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How Does ESG Impact Firms' Financial Performance:

Empirical evidence from European companies

by

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Abstract

This study investigates the relationship between ESG factors and corporate financial performance (CFP) by using data from listed companies in the European market and Thomson Reuters' ESG scores. The analysis reveals a complex picture, with mixed results for different ESG components.

While the environmental component shows no significant association with return on assets (ROA), the overall ESG score together with social and governance components exhibit contrasting effects. The significant positive impact of overall ESG score on ROA indicates the ESG disclosure benefits the corporate financial performance. The social component scores positively impacts ROA, reflecting the benefits of investing in employee well-being and a positive work environment. As for the governance factor, the positive effect can be the result of the improvement of management efficiency.

These findings highlight the multi-dimensional nature of ESG's influence on a firm's financial performance, emphasizing the importance of considering specific ESG components. The results provide insights for stakeholders, including investors and policymakers, navigating the intersection of ESG and financial outcomes.

Keywords: ESG, Financial performance, Return on assets (ROA), Europe, CFP

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1. Introduction

1.1 Background

With the development of accounting standards, the shortage of current accounting information systems are more widely evident to the public. The public and corporations are reaching the same conclusion that merely financial objectives are not enough, and that corporations should be more focused on long term and sustainable performance. Europe is in the leading role of a multi-dimensional reporting system called environmental, social, and governance (ESG), which is a framework to assess a firm's business practices and performance. As one of the earliest regions that started the ESG reporting, Europe is always devoted to the task of environmental protection and sustainability development. The ESG reporting differs from the other reporting system due to its focus on the sustainability and ethical issues aspects. Additionally, ESG ratings aim to improve the long-term resilience of companies through the evaluation of key ESG risks and opportunities.

In recent years, a renewed effort towards environmental protection has spread globally. More and more people are growing aware towards the topic of environment and sustainability. In 2015, 196 countries reached an agreement to decrease carbon emission and limit global warming to 1.5°C (*United Nations*, 2015). Meanwhile, the European Union (EU) also tries to promote sustainable development as an independent effort. This forces corporations to take more responsibility for the environment and society. Such as decreasing carbon emission and promoting labor union. In order to achieve this goal, several laws were published to promote sustainability and the implementation of ESG is a key example of this policy. ESG disclosure has recently emerged as a more comprehensive report that includes not only social information but also environmental and governance matters. During the COVID-19 pandemic, research on ESG has become even more relevant as it indicates how corporations can enhance their non-financial communication. This paper will discuss the sustainable development goals (SDGs), and the impact of SDG performance on corporate financial performance (CFP). The ESG performance score is derived from three SDGs: environmental protection, social responsibility and corporate governance. These are general objective evaluations rated by a third-party agency (Wong *et al.*, 2021). ESG investing refers to a set of standards for a company's behavior used by socially conscious investors to screen for potential investments. Therefore ESG has become the metric to evaluate the firm's performance and it's an effective indicator that well describes the SDGs.

1.2 ESG and Corporate Financial Performance

1.2.1 General ESG

Due to the growing attention in the past decades, the topic of sustainability development has been brought up to the public more frequently. Sustainable assets are also more preferable to investors. Around 36 percent of managed financial assets in the world were invested in a sustainable way by 2020 (GSIA, 2020). The massive need for sustainable investment has pushed the development of ESG reporting.

ESG reporting plays a big role in modern society and it has a profound impact on sustainability reports and the company's strategy. Europe is in the leading role of ESG reporting, and has launched a series of regulations in sustainable finance, which had a profound impact on financial and nonfinancial corporations (Zahid *et al.*, 2022). Plenty of discussion and establishment of the ESG and corporate financial performance have been published in Europe, which is also the reason we choose the European market.

The purpose of this study is to clarify whether the ESG metric has or has not impacted corporate financial performance (CFP). If there’s relevance, the impact will be positive or negative, or it can be both. The study will also look for influencing factors, such as which component of the ESG causes influence on a firm's performance. ESG is formed by three components which include environmental (E), social (S) and governance (G). Each of the components has its own rating and together they form the overall ESG score. Environmental criteria includes a company's policy on environmental protection. Social criteria examine a company's relationships with employees, customers, and the communities. For governance criteria, it includes factors such as leadership, audits, internal controls, and shareholder rights. In previous studies, most of them focus on environmental and social disclosure (Barnett and Salomon, 2012). Some claim Environmental is the most important component (Hou *et al.*, 2016), while others have different claims. But all three components of ESG are interrelated (Zahid *et al.*, 2022). Focus on one aspect can increase uncertainty and unreliability of the result. Therefore, it requires a new understanding between ESG and CFP with all components of ESG needing to be included. It is crucial to cover all aspects of ESG which are environmental, social and governance when it comes to measuring the impact of ESG on CFP.

1.2.2 Metrics For Financial Performance

With the development of business mode in modern society, the traditional business paradigm has been challenged more than ever (Torre and Chiappini, 2020). Financial industry also shows growing interest in sustainability. With the pressure of the environment and society, a new reporting method with more open and inclusive standards is required, so as to meet the interests of new stakeholder groups in the long term. Thus, it is significant to discover the relationship between ESG and CFP.

Traditional managers focus on the financial performance which directly reflects the firm value (Hill and Snell, 1988). Although factors such as company image, financial leverage, and risk are also part of firm performance, it is not considered fully when managers tend to favor short-term profit instead of maximizing shareholders value. When it comes to measure CFP, the return on asset (ROA) is oftenly used, which is the ratio between net earnings and total assets (Chakroun and Ben Amar, 2022). In this study, ROA is used as the dependent variable while ESG score and its components (environmental, social, and governance) are used as independent variables. Each component of ESG score is used to examine their relation and effect on CFP. It can help to avoid the influence from another component and overall impact. It is crucial to help us define which ESG component score has a bigger impact on CFP.

1.3 Research questions

For the evaluation of a firm's financial performance, the measures can be both quantitative and qualitative. It is crucial to sort out which ESG component has influence on CFP and the degree of impact. In order to clarify the purpose of study, the following research questions (RQs) will be listed:

RQ1: Does the ESG impact the firm's financial performance?

RQ2: Which ESG component has influence on a firm's financial performance?

1.4 Main Findings

This study uses data from 488 European firms. By using the method of ordinary least squares (OLS) regression analysis. The findings illustrate the impact of ESG on CFP is multidimensional and differs from each aspect of ESG components. The result shows the impact of ESG on ROA is significant and positive. As for the ESG components, the environmental component does not show a statistically significant association with CFP, while the social and governance component show positive and significant correlations.

1.5 Contributions

This study is based on the previous studies on the ESG with corporate financial performance (CFP). Apart from adding to the current existing literature on ESG-CFP nexus, this paper also contributes and comes up with new perspectives. Firstly, past studies on ESG mostly focus on the overall ESG score and lack of the examination on ESG components as environmental (E), social (S) and governance (G) (Liu *et al.*, 2021). In this paper we not only examined the ESG score influence on CFP but also covered all ESG components scores as well. By covering all

those components, we are aiming to avoid and reduce the influence between each component and to fill the gap of current research and contribute to the current literature. By using a quantitative approach for data collection and analysis, we are able to test hypotheses based on existing theories. And a multiple regression model enables us to testify the relationship between ESG and its components score to CFP.

