Does it pay to deliver superior ESG performance? Evidence from US S&P 500 companies

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Abstract

Purpose – The purpose of this paper is to investigate the relationship between a company's environmental, social and governance (ESG) performance and its financial performance. This paper also investigates the relationship between ESG performance and a company's market valuation. This paper provides convincing empirical evidence that delivering superior ESG performance pays off financially.

Design/methodology/approach – The financial data and ESG scores of 150 publicly traded companies listed in the Standard and Poor's 500 index for 2017–2020, comprising 5,750 observations, were collected. STATA was used to run a fixed-effect regression and a weighted least squares model to analyze the panel data.

Findings – The results of the empirical analysis suggest that companies with superior ESG performance perform better financially and are valued higher in the market compared to their industry peers. The ESG rating score impacts both return-on-capital-employed as a proxy for financial performance and Tobin's Q as a proxy for the market valuation of a company.

Originality/value – This study contributes to the existing research on ESG performance and financial performance relationship by providing empirical evidence to resolve confusion in the existing literature caused by contradictory evidence. Taking advantage of worldwide crisis caused by the COVID-19 pandemic, this study shows that a positive relationship between ESG performance and a company's market valuation holds even during times of unexpected crises. Further, this study contributes to business practitioners' knowledge by showing that ESG aspects constitute highly relevant non-financial information that impact the market's perception of a company and that investing in sustainability positively impacts a company's bottom line.

Keywords ESG rating, Financial performance, Sustainability, Panel data, WLS, Firm value, US S&P 500

Paper type Research paper

1. Introduction

The current environmental, social and governance (ESG) debate is complex. Some argue that ESG ratings are an attempt at obfuscation that hampers our society's ability to have a real impact on sustainability, while others building on "what gets measured gets done" premise argue that ESG rating improves ESG performance (Pucker, 2021). Despite this, businesses are continually pressured by stakeholders and society at large to address sustainability challenges and improve their ESG performance (Dakhli, 2021).

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Stakeholders' expectations towards businesses are increasing, causing them to look beyond their financial returns (Abrams *et al.*, 2021). Stakeholders can take many forms, from customers and investors to national and international authorities. This push on the part of stakeholders became more evident after the financial crisis of 2008/2009 hit the USA (Alareeni and Hamdan, 2020). The financial crisis, which had a severe impact on the global economy, was unleashed as a result of poor corporate governance and a focus on short-term financial returns (Velte, 2017). This eroded stakeholders' and public interest entities' trust in the ethics of business activities and led them to seek increased disclosure of ESG performance from businesses (Velte, 2017).

The demand for increased disclosure of ESG performance has led national and international authorities worldwide to initiate various reforms addressing ESG performance in the business community (Abrams *et al.*, 2021). Meanwhile, international standard-setting agencies have proposed reforms and frameworks to strengthen, facilitate and measure the ESG performance of businesses (Velte, 2019). To facilitate the contemporary sustainable shift on the part of businesses, investors are presently increasingly channeling their funds toward sustainable investments (Zumente and Lāce, 2021). This contemporary shift is currently rather significant. According to Zumente and Lāce (2021), sustainable investments in businesses have more than doubled in one year (2019–2020), showing substantial support for sustainable shifts on the part of investors.

Businesses have already begun to incorporate sustainability-related initiatives into their business activities (Nirino *et al.*, 2021). More and more businesses globally are complying with various International Organization for Standardization (ISO) standards, such as ISO 14001, which is concerned with sustainability and the environment; ISO 9001, which addresses quality management; ISO 27001, which focuses on information security; and ISO 45001, which is concerned with creating a safe working environment [International Organization for Standardization (ISO), 2018]. Businesses have also established corporate social responsibility (CSR) departments and engage in CSR activities to contribute to the environment and society (O'Brien *et al.*, 2020). Even more radically, businesses engage in efforts to reinvent themselves and develop sustainable business models (Geissdoerfer *et al.*, 2018).

According to Pucker (2021), commitment to CSR and ESG performance measurements by companies is expected to:

- improve sustainability performance based on the premise that "what gets measured gets done";
- generate higher equity performance compared to their industry peers based on ESG scores; and
- have investors and customers reward sustainability performers.

Metrics for measuring the sustainability performance of a business have evolved and are increasingly being used to complement financial metrics (Zumente and Lāce, 2021). Such metrics are reported publicly through CSR or sustainability reports enabling businesses to present their sustainability progress to stakeholders. Additionally, they showcase their sustainability-related initiatives and achievements through offline and online communication channels. Such visibility also enables them to be rated by CSR and ESG rating agencies (Shanaev and Ghimire, 2021).

Addressing sustainability is complex, time-consuming and costly, and financial returns are not always evident (Bocken and Geradts, 2020). Radical forms of tackling sustainability issues, such as through business model innovation for sustainability, are risky and complex,

making business practitioners hesitant to engage in them (Geissdoerfer *et al.*, 2018). The complexity of sustainability efforts may involve financial trade-offs and hinder a company's short-term financial goals (Bocken and Geradts, 2020). The picture becomes even more complex, as the financial benefits of addressing sustainability are questioned, and business practitioners raise the vital question of whether delivering superior ESG performance pays off financially (Bansal *et al.*, 2021).

Sustainability efforts may involve financial trade-offs, which lead to a debate about the responsibilities of a firm (Bocken and Geradts, 2020). Regarding the responsibilities of a firm, Friedman (1970) argued that a firm's social responsibility is profit maximization, suggesting that a firm's only responsibility is maximizing shareholder profits. Nevertheless, considering that the business community is blamed for being the most significant contributor to sustainability challenges, it has become evident that its responsibilities go beyond mere profit (Nirino *et al.*, 2021). Consequently, in 1994, Elkington coined the term "triple-bottom-line" (Elkington, 2018). The triple-bottom-line is a framework that measures a firm's successful performance in three dimensions: profits, planet and people (Elkington, 2018). Additionally, governments', business partners', social and environmental activists', investors' and customers' expectations of firms are that they behave socially and economically responsibly and that this behavior is gradually increasing (Porter and Kramer, 2011).

