), who already found a non-significant relationship between

Social, Governance scores and Return On Assets. The same conclusion extends to ROE, suggesting that utilities firms with higher Social or Governance scores perform similarly in terms of profitability and shareholder returns compared to firms with lower scores. The cause behind this outcome may be the relatively narrow variation in social and governance practices within the regulated utilities sector, where established regulatory frameworks and industry norms ensure a baseline level of performance. For instance, the core operations of utilities may embed strict corporate governance principles and baseline social responsibilities, such as fair labor practices or continuous service provision, thus leaving less space for variations to translate into relevant short-term financial impacts.

As a consequence, while these two dimension of the ESG paradigm remain important for long-term risk management and stakeholders' relations, they might not directly impact short-term performance metrics such as ROA and ROE (Oikonomou et al., 2012).

In conclusion, the interplay between regulatory mandates, significant infrastructure costs, and strategic priorities can serve as an explanation to how the utilities sector can experience the presence of a negative relationship between environmental initiatives and short-run financial performance, while remaining relatively stable with respect to social and governance practices. Such a conclusion diverges from the dominant patterns observed in the broader ESG literature, as the majority of studies, in absolute terms, have found evidence of a positive ESG-CFP relationship (Friede et al., 2015; Whelan et al., 2020). However, a large part of the research on the relationship between ESG scores and financial performance lacks sector specificity and focuses on evaluating the relationship by pooling companies from various industries. As a matter of fact, when narrowing down to specific business contexts, the sector-specific characteristics may influence the ESG-CFP relationship in distinct ways, leading to variations in findings that differentiate from broader market trends. This study reinforces the notion that the impact of ESG cannot be fully captured through generalized analysis. Instead, the individual characteristics and institutional framework of each different sector can lead to different results in the ESG-CFP relationship, thus extending the existing knowledge on the topic and contributing to the ongoing discussion of how ESG scores and performance shape financial performance in highly regulated contexts.

6.2. Conclusion 2: Impact of the ESG controversies score of the financial performance of utilities firms and the moderating effect on the ESG-firms' performance relationship

The models for testing Hypothesis 5 ([9] and [10]) investigated the relationship between the ESG controversies score and the financial performance of utilities firms. As provided by the output of both models, the relationship between the ESG controversies score and the two dependent variable variables is non-significant. Hence, the prediction embodied in Hypothesis 5 cannot be supported.

The last two models, utilized to test Hypothesis 6 ([11] and [12]), contain the ESG score and ESG controversies score as independent variables, as well as the interaction term (ESGScore*ESGCont). The results of these last two regressions reflect the findings of the previous ones. When ROA is the dependent variable, the ESG score is a significant independent variable, while the ESG controversies score and the interaction term have non-significant relationship with Return On Assets. On the other hand, when ROE is the dependent variable, the ESG score, ESG controversies score and the interaction term have all non-significant relationships with ROE. Consequently, Hypothesis 6 cannot be supported.

Two main reasons can explain the non-significance of the ESG controversies score as independent variable. The first one is referred to real world considerations, the second to the statistical characteristics of the dataset analyzed in this study.

First, the insignificance may be attributed to regulatory mechanisms, such as the rate of return regulation mentioned above (Jamison, 2005), that might allow firms to pass additional costs associated with ESG controversies directly on the customers, by adjusting charge rates accordingly, thereby neutralizing the impact on accounting performance. Second, the mean ESG controversies score for the sample of companies considered in this study is 91.35 out of 100, with a median score is 100, indicating a generally low level of controversies across the sample during the period of time considered. Having a large number of observations with similar values might lead to non-significance of the ESG controversies score when investing its relationship with

ROA and ROE. Consequently, the non-significance of the ESG controversies score as an independent variable also affects the insignificance of the interaction term.

In general, it is not surprising that for companies operating in regulated or quasi-monopolistic frameworks, controversies may not escalate to a level able to influence and potentially compromise financial outcomes. Controversies in utilities can be swiftly managed to avoid reputational harm, thanks to long-term oversight, risk-adverse strategic approaches and relatively stable revenue streams. The overall stability of this sector can be effective in reducing the financial consequences that ESG controversies may entail in other industries, such as the oil and gas sector (Shakil, 2021; García-Amate et al., 2023).