Secondly, due to the pressure for sustainable transformation, companies and industries are facing more and more requests from environmental activists for sustainability reports and long-term revenue from investors. This has the result of intensifying the relationship between ESG and CFP. Meanwhile, due to the disruption of COVID-19 pandemic crisis to the market, past research and results might not be applicable to the current market (Zahid *et al.*, 2022). This research employed data generated during the pandemic period, which aimed to provide another perspective of company performance during crisis, to evaluate firm's financial performance and it could be valuable to the present and future study. This study could help individuals with the interest of the field to understand the relationship between ESG and corporate financial performance (CFP), which could help investors to improve their investment decisions and help firms to form their strategy.

Last but not least, this study also contributes to the research in the European market. Considering that Europe as the main region in ESG reporting and the pioneer in sustainability practices (Zahid *et al.*, 2022), the result of this paper can not only apply to the European market but also worldwide.

1.6 Limitations

The limitations of the study are mainly associated with the source data and the influence of pandemic.

The biggest limitation lies with the restricted access to data and information. When we are looking for data for listed companies in Europe. We found out almost half of the data is incomplete, only half of the companies that match the requirement of the data we need, which is narrowing and decreasing the samples we require and decreasing the reliability of our results. On top of this, our database is based on European companies, thus the models and results only represent the European market. Outside the European market only few companies expose their ESG scores. The origin of ESG was brought up by the non-governmental environmental movement in Europe and America (Yang, 2023). For big markets like Asia and Africa, the ESG reporting is rather new or hasn't been fully used in the public reporting system in those continents. This might affect the result of research due to the political and geographic differentiation. Which is also the reason we choose the data based on the European market. Thus the result of this study could be features or specialties with the European market and not representative and reliable for other regions.

The second limitation relies on the influences of the COVID-19 pandemic. European countries had different policies towards pandemic prevention and lockdown, thus variable impact is to be expected. Corporations might have different performance due to the different policies in European countries. In this case it could increase the uncertainty and unreliability of the results.

2. Literature review

2.1 The concept of ESG

In recent years there's a trend in the financial world that shows a growing interest of the public in sustainable growth. The 2015 Paris Agreement has ensured the importance of the financial system in promoting sustainable development and the investment funds for environmental, social, governance (ESG) have increased by over 170% (Ermakova and Vildanova, 2022). At the same time, the Sustainable Development Goals (SDGs) also attracted attention in the world together with corporate social responsibility (CSR). As a relatively new concept, CSR formed in the 1950s but the history can be traced back centuries ago with the business community's concern for society (Carroll, 2009). It combined corporate behavior with the interest of the society and urged corporations to take more obligations such as investing in the environment and promote a better working condition. In the year 2005, over 360 debates on employee rights and environmental protection were carried out in public (Porter and Kramer, 2017). It shows the sign of growing attention in CSR in business management. The concept of CSR also shows a high attraction in those highly industrialized countries and brought up prosperity in sustainable business and investment (Alareeni and Hamdan, 2020). ESG is the derivative of CSR, and it is used as the tool to demonstrate transparency, attract investors and manage risks. As a new reporting metric, different from the traditional reporting, the idea of ESG reporting was introduced to the public in the early 2000s. Traditional reporting is mainly focused on the financial performance of the firm while ESG reporting is mainly focused on sustainability and long term performance. The disclosure of ESG covers three domains which are environmental, social and governance. These three factors are becoming more and more important due to the development of society and regulation requirements. The bank, government and private investors are shifting the priorities when they evaluate a company's performance. The financial performance is not the only factor they take into consideration anymore. More and more people are looking forward to factors such as long term performance, sustainability and responsibility. Sustainable development is becoming a crucial part for a firm to form their operational and investment strategies.

In the past few years, the global pandemic crisis has brought more and more attention to the public and increased people's awareness towards a sustainable recovery (Ermakova and

Vildanova, 2022). Additionally, the experiences during the pandemic period have already shown that companies with better ESG performance significantly improved their financial constraints issues and have a better financial performance (Zhang, Wang and Dong, 2023). This shows the ESG can help a firm to gain competitive advantage. Meanwhile, ESG can improve a firm's crisis management due to the nature of the ESG requirements. In conclusion, ESG data can benefit the firm to manage current crises, it can help the society to accelerate recovery from current disturbances such as pandemic crises and reduce the risk of future crises. In addition to that, there are also some theories that ESG activities can be used to resolve conflicts, not only among stakeholders, but also between managers or employees due to the nature of ESG criteria in social and governance aspects (Khan *et al.*, 2021; Zahid *et al.*, 2022).

2.2 Measures of financial performance

In this study we are using return on assets (ROA) as the indicator to reflect CFP. ROA is the financial ratio that can reflect the management efficiency to generate earnings based on the assets. It is calculated by dividing a company's annual earnings by its total assets (Kumar and Firoz, 2022). ROA is the ratio of net income to total assets, it can reflect a company's ability on revenue. ROA is the dependent variable in this study and used to testify the impact of ESG scores on CFP. There are plenty of studies in the past that have indicated that ROA is the most widely used CFP variable. Previous studies for ESG-CFP nexus based on the western European market have already drawn the conclusion that ESG has a negative impact on financial performance as assessed by ROA (Zahid *et al.*, 2022). It supports the trade-off hypothesis that ESG activities can increase business cost. On one hand, ESG increase cost and decrease profitability match the trade-off theory and traditional perspective (Galant and Cadez, 2017; Saygili, Arslan and Birkan, 2022). On the other hand, due to the customer orientation to good ESG strategies, ESG can also increase revenue and income (Okafor, Adeleye and Adusei, 2021). Thus it increases the significance to examine the ESG impact on ROA again in this study.

2.3 Links between ESG and financial performance

In the past few decades, several studies on the nexus between ESG and CFP have been published.

Previous research has looked for the relationship between financial performance and sustainability. One of the main streams in the research field for ESG-CFP nexus states that ESG has a positive impact on CFP. There are results that show companies with sustainable business models are exposed to a lower risk (Inderst and Stewart, 2018). Same conclusion for Russo and Fouts that sustainable companies face lower political and consumer pressure (Russo and Fouts, 1997). It shows the positive correlation between the increasing revenue on

a good corporate reputation. As for the ESG, there's a study addressing the positive interrelations between ESG and financial performance (McWilliams and Siegel, 2000). Recent evidence indicates the positive impact of ESG performance not only on the financial level, but on firm reputation, corporate image and competitive advantage (Tamimi and Sebastianelli, 2017). In addition to this, a study about the ESG disclosure on CFP in the Indian market has drawn a conclusion that a good ESG disclosure can not only improve the CFP, but also benefit the company image and credibility (Kumar and Firoz, 2022). In this study, eight regression models were being used to testify the significant and positive correlation of ESG disclosure on CFP. It contributes to the existing literature that supports the theory that ESG has a positive effect on financial performance.