1.1 The economic viability of non-financial metrics

As firms shift their focus from profit maximization to non-financial metrics, the economic viability of such a shift is debated (Auer and Schuhmacher, 2016). Multiple studies have focused on this debate, anchoring it in multiple perspectives, such as:

- the impact of CSR performance on the financial and stock market performance of a company (Abrams *et al.*, 2021);
- the financial impacts of the overall ESG performance of companies (Bansal *et al.*, 2021);
- the financial impacts of superior performance on each of the three ESG components separately (Velte, 2017, 2019); and
- analyzing ESG performance and its financial impact in the presence of mediating and moderating factors (Agyemang and Ansong, 2017).

The economic viability of ESG investments is conceptualized across multiple theories, including trade-off theory, stakeholder theory, value creation theory and resource-based view (RBV) theory. In line with Friedman (1970), trade-off theory claims that a firm needs to use its resources and capabilities to serve its shareholders in the best way possible and maximize their profits (Gillan *et al.*, 2021). Consequently, it argues that ESG-related investments incur additional costs that may hinder shareholders' profits. Behl *et al.* (2021) found that ESG investments impact negatively firm value in the short term, supporting the trade-off theory while finding a positive correlation in long run. On the contrary, the stakeholder theory argues that a firm's responsibilities go beyond shareholders' interests, including multiple stakeholders and the society at large (Buchanan *et al.*, 2018). Accordingly, ESG investments benefit the environment, society and the firm itself, resulting in better financial performance and superior market valuation compared to its peers (Gillan *et al.*, 2021). Value creation theory suggests that ESG investments improve a firm's competitive advantage through the development of sustainable products and services and improved reputation among its stakeholders (Gillan *et al.*, 2021). In line with that, the RBV theory

advocates that ESG investments increase a firm's resources and capabilities to increase operational efficiency and the ability to mitigate ESG-related risks, hence resulting in improved financial performance and market valuation (Behl *et al.*, 2021).

1.2 The current confusion

The financial implications of superior CSR and ESG performance have been investigated in multiple geographical areas, including the USA, Europe, Asia and Africa (Aboud and Diab, 2019). Although numerous studies have investigated the ESG performance–financial performance link across multiple geographical areas and stock exchanges, the overall results remain inconsistent, leading to contradictory evidence (Bansal *et al.*, 2021). Such confusion in the empirical evidence may contribute to hesitation by business practitioners to shake off their existing business models and address sustainability.

Despite realizing the importance of addressing sustainability, businesses still tend to halt substantial changes in their business practices because the financial implications of sustainability are unclear (Bocken and Geradts, 2020). Existing research has produced contradictory evidence, leading to confusion in the existing literature. As a consequence, we find it necessary to use confusion spotting, identifying confusion in the existing literature, as a mode of gap-spotting, as suggested by Alvesson and Sandberg (2011). Through gap-spotting, it is possible to derive research questions that can reduce existing confusion (Alvesson and Sandberg, 2011). This study seeks to contribute to resolving this confusion by providing new empirical evidence.

Delivering superior ESG performance helps companies bond with stakeholders and build stakeholders' trust, which may serve as a protective shield during unexpected crises (Hwang *et al.*, 2021). Consequently, companies with superior ESG performance are rewarded by investors and tend to have easier journeys during crises compared to their peers. However, the relationship between ESG performance and a company's financial and market performance during unexpected crises has not been investigated. To the best of our knowledge, only one study focuses on this link during an unexpected crisis: Hwang *et al.* (2021), who provide evidence from Korea. Therefore, following the recommendation of Alvesson and Sandberg (2011) in constructing research questions from existing literature, we consider this an under-researched area and provide new empirical evidence on the ESG and financial and market performance links during 2017–2020, a period that includes the COVID-19 pandemic of 2019–2022. COVID-19 caused a severe economic crisis that manifested in major drops in the stock markets (Thorbecke, 2020). Aiming to resolve the confusion in the existing literature, this study addresses two gaps, one relating to the financial performance and one relating to the market valuation of a firm. Consequently, we pose the following two research questions (RQs):

RQ1. Does delivering superior environmental, social and governance performance enhance a firm's financial performance compared to industry peers?

RQ2. Does delivering superior environmental, social and governance performance enhance a firm's market value compared to industry peers?

1.3 Purpose and significance of the study

This study aims to provide convincing empirical evidence regarding the highly contradictory debate over the financial implications of ESG performance. In this case, "convincing" refers to the use of panel data regression analysis to test the hypothesis. This study aims to provide new evidence for an existing debate and to help sort out the confusion

caused by competing explanations of the topic. Further, it investigates the relationship between ESG rating and financial performance and that of ESG rating and market valuation over a period that includes a major worldwide crisis caused by COVID-19. Such an investigation helps researchers and businesses understand whether delivering superior ESG performance still makes a difference in terms of a company's financial performance and market valuation during an unexpected crisis. This is achieved by analyzing recent data from 150 firms in 50 industry sectors listed on the Standard and Poor's 500 (S&P 500) index for 2017–2020. The period includes an outbreak of COVID-19 that hit the world in late 2019 and reached its peak in 2020. The results of our research show that high-performing companies perform better financially, even during a worldwide crisis, and are valued higher in the stock market than their industry peers.