Overall, the findings regarding the ESG controversies score add further complexity to the ESG controversies-CFP relationship puzzle, as there is no consensus on the connection between ESG controversies and firm performance. According to the dominant view, ESG controversies have a negative relationship with firm performance and value (Mendiratta et al., 2023; Nirino et al., 2021, Banjade, 2024; Brinette et al., 2023; Yi and Tae-Wook, 2023; Ali et al., 2024). On the other hand, there are scholars who found evidence of a positive relationship (Melinda and Wardhani, 2020). The current study contributes to the ongoing debate by offering a new perspective regarding the role of ESG controversies in a highly regulated sector. Whereas previous research noted that ESG controversies could impact a company's financial measures, such as ROA and Tobin's Q, the results of this study suggest that the same pattern does not materialize in the case of utilities, highlighting sector-specific characteristics that can help buffering the negative effects normally associated with ESG controversies.

In conclusion, this study has gathered interesting findings, considering the current lack of research concerning the relationship between ESG factors and firms' financial performance in the specific context of the utilities industry. Ultimately, mixed results have been found. The regression models tested highlighted the presence of a significant relationship between the overall ESG score and ROA, as well as between the Environmental score and both ROA and ROE. The overall ESG score does not have a statistically significant impact on ROE, while Social and Governance scores do not have a significant relationship with both ROA and ROE. Lastly, the study revealed that

the ESG controversies score does not have a significant relationship with utilities companies' financial performance measures and does not moderate the relationship between the overall ESG score and firms' financial performance.

VII. MANAGERIAL IMPLICATIONS

The investigation conducted in this thesis revealed mixed empirical results when studying the relationship between ESG factors and financial performance measures in the context of companies belonging to the utilities industry.

This dissertation contributes to the existing literature on the ESG-CFP relationship, addressing a gap regarding a lack of research specifically focused on the utilities industry, whose companies are crucially important for modern society, its future development, and the relationships they maintain with firms belonging to other sectors (Bauer et al., 2023; D'Amore et al., 2024).

The objective of this study, as the title states, was to study the interplay between financial, sustainability performance and ESG controversies in the utilities sector. The results of the study offer valuable insights for researchers and practitioners.

First, the negative and significant relationships between the Environmental score and utilities firms' financial performance, suggests that while investing in environmental sustainability is essential for utilities firms, these investments can potentially impact the short-term profitability of the companies. Thus, utilities companies should carefully balance their environmental initiatives with their financial goals, in a way to ensure that future investments strain profitability as little as possible in the short run. Managers might consider exploring green bonds emissions, subsidies or public-private partnerships to offset the upfront costs and reduce the pressure on profitability metrics. Additionally, where not already provided, managers might engage with regulators and governments to obtain rewards for environmental compliance, such as tax breaks or accelerated depreciation for environmentally friendly infrastructure.

Second, since Social and Governance scores do not have a significant relationship with the performance metrics, it is suggested to managers in the utilities sector to prioritize compliance with industry norms and regulatory requirements, rather than exceeding these standards, and allocate the resources to areas of greater need. By focusing on core operational activities, firms can ensure that they meet the required regulatory

benchmarks without diverting resources toward aspects that do not have impact on short-term financial performance.

Third, while ESG controversies do not significantly affect ROA and ROE, utilities firms should implement ESG risk management systems to detect and address potential issues early. The high average ESG controversies score of the sample (91.35) suggests that most of the companies already perform well in this sense. Maintaining this advantage to avoid an outlier status is key, since an unfavorable event could attract negative attention in evolving regulatory landscapes and adversely affect the company's reputation and prospects.

These practical suggestions are actionable in the industry of reference and align with the key role that utilities company have in the contemporary world. By strategically managing environmental investments, adhering to industry norms in social and governance fields, and preventing potential ESG controversies, utilities firms can enhance their competitivity while, at the same time, contributing to long-term sustainable development.

VIII. STUDY LIMITATIONS AND FURTHER RESEARCH

The study contained in this dissertation was conducted using rigorous methods and procedures. Nevertheless, it presents some limitations and leaves room for potential further research.