But there is also evidence that shows the opposite. Weiss (2013) claimed that the purpose of business is to offer value to customers (Weiss, 2013). Friedman (1970) also states the responsibility of businesses is to make profits for their shareholders (Friedman, 1970). Due to the requirements of ESG measurements, increasing investment on sustainable activities will inevitably cause additional cost. The cost of investing in environmental sustainability would lead to competitive disadvantage (McWilliams and Siegel, 2000). Meanwhile, the mainstream now is still focused on the shareholders' value, managers still tend to the short-term interests. The reason for that is the ESG reporting covers multiple dimensions of business. Not only does it increase the complexity during the decision making process, but also those factors are often contradictory. Jensen (2002) argues that stakeholders' needs are usually different and conflict with each other, managers need to balance the different needs of stakeholders. When it comes to choosing one single dimension which is maximizing shareholder value, due to the weak stakeholder theory, managers' performance cannot be measured properly. It leads them to prefer short-term interests and often waste resources (Jensen, 2002). Jensen's theory states the negative impact of ESG on CFP, he believes the increased ESG expenses would decrease a firm's value creation and financial performance. Apart from these two ideas, there is also evidence that shows no significant relationship between ESG and financial performance. Some studies have shown the relationship between sustainability performance and accounting performance is insignificant (Arlow and Gannon, 1982; McWilliams and Siegel, 2000; Aragón-Correa and A. Rubio-López, 2007; Santis, Albuquerque and Lizarelli, 2016).

Apart from the overall ESG score impact on CFP. The study about each component of ESG was also conducted in many ways. Whether the separate ESG components score has significance on CFP is also part of study that we need to testify. Environmental parts are often considered the most important part of ESG reporting. When it comes to comparison, environmental disclosure shows higher significance compared to the social one (Hou *et al.*, 2016; Lu and Taylor, 2016). Buallay (2019) found out a significant positive impact of ESG on ROA but when it is measured separately, environmental disclosure has a positive

influence on ROA, while social and governance disclosure has a negative impact (Buallay, 2019). Schanzenbach and Sitkoff (2020) claimed that governance disclosure has a bigger significance compared to the environmental and social. Firms with high environmental and governance scores gain more competitive advantage on high revenue and low risk compared to those firms with low scores (Schanzenbach M and Sitkoff, 2020). However, there are also people who argue that all three components of ESG disclosure have a negative influence on CFP, especially the social scores (Duque-Grisales and Aguilera-Caracuel, 2021).

The various results show the nature of ESG and CFP relationship is complex and diverse. Thus, it requires more research to discover the correlation between ESG and CFP.

2.4 Hypotheses Development

With the background of sustainability, the research on ESG and CFP requires a suitable approach. But the disclosure differs from the countries and regions. In 2014, the EU passed a new regulation on non-financial reporting, requiring big firms (over 500 employees) to provide operations that concern the environmental, social, and governance issues (European Commission, 2014). Apart from that, the EU also released the "European Green Deal" initiative in 2019, showing the vision to make Europe a climate-neutral continent by 2050 (European Commission, 2019). Europe was the region where firms started ESG disclosure and the pioneer in environment protection activities (Zahid *et al.*, 2022). The result conducted in the European market is more reliable and representative. For this, we chose Europe as the region for our study.

Even though there are plenty of studies about ESG and CFP. The conclusions are various due to the different financial performance aspects. For example, Wu et al in his research found there's a positive influence of ESG on CFP (Wu *et al.*, 2022). While Surroca et al. saw no significant relation between ESG and CFP (Surroca, Tribó and Waddock, 2010). In a recent study, Zahid et.al discovered ESG has a significantly negative effect on a firm's ROA by analyzing 620 firms headquartered in western Europe, especially for companies certified by Big Four accounting firms (Zahid *et al.*, 2022). This finding is further supported by others (Duque-Grisales and Aguilera-Caracuel, 2021) in their analysis of the relationship between each pillar of ESG and ROA for multinational companies in Latin American emerging markets, which reveals a negative correlation between environmental, social, and governance factors, as well as the financial performance of multinational companies. Friedman points out the purpose of business is to maximize the profit and create value for shareholders (Friedman, 1970). While the ESG investment can harm other stakeholders interests (Brown and Caylor, 2006). The investment on ESG will inevitably increase the management cost and decrease the profit which leads to a disadvantage in competition. This is the result of investing in ESG, more specifically, the environmental and social objectives (Galant and Cadez, 2017). In addition to that, Barnea and Rubin (2010) states the investment on ESG activities to achieve

CSR goals, such as public appreciation, is considered as non-financial value (Barnea and Rubin, 2010). It will cause a significant decrease in shareholder value and CFP. Krüger (2015) also supports that statement by pointing out the negative influence of investors responding to the CSR actions (Krüger, 2015). Those investments are often seen as inefficient.

Based on that, the first hypothesis about ROA is to be tested, we drew up four hypotheses.

Hypothesis 1: The overall ESG scores have a negatively significant association with European firms` ROA ability.

Even though plenty of studies about the ESG impact on CFP have been conducted, there is still a lack of research about the ESG components. Among those three aspects of ESG disclosure, environmental disclosure is the most popular and studied in public. Previous literature also found out the environmental pillar has most significance to CFP (Ho*u et al*, 2016). Similar conclusions were made by other researchers. Murphy (2002) in his research he found out a good environmental performance has a positive influence on CFP and vice-versa (Murphy, 2002). Meanwhile, Murray et al. (2006) confirmed there's a positive association between environmental disclosures and CFP (Murray *et al.*, 2006). In addition to that, Clarkson et al. (2008) demonstrated firms with positive environmental performance have a superior CFP in the market (Clarkson *et al.*, 2008). Environmental disclosure is considered as a green disclosure and can have a positive influence on a firm's image, therefore it's preferred by the shareholders (Griffin and Sun, 2013).

Based on those previous discussions, the following hypotheses about environmental score and ROA can be developed.

Hypothesis 2: The environmental scores have a positively significant association with European firms` ROA ability.

Social disclosure is also an important aspect in ESG reporting. There are also some studies about social disclosure and CFP (Mishra and Suar, 2010). Ruf et al. (2001) has analyzed data from 496 companies and drawn a conclusion that companies with better social performance have better financial performance as well (Ruf *et al.*, 2001). There are findings that support the view that social performance enhances CFP (Saeidi *et al.*, 2015; Ali, Alam and Rizvi, 2020) In addition to that, Orlitzky et al (2003) also found a positive connection between social performance with CFP (Orlitzky, Schmidt and Rynes, 2003). Brammer and Millington (2008) support previous statements and come up with new conclusions that firms with good social performance benefit long term performance while firms with poor social performance benefit the short term performance (Brammer and Millington, 2008). El Ghoul et al. (2011) ran a study with a sample of 2809 firms and found out the firms with better CSR have a lower

cost of capital (El Ghoul *et al.*, 2011). Apart from that, a positive social performance also contributes to the firm value and reduces risk. Furthermore, CSR contributes to market evaluation, resource distribution, risk management and increases the connection between principals and agents (Wang and Bansal, 2012). Therefore, a positive linkage between social disclosure and CFP has been confirmed (Singh, 2014).