These results contribute to the existing literature and help business practitioners and policymakers. First, it builds on existing research in an attempt to overcome the confusion and inconsistency of the current debate. Existing literature presents competing explanations of the ESG rating–financial performance and ESG rating–market valuation dispute, as some researchers argue that superior ESG performance positively impacts the financial and market performance of a company. Some argue that financial performance and ESG performance trade-offs exist, while others do not find a significant correlation in this relationship. The ESG rating is a relatively young metric that businesses have begun to report over the past decade, and the changes in ESG ratings for companies have become more evident since 2017 (Shanaev and Ghimire, 2021). Thus, new evidence based on this rating would contribute to resolving the confusion caused by the contradictory available evidence in the existing research. According to Morgan Stanley Capital International (MSCI), a leading provider of ESG ratings, the availability of ESG ratings increased since 2017. Because of this increased availability since 2017, we chose 2017 to be the starting point for our study.

To the best of our knowledge, this is one of the first studies to investigate ESG ratings since 2017. Some may argue that this will not add value to the current debate. However, we align with Brooks and Oikonomou (2018), who argue that our current understanding may change over time. Our study tests this argument by analyzing ESG ratings over four years. Additionally, this study contributes to the existing debate by investigating the ESG–financial performance–market valuation relationship over time accompanied by an unexpected worldwide crisis. The results show that delivering superior ESG performance is rewarded by investors, even during turbulent economic times. As such, it brings forward empirical evidence to support stakeholder theory, which argues that engaging in good ESG practices helps companies build bonds and trust with stakeholders. The cultivation of such bonds and trust is rewarded by investors in the stock market, and our study shows that this continued during the COVID-19 pandemic.

Second, empirical findings help business practitioners overcome their reluctance to make innovative changes to their business models and aim for opportunities that may come with sustainability. Evidence from 150 S&P 500 companies can help businesses overcome the fear that sustainability-related initiatives may hinder financial performance. Investing in sustainability benefits a company's financial bottom line and is rewarded by investors in the stock market. Superior ESG performance contributes to company–stakeholder bonds and trust, which help companies have a smoother stock market journey during a worldwide crisis compared to their industry peers. Consequently, ESG aspects are highly relevant non-financial information that impact the market's perception of a company. Third, this study provides evidence to legislative policymakers by allowing them to evaluate their sustainability-related initiatives. Investors' behavior, as shown in this study, indicates that

ESG regulations have been incorporated into investment decisions. With behavior, we refer to investors' practice of rewarding companies that deliver superior ESG performance.

2. Theoretical background and hypothesis development

The impact of ESG ratings on firms' financial and market performance has received increased attention from scholars (Velte, 2019). It has produced a lively and highly controversial debate on the economics of superior ESG performance (Brooks and Oikonomou, 2018). Friede *et al.* (2015) argued that the relationship between ESG performance and corporate financial performance dates back to the 1970s, and since then, more than 2,000 empirical studies have been published. Bansal *et al.* (2021) identified three streams of research in this debate. Each stream argues that the correlation between ESG and financial performance is different – positive, negative or non-significant. Scholars in the *first research stream* (positive correlation) argue that acting in a socially and environmentally responsible manner is not significantly costly and that firms can benefit financially from their social and environmental responsibilities (McGuire *et al.*, 1988). According to these studies, superior EGS performance positively affects stakeholders' views of the company, increasing market value (Bansal *et al.*, 2021). Departing from value-creation theory, they claimed that superior ESG performance can lead to a competitive advantage (Bansal *et al.*, 2021). In the *second stream* (negative correlation), the research finds that acting responsibly in the social and environmental spheres is costly, and there is a trade-off between social performance and financial performance (McGuire *et al.*, 1988). The *third stream* of research suggests a non-significant correlation between ESG ratings and financial performance (Bansal *et al.*, 2021). An overview of the studies investigating this relationship is presented in Table 1. Our standpoint is that delivering superior ESG performance positively impacts a firm's financial performance and market valuation.

The debate on the financial impacts of sustainability performance has been studied within multiple categories (Alareeni and Hamdan, 2020): environmentally focused, CSR focused, corporate governance focused and ESG focused. In the *first category* (environment focus), the debate revolves around environmental regulations, the disclosure of environmental performance and their financial implications. The *second category* focuses on CSR, CSR disclosure and financial performance (Landi and Sciarelli, 2019). The *third category* explicitly focuses on corporate governance and financial performance. This category developed extensively after the 2008/2009 financial crisis because poor corporate governance was highlighted as one of the primary triggers of the crisis (Alareeni and Hamdan, 2020). The *fourth category* focuses on overall ESG performance and its financial implications (Alareeni and Hamdan, 2020). As the measurement of ESG performance became standardized and multiple ESG rating agencies developed rating tools, it became possible for researchers to assess the financial implications of overall ESG performance (Shanaev and Ghimire, 2021). Research across these four categories has produced contradictory results (Alareeni and Hamdan, 2020). These contradictions inspired us to investigate the impact of ESG ratings on a firm's financial performance based on recent data from the S&P 500.