First, in this study financial performance has been measured through Return On Assets and Return On Equity. In the future, researchers might utilize other variables and proxies for firm performance, such as stock returns, and study their relationship with ESG scores in the context of utilities companies.

Second, the sample of companies utilized in the current study is geographically heterogeneous. Future research could narrow the scope to one or few specific countries or regions, also accounting for the specific characteristics of the local regulatory framework in which utilities companies operate.

Third, the sample adopted in this dissertation is entirely formed by public companies. In the future, it would be advantageous to include also non-public utilities companies in studies concerning the relationships they have with the ESG scores. The inclusion of non-public companies in the sample would allow to have a greater number of observations available for regression analysis, potentially improving the reliability of the statistical results.

Fourth, the ESG scores employed in the studies are all provided by LSEG-Workspace (Refinitiv), but a multitude of other ESG score providers exists. In future studies, researchers could adopt scores from sources other than LSEG-Workspace to study the relationship between ESG scores and utilities firms' financial performance and observe whether the results confirm or contrast the findings of the current study.

Last, the dataset used for the purposes of this dissertation covered eight fiscal-years, which is a relatively limited time period. Future research might consider a longer data collection period, allowing for the study of the ESG-CFP relationship over a more extended time horizon.

To conclude, although the above-mentioned limitations might partially affect the analysis presented in this dissertation, the findings remain robust and offer valuable insights into the various relationships between ESG factors and financial performance for companies in the utilities sector.

SUMMARY

I. INTRODUCTION

The purpose of this dissertation is to investigate the relationship between ESG scores and controversies and financial performance (Return On Assets and Return On Equity) in companies within the utilities sector.

In the last years, many scholars focused their efforts on studying the connection between Environmental, Social, Governance factors and firm performance. Nevertheless, no consensus has been reached so far on the topic, with part of the literature evidencing the existence of a positive relationship (e.g. Wang and Sarkis, 2017; Velte, 2017; Fei Wang, 2024; Xie et al., 2019), while findings provided by other researchers revealed a negative ESG-financial performance relationship (e.g. Ruan and Liu, 2021; Cerciello et al., 2023; Chen et al, 2021; Lin et al., 2019). In addition, a third group of studies has reported mixed or neutral results (e.g. Han et al., 2016; Shakil et al., 2019; La Torre et al., 2021; Narula and al., 2024).

Interestingly, despite the large number of sector-specific ESG studies, very little research has been conducted so far on the link between ESG performance and financial performance in the context of utilities firms. Utilities firms are important actors in today's society and have an important role in shaping its future (Bauer et al., 2023). This lack of research specifically concerning the utilities sector represents a significant gap in literature. The current study aims at filling this gap.

To provide an in-depth overview of how ESG scores and controversies influence the performance of firms belonging to the selected industry, the current study employs up-to-date financial data from reliable sources, while looking at worldwide level. The following research questions will be addressed in the current study's analysis:

1. What is the impact of overall and individual ESG scores on the financial performance of companies within the utilities sector?

2. What is the impact of ESG controversies score on the financial performance of companies within the utilities sector?
3. Does the ESG controversies score moderate the relationship between the overall ESG score and utilities firms' financial performance?

To perform the research, a sample of 178 public utilities companies has been used. To provide a valuable answer to each research question, a total number of six hypothesis have been developed, and have been tested using for each dedicated regression models with ROA and ROE as dependent variables. All the regressions have been performed employing fixed effects panel data analysis.

The results of the study reveal mixed findings. The overall ESG score is significantly and negatively related to ROA, while the relationship with ROE is non-significant. The Environmental score has a negative and significant relationship with both ROA and ROE, while Social and Governance scores have non-significant relationships with both financial measures. The ESG controversies score has non-significant relationships with both ROA and ROE and does not moderate the relationship between the overall ESG Score and the financial measures.

The findings of this study diverge from the dominant patterns observed in the broader ESG literature, which largely indicates a positive ESG-financial performance relationship and a significant impact of ESG controversies on firms' performance. While most of the existing studies analyzed samples formed by companies belonging to different industries, this study highlights the need for sector-specific analysis, as diverse industry characteristics and different institutional frameworks can lead to different results. By examining the utilities sector, which has remained so far at the margins of the ESG-financial performance research, this study provides a new and unique perspective on how ESG scores and controversies interact with firms' financial performance in highly regulated industries.