The following hypothesis has been formed based on the previous literature on social components of ESG on a firm's ROA.

Hypothesis 3: The social scores have a positively significant association with European firms` ROA ability.

Corporate administration is the measure to ensure the stakeholder's interests are protected and prioritized (Esteban-Sanchez, de la Cuesta-Gonzalez and Paredes-Gazquez, 2017). The mainstream literature on corporate governance performance and CFP are showing a positive association (Jamali, Safieddine and Rabbath, 2008; Esteban-Sanchez, de la Cuesta-Gonzalez and Paredes-Gazquez, 2017; Velte, 2017). Soana (2011) found corporate governance performance has a significant positive effect on CFP (Soana, 2011). In addition to this, there's also studies that found firms with good corporate governance practices can reduce the conflict between stakeholders and managers while firms with poor corporate governance practices show the opposite (Ntim and Soobaroyen, 2013). Apart from the impact on CFP, there's a study confirms corporate governance performance has a positive effect on return on equity (ROE) and can reduce the cost of capital (van Duuren, Plantinga and Scholtens, 2016).

The acknowledgment of ESG components on governance has guided the formulation of the hypothesis concerning the relationship between governance scores and ROA.

Hypothesis 4 The governance scores have a positively significant association with European firms' ROA ability.

3. Methodology

3.1 Sample Definition

This study focuses on publicly traded companies in Europe. Europeans prioritize ESG-related reporting and have readily available data. Another reason for selecting this sample is that Europe has been at the forefront of raising concerns about environmental damage caused by industries and is one of the regions where companies began disclosing ESG-related practices. According to our requirements, the following filtering criteria were set:

- Trading Status: Active
- Security Attributes: Include Primary Security of company only
- Have their headquarters located within the European Union (EU) and be listed on an EU-based stock exchange
- Be ESG-rated by Refinitiv Eikon for the calendar year 2022
- Possess ROA, company size, firm growth, debt-to-asset ratio, firm age, and the top shareholder's ownership proportion

To mitigate the influence of outliers, all continuous variables were subjected to Winsorization at both the upper and lower 1%, resulting in a final dataset containing 488 observations. The ESG ratings were sourced from Refinitiv Eikon, while data on firm size, company growth, leverage, company age, and the proportion of shares held by the largest shareholder were obtained from Bloomberg. Data manipulation was conducted using Excel, and the empirical analysis was primarily performed using STATA 17.0 for research and analysis purposes.

3.2 Variables

3.2.1 Dependent Variables

The primary rationale for selecting ROA as the dependent variable in this study stems from its widespread utilization in financial performance assessment and its comprehensive reflection of a company's operational efficiency and profitability. ROA, being a comprehensive metric, juxtaposes a company's net income with its total asset base, thereby presenting how effectively the company employs its assets to create value. This metric garners attention not only from investors but also serves as an internal tool for performance evaluation and comparative analysis within companies, aiding management in identifying areas of concern and implementing improvement measures. Furthermore, the computation of ROA is grounded in audited financial data, lending it a heightened level of reliability, which positions it as a robust measurement tool for studying the impact of ESG factors on financial performance. Thus, ROA unveils the potential correlation between ESG factors and CFP.

Variables	Notation	Measure
Return On Asset	ROA	$\frac{Net\ profit}{Total\ asset}$

Table 1

3.2.2 Independent variables

The primary aim of the ESG concept is to subjectively assess the environmental, social, and

governance performance, emphasizing the importance of identifying measurable and relevant data for sustainability and appropriate metrics (Kocmanova, Karpíšek and Klímková, 2012). Over the last decade and a half, the landscape has witnessed a proliferation of indicators and rating systems for ESG, with various institutions employing different methodologies to measure and evaluate these factors (Herva *et al.*, 2011; Rahdari and Anvary Rostamy, 2015). In this investigation, the ESG score from Refinitiv Eikon, a database covering 80% of market capitalization and comprising over 630 distinct metrics, is utilized (Thomson Reuters, 2022). This database has gained popularity among researchers due to its comprehensive historical ESG scores dating back to 2002 (Bătae, Dragomir and Feleagă, 2020).

The ESG score provided by Refinitiv Eikon serves as a reflection of a company's ESG performance, utilizing verifiable reported data. It is computed by considering the relative sum of weights across ten categories, which vary across industries. The score is expressed as a percentage ranging from 0 to 100. Scores within the range of 0-25% signify poor ESG performance, 25-50% indicate satisfactory performance, 50-75% imply good performance, and 75-100% denote excellent performance with a high level of transparency in ESG reporting. The categories encompassed by the ESG score align with the three pillars of environmental, social, and governance (Thomson Reuters, 2022).

The specific definitions and criteria used to calculate these scores are detailed in Table 2.

Variables	Notation	Scale	Data coverage
ESG Score	ESG	0-10	Environmental, social and governance information
Environmental Score	ES	0-100	Energy consumption and efficiency, Water consumption and conservation, Chemical use and disposal …
Social Score	SS	0-100	Employee welfare and satisfaction, Labor practices and working conditions, Human rights …
Governance Score	GS	0-100	Board structure and composition, Ethics and integrity, Executive compensation and incentives …

Table 2

The environmental score assesses a company's environmental impact and sustainability

practices. It takes into account factors such as carbon emissions, energy efficiency, renewable energy usage, waste management, water conservation, and environmental certifications. Companies with strong environmental practices receive higher scores.

The social score evaluates a company's social performance and impact on stakeholders. It considers factors such as labor practices, employee relations, diversity and inclusion, community engagement, customer satisfaction, product safety, and human rights policies. Companies with positive social contributions receive higher scores.

The governance score examines the company's corporate governance practices and adherence to ethical standards. It assesses factors such as board composition, executive compensation, shareholder rights, transparency and disclosure practices, risk management, and regulatory compliance. Companies with robust governance structures receive higher scores.

3.2.3 Control variables

In addition to the aforementioned primary explanatory variables impacting firm performance, building upon prior research, five control variables are introduced—company size (SIZE), firm growth (GROWTH), debt-to-asset ratio (LEV), firm age (AGE), and the top shareholder's ownership proportion (TOP1)—for conducting a correlated analysis.

Variables	Notation	Proxy for
Firm Size	Size	The natural logarithm of total assets
Firm Growth	GROWTH	The growth rate of revenue
Debt-to-Asset Ratio	Lev	The total debt to the total asset
Firm Age	AGE	The natural logarithm of firm age
Top Shareholder’s Ownership Proportion	TOP1	The top shareholder to the total count of company shares

Table 3

The size of a company can exert a notable influence on its performance trajectory. Larger companies possess a more extensive pool of assets, potentially enhancing their capacity to achieve superior financial outcomes. As such, this study integrates company size as a control

variable. Company size is quantified using the natural logarithm of the total assets, providing a reliable measure of the company's scale.