The relationship between ESG rating and financial performance and between ESG and market valuation has been widely discussed in previous research. ESG rating measures focus on the long-term risks of a company's operational activities in those three aspects (Gyönyörová *et al.*, 2021). Complementary to financial reports, companies are increasingly publishing ESG reports, often referred to as sustainability reports or corporate responsibility reports, aiming to disclose their compliance with ESG issues (Murphy and McGrath, 2013). Motivations for disclosing ESG performance are twofold: first, improve ESG performance under the "what gets measured gets done" logic (Pucker, 2021) and, second, use it as a means to win stakeholders'

Table 1. Overview of studies investigating the environment, social and governance–financial performance relationship

Author and year	Sample size – no. of firms	Geographical context	Time period studied	Performance test	Conclusion	Comment
Fauzi *et al.* (2007)	383	Indonesia	2002–2003	Social–financial	Non-significant	Confirms the research gap
López *et al.* (2007)	110	Europe	1998–2004	CSR–financial	Negative link	Confirms the research gap
Brammer and Millington (2008)	537	UK	1990–1999	Social–financial	Non-significant	Confirms the research gap
Gillan *et al.* (2010)	2,247	Multiple countries	1992–2007	ESG–financial–market	Positive link	Supports our hypothesis
Humphrey *et al.* (2012)	256	UK	2002–2010	Corporate social responsibility (CSR)–financial	Non-significant	Confirms the research gap
Servaes and Tamayo (2013)	400–2,000	USA	1991–2000	ESG/CSR–market	Positive link – contingent on advertising, otherwise negative link	Confirms the research gap
Siew *et al.* (2013)	17	Australia	2008–2010	ESG–financial	Non-significant	Confirms the research gap
Borghesi *et al.* (2014)	780	USA	1992–2006	ESG–financial–market	Positive link	Supports our hypothesis
Di Giuli and Kostovetsky (2014)	3,000	USA	2003–2009	ESG/CSR–financial–market	No significant and negative link	Confirms the research gap
Dhaliwal *et al.* (2014)	1,093	Multiple countries	1995–2007	CSR and cost of capital	Negative link	Supports our hypothesis
Gao and Zhang (2015)	2,022	USA	1993–2010	ESG/CSR–market	Positive link	Supports our hypothesis
Lin *et al.* (2015)	500	USA	1998–2008	CSR–financial	Mixed results	Confirms the research gap
Masulis and Reza (2015)	406	USA	1996–2006	ESG (philanthropic activity)–market	Negative link	Confirms research gap
Plumlee *et al.* (2015)	79	USA	2000–2005	Environmental–market	Positive link	Supports our hypothesis
Bajic and Yurtoglu (2016)	1,700	Multiple countries	2003–2016	CSR–financial	Positive link	Supports our hypothesis
Chelawat and Trivedi (2016)	93	India	2008–2013	ESG–financial	Positive link	Supports our hypothesis
Rose (2016)	155	Denmark	2010/2011		Positive link	Supports our hypothesis

(*continued*)

Table 1.

Author and year	Sample size – no. of firms	Geographical context	Time period studied	Performance test	Conclusion	Comment
Agyemang and Ansong (2017)	423	Ghana	2013	Corporate governance–financial CSR–financial	Positive link	Supports our hypothesis
Garcia *et al.* (2017)	365	Brazil, Russia, India, China and South Africa (BRICS)	2010–2012	ESG–financial	Positive link	Supports our hypothesis
Limkriangkrai *et al.* (2017)	444	Australia	2009–2014	ESG and stock returns	Non-significant	Confirms the research gap
Velte (2017)	110	Germany	2010–2014	ESG–financial–market	Mixed results	Confirms the research gap
Atan *et al.* (2018)	54	Malaysia	2010–2013	ESG–financial–market	Non-significant	Confirms the research gap
Buchanan *et al.* (2018)	3,000	USA	2006–2010	CSR–market	Negative link	Confirms the research gap
Fatemi *et al.* (2018)	403	USA	2006–2011	ESG–market	Positive link	Supports our hypothesis
Li *et al.* (2018)	350	UK	2004–2013	ESG–market	Positive link	Supports our hypothesis
Yoon *et al.* (2018)	705	South Korea	2010–2015	ESG–market	Positive link	Supports our hypothesis
Zhao *et al.* (2018)	20	China	2007–2016	ESG–financial	Positive link	Supports our hypothesis
Aboud and Diab (2019)	100	Egypt	2012–2016	ESG–financial–market	Positive link	Supports our hypothesis
Chang *et al.* (2019)	2,441	USA	1991–2011	ESG/CSR–market	Positive link	Supports our hypothesis
Dalal and Thaker (2019)	65	India	2015–2017	ESG–financial–market	Positive significant link	Supports our hypothesis
Ikram *et al.* (2019)	240	Pakistan	2017	CSR–financial	Positive link	Supports our hypothesis
Landi and Sciarelli (2019)	40	Italy	2007–2015	ESG–market returns	Non-significant	Confirms the research gap
Alareeni and Hamdan (2020)	505	USA	2009–2018	ESG–financial–market	Positive link	Supports our hypothesis
Shahbaz *et al.* (2020)	414	Multiple countries	2011–2018	ESG–financial	No link	Confirms the research gap

(*continued*)

Author and year	Sample size — no. of firms	Geographical context	Time period studied	Performance test	Conclusion	Comment
Abrams *et al.* (2021)	345	USA	2014–2016	Environmental–management–market	Positive link	Supports our hypothesis
Behl *et al.* (2021)	62	India	2016–2019	ESG–market	Mixed results	Confirms the research gap
Bansal *et al.* (2021)	210	India	2010–2019	ESG–financial	Limited positive link	Confirms the research gap
Hwang *et al.* (2021)	137	South Korea	2018–2020	ESG–financial	Positive link	Supports our hypothesis
Wong *et al.* (2021)	62	Malaysia	2005–2018	ESG–market	Positive link	Supports our hypothesis
Brooks and Oikonomou (2018)						*Inspired this study because they argue that the ESG contradictions can change over time*
Velte (2019)						*Inspired this study because they argue that there are contradictions*

Note: Studies are presented in chronological order by publication year

Table 1.

acceptance and build trust with them (Murphy and McGrath, 2013). In turn, ESG rating agencies have set up rating frameworks to measure the ESG performance of companies. Rating of ESG performance is based on available public information, although rating agencies have advanced their assessment mechanisms (Escrig-Olmedo *et al.*, 2019; Li and Polychronopoulos, 2020).