II. LITERATURE REVIEW

The relationship between environmental, social and governance indicators (ESG) and corporate financial performance (CFP) has been a central topic of inquiry in both

academic and practical realms in the last decades. In contrast, the relationship between ESG controversies and CFP has garnered academic attention only recently.

2.1 ESG and Corporate Financial Performance

ESG can be conceived in a range of ways. For the sake of clarity, a definition of ESG, to which this entire study will reference to, is presented hereafter: "the collection of environmental, social, and governance factors that can materially affect a business" (Antolín-López and Ortiz-De-Mandojana, 2023). Going into detail for each one of the pillars of ESG, the E pillar consider issues such as the management of water and other resources, the dependence on fossil fuels, level of pollution, climate change, hazardous waste and their disposal and the carbon footprint (Sachini Supunsala et al., 2021). The Social dimension include both the internal side of the company (workers) and the external one (customers, the social community at large) (EC, 2014). The G pillar, referring to governance, "forms the foundation of its ESG programs and the scaffolding on which policies addressing environmental and social issues are built" (File, 2023).

There are many studies affirming the existence of a positive relationship between ESG performance and Corporate Financial Performance, both single-country and multi-country analyses. In the main body of this study, the studies of the following authors are examined: Pulino et al. (2022), Wang and Sarkis (2017), Velte (2017), Dalal and Thaker (2019), Fei Wang (2024), Ding and Lee (2024), Kounduri et al. (2022), Xie et al. (2019), Bhaskaran et al. (2020), De Lucia et al. (2020). The findings of these studies all evidence a positive ESG-firms' performance relationship, where firms' performance is identified with measures such as ROA, ROE, EBIT and Tobins'Q. Table 1 in the main body of the dissertation provides a summary of the key findings of each of these studies.

Some studies show opposite results, indicating a negative relationship between ESG measures and financial performance, challenging the dominant view of a positive correlation. These studies include Landi and Sciarelli (2019), Brammer et al. (2006), Ruan and Liu (2021), Cerciello et al. (2023), Chen et al. (2021), Lin et al. (2019), Duque-Grisales and Aguilera-Caracuel (2021), Garcia and Orsato (2020). Table 2 in the main body of the thesis provides a summary of the key findings of each of these studies.

While some studies find positive effects of ESG practices on Corporate Financial Performance and other find negative effects, a third group of researchers identifies a mixed or neutral relationship between the variables. This third group includes the following studies: Han et al. (2016), Shakil et al. (2019), Giannopoulos et al. (2022), La Torre et al. (2021), Lopez-de-Silanes et al. (2020), Gartia et al. (2024), Narula et al. (2024), Alareeni and Hamdan (2020), Humphrey et al., (2012). Table 3 in the main text is dedicated to summarize the key findings of these studies.

2.2 ESG controversies and Corporate Financial Performance

Jucá et al. (2014) advanced a definition of ESG controversies, by saying that they "…arise following events or practices, associated with companies' products or operations, that may create risks for their reputation, due to their potential negative impacts related to environmental, social, or governance practices".

The topic of ESG controversies, and their relationship with a firm's performance and value has been the subject of a series of studies to date. Among the ones listed in this thesis, most of them indicate the presence of a negative relationship (Banjade, 2024; Brinette et al., 2023; Mendiratta et al., 2023; Yi and Tae-Wook, 2023; Ali et al., 2024; Nirino et al., 2021), while Melinda and Wardhani (2020) found that the ESG controversies score positively influence the value of a company. On the other hand, some studies have focused on the moderating effect played by ESG controversies on the relationship between ESG performance and firm performance or firm risk (Shakil, 2021; Hampl and Vágnerova Linnertová, 2024; García-Amate et al., 2023). Table 4 and 5 in the main body of this work, provide a summary of the studies describing the ESG-financial performance relationship and the moderating role of ESG controversies, respectively.