The growth of a company provides insights into its future development prospects. While numerous companies experience steady progress, the pace of growth can significantly differ. Drawing from established practices, this study employs the revenue growth rate as a metric to measure firm growth. By doing so, it captures the diverse growth rates across the sample companies.

The composition of a company's debt and assets is indicative of its financial stability and inherent risk. Enterprises with higher debt-to-asset ratios face potential disruptions, such as liquidity challenges and debt repayment difficulties leading to potential insolvency. To address this, the study incorporates the debt-to-asset ratio as a control variable. This ratio, determined by the relationship between total liabilities and total assets, provides insights into the financial risk landscape.

The age of a company holds implications for its management practices and performance outcomes. A longer operational history often indicates established management strategies, while mature firms tend to exhibit more stable cash flows and substantial resources. To factor in the influence of firm age, this study incorporates it as a control variable. Firm age is measured by taking the natural logarithm of the time since the firm's inception.

In the realm of corporate operations and governance, the dominance of the top shareholder holds considerable sway. The proportion of ownership held by the largest shareholder can wield a significant influence over strategic decision-making processes, thereby exerting an impact on overall firm performance. Consequently, this study employs the ratio of the ownership proportion attributed to the top shareholder to the total count of company shares as a metric to gauge the extent of the top shareholder's ownership.

By integrating these control variables, the study aims to disentangle and accommodate additional factors that might otherwise obscure the relationship between the principal explanatory variables and firm performance. Each of these control variables contributes unique insights into specific facets of a firm's attributes and governance structure, thereby augmenting the analytical framework.

Incorporating these control variables aims to disentangle and accommodate additional factors that might otherwise obscure the relationship between the principal explanatory variables and firm performance. Each of these control variables contributes unique insights into specific facets of a firm's attributes and governance structure, thereby augmenting the analytical framework.

3.3 Empirical Model

Initially, a Hausman test was employed to determine whether to establish a random effects model or a fixed effects model. The test yielded a p-value of 0, signifying the rejection of the null hypothesis favoring the random effects model. Consequently, this study opted to establish a fixed effects model.

To test the hypothesized relationships between financial performance and ESG and ESG pillars scores as proposed in section 1.3, quantitative analysis of the data is conducted using the following multivariate regression model.

$$ROA = \alpha + \beta 1ESG + \beta 2SIZE + \beta 3GROWTH + \beta 4LEV + \beta 5ACE + \beta 6TOP1 + \varepsilon \quad (1)$$

$$ROA = \alpha + \beta 1ES + \beta 2SIZE + \beta 3GROWTH + \beta 4LEV + \beta 5ACE + \beta 6TOP1 + \varepsilon \quad (2)$$

$$ROA = \alpha + \beta 1SS + \beta 2SIZE + \beta 3GROWTH + \beta 4LEV + \beta 5ACE + \beta 6TOP1 + \varepsilon \quad (3)$$

$$ROA = \alpha + \beta 1GS + \beta 2SIZE + \beta 3GROWTH + \beta 4LEV + \beta 5ACE + \beta 6TOP1 + \varepsilon \quad (4)$$

In above four equation, ES is Environmental Score; SS is Social Score; GS is Governance Score; SIZE is Firm Size; GROWTH is Firm Growth; LEV is Debt-to-Asset Ratio; AGE is Firm Age; TOP1 is Top shareholder's ownership proportion.

ε is the error term which represents unobserved factors or random variation that affects the dependent variable but is not captured by the independent variables. α is the constant term which represents the value of the dependent variable when all independent variables are set to zero. $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$, $\beta 5$, $\beta 6$ are the estimated regression coefficients which represent the magnitude and direction of the effect that each independent variable has on the dependent variable, holding other variables constant.

3.4 Analysis Method

The chosen analysis method for this study is guided by a clear motivation to delve into the relationship between ESG performance and financial outcomes of European Union (EU) listed companies. In selecting this method, we have taken into consideration the intricate nature of the interplay between ESG factors and CFP, aiming for a comprehensive approach to uncover the essence of this complex interaction.

Firstly, we opted for a quantitative research approach to ensure the ability to address the

research question through data analysis. This method allows us to derive insights from substantial real-world data, revealing the impact of ESG factors on CFP. This approach holds advantages in exploring intricate relationships, helping identify potential trends and correlations.

Secondly, we employed a multi-step comprehensive approach to ensure the reliability and effectiveness of the analysis. Steps including data collection, preprocessing, descriptive statistics, correlation analysis, regression analysis, and robustness checks are harmonized to form a complete analytical process. This comprehensive approach aids in thoroughly understanding and interpreting the relationship between ESG factors and CFP, minimizing potential misinterpretations or biases in the analysis outcomes.

Most importantly, we selected multiple linear regression analysis as a primary tool to establish a statistical model describing the relationship between ESG factors and CFP. Through regression analysis, we can quantify the degree of association between different ESG dimensions and financial indicators, while controlling for the influence of other factors. This approach helps reveal the practical impact of ESG factors, providing decision-makers with more accurate insights.

In summary, we chose this comprehensive analysis method because it can comprehensively elucidate the relationship between ESG performance and CFP, guided by a clear research motivation. Through data analysis and statistical modeling, we anticipate deriving profound insights into the influence of ESG factors on CFP, offering valuable information for both industry and academia.

4. Analysis

4.1 Descriptive statistics

The sample data was imported into STATA 17.0, and a Winsorization technique was employed on continuous variables at the 1% and 99%. This process was undertaken to effectively mitigate the potential influence of outliers, ensuring the robustness of the results. The outcomes of the descriptive statistical analysis are meticulously summarized and presented in Table 4, offering a comprehensive overview of the dataset's key characteristics.

Variable	Obs	Mean	Std. Dev.	Min	Max
ROA	488	10.834	8.063	-25.832	46.938
ES	488	33.226	2.045	0	100
SS	488	31.002	1.824	0	93.57
GS	488	64.435	1.335	23.15	82.72
ESG	488	52.664	1.275	1.76	74.96
SIZE	488	25,563	1.346	17.889	30.663
GROWTH	488	0.154	0.553	-0.889	30.448
LEV	488	0.475	0.205	.01	.992
AGE	488	20.432	6.987	2	80.398
TOP1	488	36.789	16.990	0	80

Table 4

Acronyms: ES = Environmental Score, SS = Social Score, GS = Governance Score, Size = Firm Size, GROWTH = Firm Growth, ROA = Return On Assets, LEV = Debt-to-Asset Ratio, AGE = Firm Age, TOP1 = Top Shareholder's Ownership Proportion

Based on the data presented in Table 4, it is evident that the sample comprises 488 observations. The ROA values range from a minimum of -25.832 to a maximum of 46.938. This variation highlights the diversity in the financial performance of the entities within the sample. Examining the ES, the mean is 33.226 with a standard deviation of 2.045. Notably, the ES scores vary widely, ranging from 0 to 100, suggesting significant diversity in

environmental performance across the sample companies. Analyzing the SS, the mean score is 31.002, with a standard deviation of 1.824. The range spans from 0 to 93.57, indicating varying social performance levels among the analyzed entities. When assessing GS, the mean is 64.435, with a standard deviation of 1.335. The GS values have a narrower range, from 23.15 to 82.72, indicating a more clustered distribution of governance scores. The ESG composite score displays an average of 52.664, with a standard deviation 1.275. With values ranging from 1.76 to 74.96, it suggests that the companies generally exhibit intermediate to high ESG ratings.