Financial performance measures a company's financial well-being and standing in terms of revenue, expenses, profitability, assets, liabilities and equity (McGuire *et al.*, 1988). In operational terms, financial performance refers to the degree to which a company uses its assets to generate profits. Market valuation represents the market's perception of the value of a company, which is reflected in the stock prices of a company's outstanding shares (Alareeni and Hamdan, 2020).

In the following, we present our two hypotheses derived to address our RQs.

2.1 Environmental, social and governance rating and financial performance

Numerous studies have investigated the relationship between financial performance and ESG rating factors (Bansal *et al.*, 2021), and as mentioned earlier, the results of existing studies are contradictory (Velte, 2019). Brooks and Oikonomou (2018) argued that such a relationship may change over time. Concerned with additional costs incurred because of investments in ESG, few studies show that delivering a superior ESG performance is negatively correlated with a firm's financial performance (Gillan *et al.*, 2021). Di Giuli and Kostovetsky (2014) found a significant positive correlation between CSR and operating expenses, showing that ESG activities negatively impact a firm's financial performance. However, recent studies, as shown in Table 1, have found a significant, positive link between ESG performance and financial performance. Such a positive link is mainly supported by stakeholder theory, value creation theory and the theory of RBV. According to stakeholder and value creation theory, investments in ESG in form of developing quality sustainable products and engaging in social activities increase a firm's market reputation, resulting in an increase in demand for its products and in the ability to charge higher prices compared to its competitors, which then, positively impacts a firm's financial performance (Capelle-Blancard and Petit, 2019; Behl *et al.*, 2021). Such a product differentiation strategy helps firms with superior ESG performance have a less price-elastic demand in turbulent market times, resulting in superior financial performance compared to their industry peers (Gillan *et al.*, 2021). Investments in ESG practices increase the operational efficiency of a firm, improve market position and reduce cost-of-capital, resulting in improved financial performance (Shahbaz *et al.*, 2020). In consonance with the RBV, investments in ESG-related activities help build capacities to mitigate future regulatory litigations related to ESG requirements, therefore helping avoid potential burdens in future cash flow, and as such, positively impact a firm's financial performance (Behl *et al.*, 2021).

Grounded in the stakeholder theory, value creation theory and RBV, we propose the following hypothesis on ESG–firm financial performance relationship:

H1. Environmental, social and governance rating has a significant, positive impact on a firm's financial performance.

2.2 Environmental, social and governance rating and firm value

ESG rating and firm value relationship has been investigated across multiple industries and countries, producing contradictory results (Behl *et al.*, 2021). Grounded in the agency problem theory, some studies argue that company insiders tend to overinvest in ESG-related

activities for their own personal benefits, such as increased reputation at the expense of shareholders (Buchanan *et al.*, 2018). Such overinvestments, consequently, lead to a negative correlation between ESG and firm value (Gillan *et al.*, 2021). Masulis and Reza (2015) find that philanthropic activities as a type of ESG activity help the CEOs' interest but are not valued by investors resulting in a decreased firm value. The negative relationship is supported by the cost-concerned school, arguing that ESG-related activities incur additional operating expenses, negatively impacting a firm's market value (Mervelskemper and Streit, 2017). As shown in Table 1, few other studies show that the impact of ESG activities is ambiguous or non-significant on a firm's value. At the same time, Servaes and Tamayo (2013) argue that ESG investment and firm value relationship is positive contingent on the level of advertisement.

Supported by the RBV theory, value creation theory, cost-of-capital reduction theory and stakeholder theory, many studies show a positive relationship between ESG performance and a firm's market value (Mervelskemper and Streit, 2017). Following the RBV theory, investing in ESG helps firms to develop tangible and intangible resources, including the ability to mitigate potential ESG-related regulatory costs, increase product quality, increase a firm's reputation and increase operational efficiency, resulting in an increase in a firm's competitive advantage (Behl *et al.*, 2021). Similarly, the value creation theory claims that ESG performance positively impacts a firm's competitive advantage (Bansal *et al.*, 2021). Departing from cost-of-capital reduction theory, Gillan *et al.* (2021, p. 8) claim that ESG performance can "affect many types of risk, including systematic risk, regulatory risk, supply chain risk, product, and technology risk, litigation risk, reputational risk, and physical risk." An increase in a firm's ability to mitigate those risks helps firms receive a more favorable credit rating resulting in a lower cost of debt (Gillan *et al.*, 2021). As institutional and individual investors shift to focus on green investments, delivering a superior ESG performance yields a lower cost of equity (Behl *et al.*, 2021). Wong *et al.* (2021) find that ESG investments help decrease a firm's cost-of-capital and, consequently, positively impact a firm's market value.

Customers are vital stakeholders who increasingly demand and reward companies that deliver sustainable products and services (Kiron *et al.*, 2012). The stakeholder theory suggests that various stakeholder groups are affected by a firm; hence, a firm's responsibility extends beyond shareholder interests, including those of employees, customers, bondholders, regulators and other groups of interest (Freeman and McVea, 2001). Grounded in the stakeholder theory, many studies claim that delivering superior ESG performance is perceived positively by stakeholders, which helps build trust and translates into higher market valuation (Bansal *et al.*, 2021). Li *et al.* (2018) analyzed the data of 350 firms in the UK and found that superior ESG performance enhances firm value. They argued that high levels of ESG performance disclosure increase transparency, accountability and trust among stakeholders. This is further strengthened by Hwang *et al.* (2021), who identified that the trust and friendship built with stakeholders because of superior ESG performance helped companies maintain good financial and market performance during turbulent times, such as during the COVID-19 pandemic. Gutsche *et al.* (2017) argued that superior ESG performance fosters companies' sustainable strategies and long-term outlooks, resulting in better market performance compared to industry peers.