2.3 Utilities sector and ESG

With attention to ESG topics and practices growing more and more globally, the companies in the utilities sector are called to play a pivotal role in driving the transition toward an economically and socially sustainable future. As the backbone of essential services, these companies represent the industry on which firms from all the other sectors rely on to meet their ambitious sustainability goals (Bauer et al., 2023). This sector encompasses a diverse range of services, including energy, water services, waste

management and public transport, which are collectively regarded as "…essential to the transformation towards a sustainable economy and society" (Bauer et al., 2023).

On one hand, utilities companies are expected to create economic value for their shareholders and deliver public value for the society and communities. On the other hand, they must operate within social and environmental constraints while pursuing their goals. This dual mandate makes it imperative for utilities firms to disclose ESG information, which can serve as a crucial tool for demonstrating their commitment to sustainable practices (Nicolo et al., 2023).

Even if utilities sector companies are central in the transition toward a more sustainable future, the number of studies examining the relationship between the ESG performance of utilities firms and their CFP is quite low.

Generally speaking, the majority of authors so far concentrated their effort on studying the relationship between ESG and financial performance for what concerns energy companies (e.g., Patari et al., 2014; Zhao et al., 2018; Constantinescu et al., 2021; Adamkaite et al., 2022), leaving apart pure utilities companies, that received less attention in terms of how their ESG performance impacts their financial outcome. Only Şeker and Güngör (2022) concentrated exclusively on the utilities sector so far. Table 6 in the main text offers a view of the studies describing the relationship between ESG and financial measures in the context of utilities and energy firms.

III. HYPOTHESES DEVELOPMENT

The first objective of this study is to analyze the relationship between ESG scores and Corporate Financial Performance in the context of utilities companies. The first four hypothesis to be tested align with this purpose:

Hypothesis 1: *The overall ESG score has a positive and significant impact on utilities companies' financial performance.*

Hypothesis 2: *The Environmental pillar score has a positive and significant impact on utilities companies' financial performance.*

Hypothesis 3: *The Social pillar score has a positive and significant impact on utilities companies' financial performance.*

Hypothesis 4: *The Governance pillar score has a positive and significant impact on utilities companies' financial performance.*

The relationship between ESG performance and financial performance of utilities firms will be observed both by assessing the effect of the overall ESG score and the effect of the single Environmental, Social and Governance pillars on utilities firms' ROA and ROE. It is worth to disentangle ESG in its components since there have been studies whose findings revealed a diverse effect of the single E, S and G pillars on firms' performance (e.g., Han et al., 2016; Shakil et al., 2019; Gartia et al., 2024; Alareeni and Hamdan, 2020; Narula et al., 2024).

Moving forward, the next hypotheses aim to understand the effect of ESG controversies on the financial performance of utilities firms. The following hypothesis aim to contribute to research in this specific area:

Hypothesis 5: *The ESG controversies score has a negative and significant impact on utilities companies' financial performance.*

As with the previous hypotheses, also for this hypothesis ROA and ROE will be used as dependent variables, representing firms' performance. The independent variable will change, as the ESG score will be replaced by the ESG controversies score.

Lastly, the last hypothesis to be tested aim to understand whether ESG controversies moderate or not the relationship between ESG performance and utilities firms' performance. It is as follows:

Hypothesis 6: *The relationship between the overall ESG score and utilities companies' financial performance is moderated by the ESG controversies score.*

IV. DATA AND VARIABLES

The final sample is composed by 178 public companies with headquarters all around the world, with data spanning the last eight fiscal years. Tables 7 and 8 in the main text provide breakdowns of the companies according to their country and continent of headquarters, while Table 9 divides companies according to the type of utilities service that they offer, as suggested by the TRBC Industry Classification.

4.2. Variables

In the current study, two different dependent variables will be adopted for the hypotheses testing. These two variables are Return On Equity (ROE) and Return On Asset (ROA).