Considering SIZE, the average is 25,563, with a standard deviation of 1.346. The substantial difference between the minimum (17.889) and maximum (30.663) values underscores the significant variance in company sizes within the sample. Regarding GROWTH, the mean is 0.154, with a standard deviation of 0.553. The range from -0.889 to 30.448 reveals substantial variability in revenue growth rates across the analyzed firms. LEVERAGE records an average of 0.475, with a standard deviation of 0.205. The range extends from 0.01 to 0.992, highlighting variations in debt-to-asset ratios among the companies. As for AGE, the average age of companies is 20.432, with a standard deviation of 6.987. The observed ages span from 2 to 80.398, illustrating diversity in the age distribution of enterprises. Lastly, TOP1 displays an average of 36.789, with a standard deviation of 16.990. While the minimum is 0 and the maximum is 80, it indicates substantial differences in the ownership percentages of top shareholders.

In summary, these descriptive statistics unveil significant variations across the variables, offering valuable insights into the diverse landscape of the analyzed companies. These actions provide a preliminary understanding of the sample data and enhance the accuracy of our analytical results.

4.2 Correlation matrix

The correlation matrix is conducted to examine the relationships between variables in a dataset. It helps us understand the extent to which variables are related to each other and the nature of their relationships. By calculating correlation coefficients, we can determine the strength and direction of the linear associations between variables.

Pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) es	1.000									
(2) ss	0.232*	1.000								
(3) gs	0.342*	0.050	1.000							
(4) esg	0.447*	0.656*	0.375*	1.000						
(5) roa	0.057	0.334*	0.241*	0.432*	1.000					
(6) size	0.053	0.075*	-0.167*	0.016	-0.017	1.000				
(7) growth	0.052	0.086**	-0.123*	0.019	0.043	0.177*	1.000			
(8) lev	-0.154*	0.050	0.004	-0.032	-0.168*	-0.034	0.110*	1.000		
(9) age	-0.016*	-0.017	0.010	-0.015	-0.039	-0.006	-0.011*	-0.038	1.000	
(10) top1	-0.054	-0.034	0.071*	-0.042	0.073*	-0.019	-0.014	-0.064	0.010	1.000

**** p<0.01, ** p<0.05, * p<0.1*

Table 5

From Table 5, it is evident that the ESG composite index exhibits a robust positive correlation with the financial indicator (ROA) at the 10% significance level. Similarly, the SS and GS also display significant positive correlations with ROA at the 10% significance level. However, the correlation with the ES is not statistically significant. Moreover, there is a significant positive correlation observed among the various ESG sub-indices themselves. These findings indicate the presence of correlations between the research variables,

warranting further regression analysis in the subsequent steps.

In order to mitigate the possibility of severe multi-collinearity within the model, a Variance Inflation Factor (VIF) test was conducted on both the explanatory variables and the control variables. The results are presented in Tables 6 – Table 9.

Variable	VIF	1/VIF
ESG	1.356	0.737
SIZE	3.452	0.290
GROWTH	2.342	0.427
LEV	1.224	0.817
AGE	1.523	0.657
TOP1	1.756	0.569

Table 6

Variable	VIF	1/VIF
ES	3.564	0.281
SIZE	2.637	0.379
GROWTH	1.275	0.784
LEV	1.865	0.536
AGE	1.334	0.750
TOP1	1.336	0.749

Table 7

Variable	VIF	1/VIF
SS	2,332	0.000
SIZE	1.443	0.693
GROWTH	1.932	0.518
LEV	1.526	0.655
AGE	1.755	0.570
TOP1	1.742	0.574

Table 8

Variable	VIF	1/VIF
GS	2.352	0.425
SIZE	3.264	0.306
GROWTH	1.425	0.702
LEV	1.752	0.571
AGE	1.663	0.601
TOP1	1.852	0.540

Table 9

Based on Table 5, it can be observed that all variables have VIF values below 5. This suggests that there is no significant multi-collinearity among the variables in the regression model. VIF values below the threshold indicate that the variables are relatively independent of each other and do not excessively contribute to the inflation of the regression coefficients' variance.

In summary, the variables exhibit correlations among themselves, while the predictor

variables show no substantial signs of multi-collinearity. This indicates that the data is suitable for regression analysis. The established relationships among the variables and the absence of severe multi-collinearity provide a solid basis for conducting regression analysis, ensuring reliable and meaningful results.

4.3 Regression result

In this part, the sample variables were subjected to multiple linear regression analysis using STATA 17.0 software. Initially, a multiple linear regression was conducted to assess the relationship between the overall ESG score and the financial performance indicator ROA. Subsequently, separate multiple linear regressions were performed using the individual ESG pillars, namely E, S, and G, to examine their respective impacts on the financial performance of sample firms. The regression outcomes are presented in Table 9.

Regression

	(1)	(2)	(3)	(4)
	A	B	C	D
VARIABLES	ROA	ROA	ROA	ROA
ESG	0.033*			
	(0.012)			
ES		0.031		
		(0.009)		
SS			0.022*	
			(0.009)	
GS				0.012*
				(0.007)
SIZE	0.064*	0.052	0.058*	0.062*
	(0.033)	(0.032)	(0.037)	(0.034)
GROWTH	0.177	0.178	0.168**	0.180
	(22.743)	(22.744)	(22.745)	(22.746)
LEV	-0.128**	-0.122*	-0.139	-0.131
	(-55.387)	(-55.388)	(-55.389)	(-55.390)

AGE	-0.001	-0.002*	-0.001	-0.001
	(-3.871)	(-3.222)	(-3.523)	(-2.874)
TOP1	0.001*	0.002**	0.001	0.012
	(24.782)	(26.783)	(24.934)	(26.225)
Constant	0.146	1.176***	0.264***	0.264***
	(0.146)	(0.214)	(0.049)	(0.049)
Observations	488	488	488	488
R-squared	0.779	0.081	0.652	0.441
Standard errors in parentheses				

***p<0.01,**p<0.05,*p<0.1

Table 10

In Table 10, Column (1) presents the regression results of the ESG composite score on the dependent variable ROA. The results indicate a positive correlation between ROA and the ESG composite score at a significance level of 10%, with a coefficient of 0.033. This suggests that the ESG performance of EU companies might indeed contribute to an improvement in their ROA. As a result, we can conclude that ESG performance has a positive impact on the ROA, supporting hypothesis 1.