Based on the stated theories and arguments, we propose the following hypothesis on ESG–the firm market value relationship:

H2. Environmental, social and governance rating has a significant, positive impact on a firm's market value.

3. Methods

3.1 Data collection

The sample of this study consisted of 150 firms from the S&P 500 index studied from 2017 to 2020. The firms in this sample belonged to 50 industry sectors, offering a high degree of industry representation for the study. The S&P 500 is a stock market index consisting of the 500 largest US companies by market capitalization. The S&P 500 was selected for four reasons:

(1) It represents some of the largest firms in the world.

(2) The companies listed on the S&P 500 index tend to have a higher degree of ESG disclosure.

(3) The companies listed on the S&P 500 index are included and evaluated by significant ESG rating agencies; hence, more historical ESG rating data are available.

(4) Disagreements on ESG ratings tend to be greater for some of the largest S&P 500 companies making it hard for researchers to draw conclusions (Gibson *et al.*, 2021).

Hence, as ESG rating agencies mature and more ESG-related data is available, using recent data for S&P 500 may help increase the validity of research evidence for researchers.

This study focuses on data over four years, from 2017 to 2020. This period was chosen because of 1) the availability of ESG rating data for S&P 500 companies, 2) the increase in maturity and quality of ESG data sources and assessments and 3) the opportunity to test the hypotheses during a worldwide crisis. MSCI, on its online Web platform, provides historical ESG rating data for the past five years or since the first ESG rating was recorded for a company. The first ESG rating for most companies was recorded in 2017. Therefore, 2017 was the starting year for the data studied in this study. Not all selected companies have ESG ratings for 2017. Of the selected companies, 25 did not have ESG ratings for 2017. As the competition among ESG data suppliers increased, the quality of ESG-related products increased. This is evident since the year 2017 (Gyönyörová *et al.*, 2021). The COVID-19 challenge enables us to investigate whether positive ESG–financial–market company performance holds even during an unexpected crisis. As the pandemic continued in 2021 and 2022, the inclusion of these two years would help our investigation; yet, when writing this article, data for these two years was not available.

The data for this study were collected from multiple sources. First, the ESG ratings for the selected firms were collected from the MSCI. MSCI was founded in 1969 and has served as a leading provider of tools and services to the global investment community. It offers an ESG rating history for more than 2,800 companies globally. MSCI grades the ESG performance of companies based on publicly available data and shows how a company compares with its industry peers. It has a seven-scale grading system, in which CCC is the lowest grade and AAA is the highest grade. The MSCI ESG rating is a combined environmental–social–governance rating. Second, financial and accounting data for the selected firms were collected from the annual reports of the companies, which were retrieved from the firms' websites and the macro trends platform, a research platform that offers financial data for investors. Third, the stock prices of the selected companies were collected from the Yahoo Finance website. Across the three data sources, data were collected at the end of each fiscal year for 2017, 2018, 2019 and 2020. A summary of the data collected and their sources is presented in Table 2. Table 3 presents the total number of observations collected, which is 5,750.

Name	Description	Source(s)
ESG rating	ESG rating of the selected companies by year	MSCI ESG rating
Shareholder's equity	Net worth of the company	Annual reports and Macrotrends platform
Number of shares outstanding	Number of shares held by company's shareholders	Macrotrends platform
Price per share	Price valuation of each share outstanding	Yahoo finance
Net income	Company's net earnings after all expenses are deducted from revenues	Annual reports and Macrotrends platform
Earnings before interest and tax (EBIT)	Company's earnings before interest and taxes are deducted	
Current assets	Company's assets expected to be sold or consumed within one financial or fiscal year	
Non-current assets	Company's long-term assets not expected to be sold or consumed within one financial or fiscal year	
Current liabilities	Company's liabilities expected to be settled within one financial or fiscal year	
Non-current liabilities	Company's liabilities not expected to be settled within one financial or fiscal year	

Table 2. Summary of data collected and their sources

Name	2017*	2018	2019	2020	Total
ESG rating	125	150	150	150	*575*
Shareholder's equity	125	150	150	150	*575*
Number of shares outstanding	125	150	150	150	*575*
Price per share	125	150	150	150	*575*
Net income	125	150	150	150	*575*
Earnings before interest and tax (EBIT)	125	150	150	150	*575*
Current assets	125	150	150	150	*575*
Non-current assets	125	150	150	150	*575*
Current liabilities	125	150	150	150	*575*
Non-current liabilities	125	150	150	150	*575*
Total	*1,250*	*1,500*	*1,500*	*1,500*	*5,750*

Note: *For 2017, 25 of the selected companies did not have ESG ratings available through MSCI

Table 3. The number of collected observations per year

The data set used in this study was drawn using the probability sampling technique, which implies that every member of the population has an equal probability of being selected (Blackstone, 2012). Probability sampling helps to identify a representative sample and achieve generalizability (Blackstone, 2012). Consequently, this sample allowed us to generalize our findings.

3.2 Measures and variables

3.2.1 Measuring a firm's environmental, social and governance performance. Measuring a firm's ESG performance is challenging because it includes multiple dimensions that are difficult to quantify (Zumente and Lāce, 2021). Studies rely heavily on companies that provide ESG performance ratings and scores to overcome this challenge. Prominent providers of ESG ratings include Sustainalytics, Asset 4, Inmate, Bloomberg, MSCI and

MSCI Intangible Value Assessment (Gibson *et al.*, 2021). This study used MSCI ratings as a proxy for a company's ESG performance. MSCI is a leading provider of ESG ratings with 17 years of expertise in providing ESG ratings (Zumente and Lāce, 2021). MSCI rates the ESG performance of a firm with the letter grades CCC (worst), B, BB, BBB, A, AA and AAA (best). Firms with rating grades CCC and B are described as laggards within their industry. Those with grades BB, BBB and A are described as average performers, and those with AA and AAA ratings are labeled leaders within their industry. MSCI ratings are distributed by industry, considering industry-specific ESG issues, and are based on their relative ESG performance compared to their industry peers. To quantify these letter grades, an ordinal scale was used. Each of the ESG rates is given a number, as shown in Table 4.