The independent variables employed in this study include the utilities firms' ESG score, the individual scores for the Environmental, Social and Governance pillars, and the ESG controversies score. The ESG score will act as independent variable in the regression models for Hypothesis 1 and 6. The individual Environmental, Social and Governance pillars scores will serve as independent variables for testing the Hypothesis 2, 3, and 4, respectively. Table 10 in the main text summarizes the different ESG pillars and categories. Lastly, the ESG controversies score will be used as independent variables in the regression models for Hypothesis 5 and 6, where their moderating effect on the relationship between the overall ESG score and utilities firms'financial performance will be evaluated. Table

The current study employs four control variables to ensure robustness in the regression models. The first control variable is Total Assets (in logarithmic form), that is one of the most popular proxies for a Firm Size (Li and Dang, 2013). The second control variable utilized is Total Debt to Equity ratio, representing the firm's Leverage (Iqbal and Usman, 2018). The third control variable employed is the Current Ratio. It is a liquidity ratio that creditors use to determine whether a firm has sufficient working capital to meet its short-term needs (Berk and DeMarzo, 2016). The fourth control variable presented is Asset Turnover. Asset Turnover is a ratio that measures how the assets owned by a company are operated in supporting the sales of the company itself. Table 18 in the main text provides a summary of the variables employed in the study, while Table 12 depicts the descriptive statistics of the variables employed.

V. MODELS AND ANALYSIS

5.1. Regression Models

To investigate the research objectives of this study, twelve different models have been developed. In all the equations presented below, "i" represents the firm and "t" the time period. Each hypothesis will be tested by running two different regression models: one with ROA as the dependent variable and the other with ROE serving in this role. This means that ROA and ROE will be used as alternative measures of firms' financial performance, as already done by multiple authors cited in this study (Kounduri et al., 2022; De Lucia et al., 2020; Lin et al., 2019; Alareeni and Hamdan, 2020; Li et al., 2024; Fometescu et al., 2024).

The first two models aim at studying the relationship between utilities firms' Corporate Financial Performance, as dependent variable, and the overall ESG score, as independent variable (Hypothesis 1). The regression models are expressed as follows:

[1]. $$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

[2]. $$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

The third and the fourth models are focused on exploring the relationship between utilities firms' Corporate Financial Performance and the firms' Environmental score (Hypothesis 2). The models are expressed in this way:

[3]. $$\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 EnvScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

[4]. $$\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 EnvScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$$

The fifth and the sixth models concern the relationship between utilities firm's financial performance and the Social score (Hypothesis 3). They are presented as follows:

[5]. $\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 SocScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$

[6]. $\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 SocScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$

Continuing, the next two models are intended to study the effect of the Governance score of utilities firms' Corporate Financial Performance (Hypothesis 4). The regression models are presented below:

[7]. $\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 GovScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$

[8]. $\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 GovScore_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$

Models nine and ten aim at studying the relationship existing between utilities firms' financial performance and the ESG controversies score (Hypothesis 5). The models are represented as follows:

[9]. $\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 ESGCont_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$

[10]. $\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 ESGCont_{it} + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$

The last two models are intended to explore whether the ESG controversies score moderate or not the relationship between the overall ESG score and utilities firms' performance (Hypothesis 6), by utilizing the interaction term ESG controversies score*ESG score. The models are expressed in this way:

[11]. $\boldsymbol{ROA_{it}} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGCont_{it} + \beta_3 (ESGCont_{it} * ESGScore_{it}) + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$

[12]. $\boldsymbol{ROE_{it}} = \beta_0 + \beta_1 ESGScore_{it} + \beta_2 ESGCont_{it} + \beta_3 (ESGCont_{it} * ESGScore_{it}) + \beta_2 FirmSize_{it} + \beta_3 Leverage_{it} + \beta_4 CurrentRatio_{it} + \beta_5 AssetTurnover_{it} + \varepsilon_{it}$

5.2 Correlation Results

Table 13 in the main text provides the Pearson correlation matrix for each variable employed in the study. While the correlation between ROA, ROE and the ESG scores is weak, the ESG scores are highly correlated among themselves. On the other end, the ESG controversies score has little correlation with all the other ESG related scores. Return On Assets and Return On Equity have a high correlation level, since they both reflect the financial performance of the firm. A moderate level of correlation is also observed between the individual E, S, and G Scores and the Firm Size.