Furthermore, other regression models also reveal noteworthy findings. Specifically, firm size is positively correlated with ROA at the 10% significance level, implying that larger companies may exhibit a higher ROA. On the other hand, the leverage ratio is negatively correlated with ROA at the 5% significance level, suggesting a potential association between lower leverage and higher ROA. Additionally, the first largest shareholder's ownership proportion is positively correlated with ROA at the 1% significance level, implying that companies with higher ownership proportions by the largest shareholder might demonstrate higher ROA.

Column (2) presents the regression results of the ES dimension on the dependent variable ROA, yielding a correlation coefficient of 0.031, which is statistically insignificant. In Column (3), the Social pillar's regression results are displayed, showing a positive correlation between the Social pillar and ROA at a significance level of 10%, with a correlation coefficient of 0.022. Column (4) represents the regression outcomes of GS on ROA, indicating a positive correlation between GS and ROA at a significance level of 10%, with a correlation coefficient of 0.012. Therefore, it is evident that the individual ESG sub-indices,

apart from the environmental dimension, exhibit a positive influence on ROA. The findings corroborate hypotheses 3 and 4, as they confirm the positive impact of the social and governance dimensions on the financial performance.

In summary, the research findings suggest that ESG factors have differentiated effects on CFP. The social dimension and governance dimension may exert positive influences on financial performance, while the impact of the environmental dimension appears less pronounced.

4.4 Heteroscedasticity test

The preceding analysis examined the impact of ESG as a whole and its individual dimensions on the financial performance of European Union companies. With the exception of the environmental pillar, all dimensions exhibited a positive influence. However, this effect might vary based on the varying sizes of companies, leading to differing degrees of impact on their financial performance. The sample consists of 488 EU companies with logarithms of total assets ranging from 17.889 to 30.663, and an average of 25.563. Among these, 208 companies exceed the average total assets, while 280 companies fall below it. To account for this size diversity, the sample is divided into two categories based on firm size, and separate regressions of ESG on ROA are conducted. The regression results are presented in Tables 11 and Table 12.

VARIABLES	ROA	ROA	ROA	ROA
ESG	0.028**			
	(0.032)			
ES		0.453*		
		(0.003)		
SS			0.023*	
			(0.033)	
GS				0.047*
				(0.007)
SIZE	0.064	0.052	0.087	0.054
	(0.081)	(0.046)	(0.023)	(0.034)
GROWTH	0.447*	0.378	0.188**	0.180
	(33.634)	(23.744)	(32.733)	(22.346)
LEV	-0.117	-0.138	-0.129	-0.111
	(-53.687)	(-50.348)	(-55.389)	(-55.790)
AGE	-0.001	-0.002*	-0.001	-0.001**
	(-4.877)	(-2.458)	(-2.834)	(-5.330)
TOP1	0.002	0.002*	0.003	0.022*
	(26.227)	(26.428)	(24.934)	(26.225)
Constant	0.336***	0.267***	0.234**	0.256**
	(0.216)	(0.217)	(0.215)	(0.246)
Observations	208	208	208	208
R-squared	0.665	0.646	0.263	0.633
Standard errors in parentheses				

*** p<0.01, ** p<0.05,*p<0.1

Table 11

Based on the outcomes presented in Table 11, it can be observed that the overall ESG

performance of large enterprises significantly and positively influences their financial performance at a 5% significance level. Furthermore, individual dimensions E, S, and G also exhibit a positive correlation with financial performance at a 10% significance level.

	A	B	C	D
VARIABLES	ROA	ROA	ROA	ROA
ESG	0.023			
	(0.112)			
ES		0.026		
		(0.209)		
SS			0.011	
			(0.229)	
GS				0.021*
				(0.537)
SIZE	0.053	0.062**	0.071	0.080
	(0.033)	(0.032)	(0.037)	(0.034)
GROWTH	0.161	0.170	0.179*	0.188*
	(24.543)	(24.553)	(22.745)	(26.346)
LEV	-0.129**	-0.123*	-0.123	-0.115
	(-55.387)	(-55.388)	(-55.389)	(-55.390)
AGE	-0.001	-0.112*	-0.001	-0.001
	(-3.871)	(-3.222)	(-3.523)	(-2.874)
TOP1	0.023*	0.262	0.001	0.012
	(23.733)	(26.383)	(27.434)	(26.225)
Constant	0.146	1.176**	0.264*	0.264**
	(0.146)	(0.214)	(0.049)	(0.049)
Observations	280	280	280	280
R-squared	0.032	0.235	0.123	0.003
Standard errors in parentheses				

*** p<0.01, ** p<0.05,*p<0.1

Table 12

From the findings in Table 12, it can be deduced that for small-sized enterprises, only the governance pillar and its own financial performance exhibit a significant positive correlation at a 10% significance level. In contrast, the overall ESG performance, as well as the environmental and social dimensions, do not display a statistically significant relationship with ROA. The reason for this could potentially be attributed to the limited influence of small-sized enterprises, coupled with intense competition within their industries. As a result, these smaller enterprises might face challenges in utilizing ESG investments for brand promotion due to their relatively weaker brand awareness capabilities. The anticipated benefits of enhancing brand influence through reputation mechanisms might not be as evident, particularly considering the higher short-term costs associated with such investments. Consequently, the enthusiasm for ESG initiatives among small-sized enterprises might not be as pronounced. Furthermore, small-sized enterprises often encounter constraints in terms of available discretionary funds, a limited range of business activities, and less robust regulatory frameworks. This combination of factors might result in management not fully recognizing the potential and long-term benefits of ESG investments, thereby potentially leading to insufficient attention and minimal allocation of resources to ESG initiatives.

In conclusion, our analysis of companies of different sizes reveals discrepancies in the impact of ESG on CFP. Among large enterprises, both the overall ESG performance and individual dimensions exhibit a significant positive correlation with CFP. However, for small-sized enterprises, only the governance dimension demonstrates a significant positive relationship with CFP, while the associations between overall ESG performance and the environmental and social dimensions with CFP are not statistically significant.