3.2.2 Measuring a firm's financial performance. To measure a firm's financial performance, this study uses accounting-based measures, following Velte (2017) and Zhao *et al.* (2018). Accounting-based measures of financial performance include return-on-sales, return-on-assets, return-on-capital-employed (ROCE), operating income, sales and growth rate (McGuire *et al.*, 1988). ROCE is one of the most frequently used measures of financial performance; hence, it is used in this study. Zhao *et al.* (2018) argued that because ROCE is calculated using EBIT, the interference of tax rates among companies is eliminated, leading to a fair comparison of their financial performance levels.

3.2.3 Measuring a firm's market value. Commonly used measures of a firm's market value include Tobin's Q and the market-to-book value ratio. Following Fatemi *et al.* (2018) and Velte (2017), this study used Tobin's Q to measure a firm's market valuation. Tobin's Q is the "ratio of the market value of a firm to the replacement cost of its asset" (Lindenberg and Ross, 1981, p. 1).

3.2.4 Dependent variables. To test *H1* and measure the impact of the ESG rating on a firm's financial performance, this study will use ROCE as a dependent variable. Tobin's Q was used as the dependent variable for *H2*. The calculations of ROCE and Tobin's Q are presented in Table 5.

3.2.5 Independent variables. This study used the ESG rating as the independent variable for both hypotheses. Both models control for the debt-to-equity ratio (DOT) and company size (size). Also known as the leverage ratio, DOT reflects a firm's capital structure and default risk, and DOT levels above the optimal level are "negatively correlated with financial performance" (Zhao *et al.*, 2018, p. 10). Thus, it is controlled in this model. Company size also impacts financial performance (Abrams *et al.*, 2021). Dalal and Thaker (2019) argued that large firms are likely to exploit economies of scale and economies of scope and have higher operational efficiency levels, resulting in better financial performance. A company's size is reflected in its total assets and sales (Strahan and Weston, 1998). In this study, a company's size was based on its total assets. A summary of the variables is presented in Table 5.

Table 4.
Quantifying environment, social and governance rating letter grades and corresponding ordinal scale

MSCI ESG rating	CCC	B	BB	BBB	A	AA	AAA
Corresponding ordinal scale	1	2	3	4	5	6	7

Variable	Application	Type of variable	Calculation	Explanation
ESG rating	*H1* and *H2*	Independent variable	Quantified as explained in Table 4	Environment, social and governance (ESG)
ROCE	*H1*	Dependent variable	ROCE = EBIT/ (current assets − current liabilities)	Return-on-capital-employed (ROCE) Earnings before interest and tax (EBIT)
Tobin's Q	*H2*	Dependent variable	Tobin's Q = (equity market value + liabilities' market value)/(equity book value + liabilities' market value)	Equity market value is calculated by multiplying the number of shares outstanding at the end of the fiscal year by the share price at the end of the fiscal year; The book value of assets is used as a proxy for the replacement costs of assets
DOT	*H1* and *H2*	Controlled variable	DOT = total liabilities/ shareholder's equity	Debt-to-equity ratio (DOT)
Size	*H1* and *H2*	Controlled variable	Size = log (total assets)	Total assets as a proxy for company size

Table 5. Dependent, independent and controlled variables

3.3 Panel regression models

The hypotheses put forward in this study were tested using panel data regression. Panel data analysis is the "investigation of the development of variables over time [. . .] [and usually are] associated with a sample of respondents being interviewed at two or more time points" (Mehmetoglu and Jakobsen, 2016, p. 228). This study collects ESG and financial data at four time points. Panel data are appropriate and benefit this study for the following reasons:

- They help control for heterogeneity of individual firms in the sample and, therefore, avoid biased results.
- They help reduce collinearity between variables by providing more informative data.
- They are very efficient in identifying and measuring the impact of variables (Baltagi, 2005; Hsiao, 2014).

Panel data are widely used in similar studies (Bansal *et al.*, 2021; Dakhli, 2021; Velte, 2019). In this study, data were collected from 150 firms from 2017 to 2020; consequently, the number of observations was 600. The number of observations was calculated by multiplying the number of units, denoted by i, by the number of time points, denoted by t:

$$\text{Number of observations} = i \times t = 150 \times 4 = 600$$

The panel data used in this study are equal to the number of periods per firm; therefore, they can be termed balanced panels (Hsiao, 2014). This is evidenced in STATA, as shown in Table 6. For 2017, 25 selected companies did not have ESG ratings available in MSCI.

Panel variable:	id (strongly balanced)
Time variable:	year, 2017 to 2020
Delta:	1 delta

Notes: The data were strongly balanced

Table 6. Data were sorted using group (id) and time (year) as identification variables

3.3.1 Empirical models. This study aims to investigate whether ESG ratings have a significant positive effect on a firm's financial performance and market valuation. Therefore, the following panel regression models were tested:

$$\text{Firm Financial Performance}_{it} = \beta_0 + \beta_1 \text{ESGRating}_{it} + \beta 2\text{DOT}_{it} + \beta 3\text{Size}_{it} + \varepsilon_{it}$$

$$\text{Firm Market Valuation}_{it} = \beta_0 + \beta_1 \text{ESGRating}_{it} + \beta_2 \text{DOT}_{it} + \beta_3 \text{Size}_{it} + \varepsilon_{it}$$

Variables in the regression models are denoted by *it*, which implies the value of the *i*-nth firm in the *t*-nth year.