5.3. Methodology for the Regression Models

The dataset adopted in this study is a *panel dataset*. As defined by Xu et al. (2017), a *panel dataset* is "a cross-sectional time-series dataset, which, ideally, provides repeated measurements of a certain number of variables over a period of time on observed units, such as individuals, households, firms, cities, and states". Different panel data analysis models exist, and when performing academic research, selecting the appropriate model is crucial. Ad-hoc tests, to be run on software for econometric analysis, have been developed to select the most appropriate panel data model based on the available dataset.

A procedure composed of several different steps has been followed to select the right panel data model to perform each of the regression models presented in sub-chapter 5.1. The details of the procedure can be found in the main text. As a result of it, all the regression models are run employing fixed effects and robust standard errors. Due to multicollinearity, the models to test Hypothesis 6 are run after having applied mean-centering (Iacobucci et al., 2016) to the independent variables ESG score and ESG controversies score.

5.4. Regression Analysis results

In the main text, Table 14 shows the results of the regression analysis for the first two models, Table 15 reports the results for models three to eight, Table 16 displays regression results for models nine and ten, and Table 17 includes regression results for the last two models.

The results show that the overall ESG score is significantly and negatively related to ROA, while the relationship with ROE is non-significant. The Environmental score has a negative and significant relationship with both ROA and ROE, while Social and Governance scores have non-significant relationships with both financial measures. The ESG controversies score has non-significant relationships with both ROA and ROE and does not moderate the relationship between the overall ESG Score and the financial measures.

VI. DISCUSSION

6.1. Conclusion 1: Impact of ESG Score and Individual Pillars Scores on the financial performance of utilities firms

Looking at the full list of studies cited in Chapter 1 of the main text, the results obtained in this study align with the findings of Ruan and Liu (2021) and Chen et al. (2021), who concluded that a negative and significant ESG-ROA relationship exists. In particular, Chen et al. (2021), highlighted that ESG fulfillment negatively impacts CFP in the short run. This might be the case of utilities companies, which are important actors in the transition toward a sustainable way of living, where renewable energy will substitute traditional energy sources (Bauer et al., 2023).

On the other hand, the non-significant relationship between the overall ESG Score and Return On Equity finds meaning when looking at the nature of utilities companies, which operate under stringent regulatory frameworks that often dictate allowable returns. In regulated utilities markets, companies often function as natural monopolies. In such situations, governmental agencies oversee the activity of utilities firms by approving the rates they can charge, preventing them from exploiting customers (Viscusi et al., 2018). If utilities firms incur in additional costs, such as expenses for implementing ESG initiatives, they can request permission to regulators to modify their

rates accordingly. This is a process typical of the "rate-of-return" regulation framework (Jamison, 2005) and ensures that companies can maintain a stable Return On Equity despite the additional costs. Since the dataset of the current study is composed by a multitude of utilities firms headquartered all around the world, the diverse regulatory environments across different countries may further explain the non-significant relationship between ESG performance and ROE.

The Environmental Score has a statistically significant and negative relationship with both Return On Assets and Return On Equity. Utilities firms are called to invest large amounts of money to improve their environmental performance, aligning their operations with sustainability principles and contributing to economic development (Fometescu et al., 2024). These intensified environmental investments, while reflecting the growing expectations of stakeholders, also highlight how capital allocation in the utilities sector might cause a reduction of short-term profit.

As for the Social and Governance Scores, no significant relationship was found with the dependent variables ROA and ROE. The cause behind this outcome may be the relatively narrow variation in social and governance practices within the regulated utilities sector, where established regulatory frameworks and industry norms ensure a baseline level of performance. As a consequence, while these two dimension of the ESG paradigm remain important for long-term risk management and stakeholders' relations, they might not directly impact short-term performance metrics such as ROA and ROE (Oikonomou et al., 2012).

The findings of the current study, while diverging from the dominant patterns observed in the broader ESG literature, highlight how the individual characteristics and institutional framework of each different sector can lead to different results in the ESG-CFP relationship, thus extending the existing knowledge on the topic and contributing to the ongoing discussion of how ESG scores and performance shape financial performance in highly regulated contexts.