4.5 Endogeneity test

In order to mitigate the impact of endogeneity, this study employs the industry-specific average ESG scores (ESG AVE) of publicly listed companies as instrumental variables. This choice is based on the rationale that a firm's ESG rating at a specific time is correlated with the ESG ratings of its peers within the same industry, while the ESG ratings of other industry peers would not directly influence the current-period performance of the focal firm. To assess the validity of the instrumental variable, a weak instrument test is conducted, followed by a two-stage least squares (2SLS) regression to address endogeneity concerns.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	ESG	ROA	ES	ROA	SS	ROA	GS	ROA
	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2	Stage 1	Stage 2
ESG AVE	-0.007*		-0.009**		-0.006*		-0.008**	
	(-2.97)		(-3.48)		(-2.65)		(-3.14)	
ESG		-0.041*						
		(-4.241)						
ES				-0.051				
				(-6.318)				
SS						0.440*		
						(-4.945)		
GS								0.725*
								(7.235)**
SIZE	-0.416***	-1.124***	-0.473***	-1.604***	0.409***	2.485***	-0.466***	1.980***
	(-11.62)	(-7.922)	(-12.84)	(-12.753)	(-11.34)	(9.394)	(-12.57)	(8.109)
GROWTH	0.042***	-0.537***	0.093***	2.132***	0.042***	-0.838***	0.096***	4.009***
	(3.50)	(-11.394)	(4.87)	(33.535)	(3.51)	(-9.577)	(4.98)	(32.586)
LEV	-0.102	0.361	-0.068	0.077	-0.081	0.989	-0.047	0.581
	(-1.13)	(1.013)	(-0.75)	(0.256)	(-0.89)	(1.498)	(-0.52)	(1.000)
AGE	0.003***	0.016***	0.002***	0.018***	0.003***	0.034***	0.002***	0.040***
	(6.32)	(9.285)	(4.20)	(12.491)	(6.53)	(10.943)	(4.37)	(13.988)
TOP1	0.212***	12.685***	0.191***	11.129***	0.230***	23.279***	0.209***	20.772***
	(6.86)	(103.854)	(6.13)	(107.244)	(7.47)	(102.999)	(6.72)	(103.745)
N	488	488	488	488	488	488	488	488
R-squared		0.164		0.408		0.150		0.346

Table 13

The first-stage instrumental variable test results indicate that the selection of industry-specific average ESG scores from different publicly listed companies is both reasonable and effective. In the second stage, the regression coefficient between ESG and CFP is reported as 0.041, showing statistical significance at the 10% level. The coefficients for SS and GS are also statistically significant at the 10% level, demonstrating a consistent positive correlation. This reaffirms the robustness of the conclusion that both ESG and social and governance dimensions contribute to the enhancement of firm performance.

5. Conclusion

5.1 Reflection and summary

In conclusion, this study delves into the relationship between ESG factors and CFP using data from EU-listed companies and Thomson Reuters' ESG scores. Specifically, it examines the impact of both overall ESG ratings and individual E, S, and G components on corporate performance. The main findings of this research are as follows:

Firstly, the positive correlation between ESG ratings and corporate performance suggests that the market responds favorably to higher ESG scores. The disclosure of ESG ratings contributes significantly to enhancing corporate performance.

Secondly, while the environmental component does not display a statistically significant association with corporate performance, the social component exhibits a positive and significant relationship.

Thirdly, the governance component is also found to be positively and significantly correlated with corporate performance.

These findings remain robust after undergoing rigorous tests for both robustness and endogeneity. Moreover, the analysis of heterogeneity based on company size reveals that the positive influence of ESG ratings on corporate performance is more pronounced among larger enterprises.

Based on those findings, it states the fact that ESG has a positive impact on CFP. This study looked through the correlation among ESG and CFP, the result can contribute to future study on ESG-CFP nexus. It provides methods to evaluate firm's financial performance and insights for policymakers, investors, and companies aiming to enhance their financial performance through sustainable practices. The revelation of the positive significance of ESG on CFP also

helped the investors form their investment strategy. This study conducted in the European market due to the fact that Europe is one of the leading roles of ESG reporting, the results can apply not only within Europe but also apply to other regions in the world. As the global focus on ESG considerations continues to grow, the conclusions drawn from this research contribute to a deeper understanding of how different ESG components can impact corporate outcomes in diverse contexts. This study fills the gap of current research on ESG components and continuously reminds people the significance of ESG as a whole and each criteria.

5.2 Practical Implications

The findings of this study hold several practical implications for various stakeholders within the business landscape. Firstly, for corporations themselves, the positive relationship between ESG ratings and corporate performance underscores the potential benefits of incorporating sustainable practices into their operations. As market participants react positively to higher ESG scores, companies that prioritize ESG considerations stand to gain enhanced financial performance, improved reputation, and better access to capital.

Secondly, investors can utilize the insights gained from this study to inform their investment decisions. By considering a company's ESG performance, investors can assess its potential for sustainable growth and long-term value creation. This may encourage investors to allocate resources towards businesses with robust ESG practices, contributing to the allocation of capital towards more sustainable and responsible endeavors.

Thirdly, policymakers and regulators can leverage the study's findings to shape policies that promote ESG integration and disclosure. Recognizing the positive relationship between certain ESG dimensions and corporate performance, regulatory frameworks can encourage companies to adopt transparent and effective ESG reporting practices. This, in turn, can foster a more sustainable and responsible business environment.

Furthermore, industry associations and advocacy groups can use these insights to promote awareness and education on ESG factors among their members. By highlighting the potential benefits of ESG integration, these organizations can drive positive change across sectors and encourage the adoption of sustainable practices.

Lastly, companies operating in different sectors can tailor their ESG strategies based on the specific findings related to E, S, and G dimensions. For instance, businesses that place a strong emphasis on social responsibility may see improved financial performance by investing in social initiatives that resonate with their stakeholders.

In essence, the practical implications drawn from this study emphasize the multifaceted advantages of incorporating ESG considerations into business strategies. As organizations

continue to navigate an evolving economic and environmental landscape, these findings provide valuable guidance on how sustainable practices can translate into improved financial outcomes and a more responsible corporate footprint.

5.3 Further Research

While this study sheds light on the relationship between ESG factors and CFP, there are several avenues for future research that could further enhance our understanding of this dynamic interplay.

Geographical and Cultural Contexts: Investigating how the ESG-CFP relationship varies across different geographical regions and cultural contexts can uncover nuances that are often overlooked. This study is conducted in the European market because Europe is in a special position in ESG reporting. Europe has a specific history and cultural background that push the development of ESG reporting. When it comes to other continents, due to the differences in regulatory environments, societal values, and stakeholder expectations, the result can be different. Therefore, a continuous study on different regions and cultures need to proceed.

Causality and Reverse Causation: Further research could delve into the causal relationship between ESG factors and CFP. In this study, the result shows a positive impact of ESG on CFP but there are also some studies that draw the opposite conclusion. Understanding the relationship between ESG and CFP can shed light on how companies can strategically align their efforts.

Effectiveness of ESG Metrics: Evaluating the effectiveness of various ESG metrics and ratings methodologies in predicting CFP. As one of the limitations listed above, to achieve the effectiveness of ESG rating still needs long term effort. An effective ESG rating could help companies, investors, and regulators in selecting and standardizing meaningful ESG indicators. Therefore, a systematic ESG rating is required.

Global ESG Trends: Exploring how global ESG trends and initiatives, such as the UN Sustainable Development Goals, impact corporate performance across diverse markets and industries. The result of Europe can be used as an example to apply to other markets in the world.

Incorporating these directions into future research can contribute to a more comprehensive and nuanced understanding of the complex relationship between ESG factors and CFP. This knowledge can further inform business strategies, policy decisions, and investment practices in the pursuit of a sustainable and responsible business landscape.

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