6.2. Conclusion 2: Impact of ESG Controversies Score of the financial performance of utilities firms and the moderating effect on the ESG-firms' performance relationship

In the last four regression models, the ESG controversies score is not a significant independent variable. Two main reasons can explain the non-significance of the ESG controversies score as independent variable.

First, the insignificance may be attributed to regulatory mechanisms, such as the rate of return regulation mentioned above (Jamison, 2005), that might allow firms to pass additional costs associated with ESG Controversies directly on the customers, by adjusting charge rates accordingly. Second, the mean ESG Controversies Score for the sample of companies considered in this study is 91.35 out of 100, with a median score is 100, indicating a generally low level of controversies across the sample during the period of time considered. Having a large number of observations with similar values might lead to non-significance of the ESG Controversies Score when investing its relationship with ROA and ROE.

In general, it is not surprising that for companies operating in regulated or quasi-monopolistic frameworks, controversies may not escalate to a level able to influence and potentially compromise financial outcomes. The overall stability of this sector can be effective in reducing the financial consequences that ESG controversies may entail in other industries, such as the oil and gas sector (Shakil, 2021; García-Amate et al., 2023).

According to the dominant view in the literature, ESG controversies have a negative relationship with firm performance and value (Mendiratta et al., 2023; Nirino et al., 2021, Banjade, 2024; Brinette et al., 2023; Yi and Tae-Wook, 2023; Ali et al., 2024). On the other hand, there are scholars who found evidence of a positive relationship (Melinda and Wardhani, 2020). The current study contributes to the ongoing debate by offering a new perspective regarding the role of ESG controversies in a highly regulated sector. Whereas previous research noted that ESG controversies could impact a company's financial measures, such as ROA and Tobin's Q, the results of this study suggest that the same pattern does not materialize in the case of utilities, highlighting

sector-specific characteristics that can help buffering the negative effects normally associated with ESG controversies.

VII. MANAGERIAL IMPLICATIONS

The objective of this study, as the title states, was to study the interplay between financial, sustainability performance and ESG controversies in the utilities sector. The results of the study offer valuable insights for researchers and practitioners.

First, the negative and significant relationships between the Environmental score and firms'financial performance, suggests that while investing in environmental sustainability is essential for utilities firms, these investments can potentially impact the short-term profitability of the firms. Thus, utilities companies should carefully balance their environmental initiatives with their financial goals, in a way to ensure that future investments strain profitability as little as possible in the short run.

Second, since Social and Governance scores do not have a significant relationship with the performance metrics, it is suggested to managers in the utilities sector to prioritize compliance with industry norms and regulatory requirements, rather than exceeding these standards, and allocate the resources to areas of greater need.

Third, while ESG controversies do not significantly affect firms' performance, utilities firms should implement ESG risk management systems to detect and address potential issues early. The high average ESG controversies score of the sample (91.35) suggests that most of the companies already perform well in this sense. Maintaining this advantage to avoid an outlier status is key.

VIII. STUDY LIMITATIONS AND FURTHER RESEARCH

The study contained in this dissertation was conducted using rigorous methods and procedures. Nevertheless, it presents some limitations and leaves room for potential further research.

First, in this study financial performance has been measured through Return On Assets and Return On Equity. In the future, researchers might utilize other variables and proxies for firm performance.

Second, the sample of companies utilized in the current study is geographically heterogeneous. Future research could narrow the scope to one or few specific countries or regions.

Third, the sample adopted in this dissertation is entirely formed by public companies. In the future, it would be advantageous to include also non-public utilities companies in studies concerning the relationships they have with the ESG scores.

Fourth, in future studies, researchers could adopt scores from sources other than LSEG-Workspace (this study's source) to study the relationship between ESG scores and utilities firms' financial performance and observe whether the results confirm or contrast the findings of the current study.

Last, the dataset used for the purposes of this dissertation covered eight fiscal-years, which is a relatively limited time period. Future research might consider a longer data collection period, allowing for the study of the ESG-CFP relationship over a more extended time horizon.

To conclude, although the above-mentioned limitations might partially affect the analysis presented in this dissertation, the findings remain robust and offer valuable insights into the various relationships between ESG Scores and financial performance for companies in the utilities sector.

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