In panel data analysis, three types of methods exist via which to estimate the model:

(1) pooled ordinary least squares (OLS) regression;

(2) fixed-effects regression; and

(3) random-effects regression (Baltagi, 2008).

An OLS regression "assumes that errors are both independent of each other (absence of autocorrelation) and normally distributed" (Mehmetoglu and Jakobsen, 2016, p. 235). A fixed-effects regression is used to test the effect of variables that change over time and helps to "explore the relationship between the dependent and the explanatory variables within a unit" (Mehmetoglu and Jakobsen, 2016, p. 242). Brüderl and Ludwig (2015, p.327) argued that social researchers prefer fixed-effects regression because it allows a "causal effect to be identified under weaker assumptions". A random-effects regression is used if there is "no (or little) covariation between the error term and the explanatory variables, that is, if $\text{cov}(x_i, c_i) = 0$" (Mehmetoglu and Jakobsen, 2016, p. 250). An OLS regression is not favored for panel data analysis, mainly because it does not separate selection effects from real effects when investigating results (Mehmetoglu and Jakobsen, 2016). To select between fixed-effects regression and random-effects regression and ensure that the most efficient method is used, this study applies the Hausman (1978) test, following the guidelines of Mehmetoglu and Jakobsen (2016). The random-effects regression model is appropriate if $\text{cov}(\alpha_i, x_{it}) = 0$, while if $\text{cov}(\alpha_i, x_{it}) \neq 0$, then a fixed-effects regression model is favored (Zhao *et al.*, 2018). In the Hausman test, the null hypothesis is $\text{cov}(\alpha_i, x_{it}) = 0$.

The Hausman's test results displayed in Table 7 show that we can reject the null hypothesis for both of our models because the *p*-value is significant at the 5% level. Therefore, a fixed-effects regression will be used in this study.

4. Analysis

This section provides statistical tests and analyses to test the hypotheses put forward in this study. The data analysis in this study was performed using STATA, version 17.0.

4.1 Descriptive statistics and correlations

Before proceeding with the regression analysis and testing the stated hypotheses, the descriptive statistics for the variables are summarized. Table 8 includes the mean, median,

Table 7. Hausman test results

Dependent variable	Test summary	*p*-value
Return-on-capital-employed (ROCE)	Random effects test	0.0000
Tobin's Q	Random effects test	0.0321

standard deviation, minimum and maximum values for each variable. As shown in Table 8, the sample includes firms with the lowest possible ESG rating (CCC = 1) and the highest possible ESG rating (AAA = 7), with a mean of 4,0539.

Figure 1 displays the distribution of ESG ratings across the selected S&P 500 companies for each year. One histogram is used for each year, in which the *x*-axis shows ESG rating categories and the *y*-axis shows the number of companies for each respective ESG rating.

Figure 2 shows that, in general, companies have improved their ESG performance during these four years. It shows that fewer and fewer companies are graded with CCC and B ratings, while the number of companies with AAA ratings is more or less constant.

Variable	Observations	Mean	Median	SD	Minimum	Maximum
ESG rating	575	4.0539	4.0000	1.5115	1.0000	7.0000
Tobin's Q	575	2.8438	2.2978	2.0791	0.6038	16.1022
Debt-to-equity ratio (DOT)	575	1.1275	0.7545	1.6810	−9.0381	14.3800
Return-on-capital-employed (ROCE)	575	0.1329	0.1109	0.1458	−0.8072	1.6496
Company size (Size)	575	10.5638	10.5414	0.5956	8.9226	12.3541

Table 8. Descriptive statistics of the variables

Figure 1. Distribution of ESG ratings across companies by year. Histograms were created using STATA

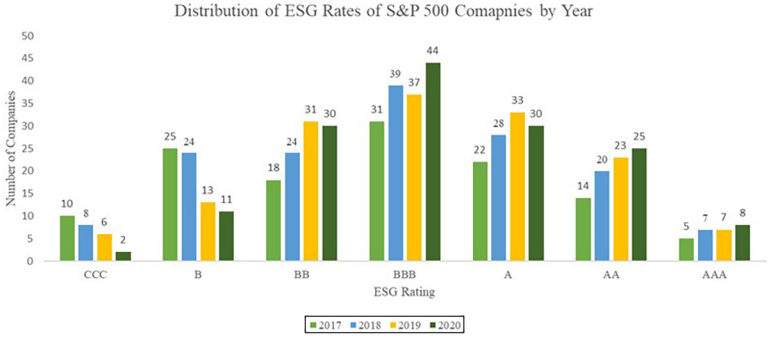

Figure 2. Distribution of ESG ratings of S&P 500 companies by year. Bar charts were created using MS Excel

Table 9 shows the correlation factors between the variables in this study. Correlations between the variables were as expected. The ESG rating is positively correlated with all the other variables and is consistent with findings from other similar studies, such as Zhao *et al.* (2018), Yoon *et al.* (2018) and Velte (2017).

Further data were tested for non-stationarity using Harris and Tzavalis (1999) unit-root test. The null hypothesis states that a unit root is present, and data is not stationary. As Table 10 shows, we can reject the null hypothesis because the *p*-value is significant at 5%. Thus, the data set is stationary, indicating that the shape of the distribution does not change over time (Hadri, 2000).

4.2 Panel data regression

To test the hypothesis put forward in this study, panel data regression was applied. As explained above, the Hausman test suggests that fixed-effects regression is appropriate for this study. The results of the fixed-effects panel regression for the dependent variable ROCE are displayed in Table 11, while the results for the dependent variable (Tobin's Q) are shown in Table 12. Tables 11 and 12 show the estimated coefficients, *t*-statistics and *p*-values.

4.3 Heteroscedasticity test

Regression models were also tested for heteroscedasticity. If such is present, then the "model predicts some values of the dependent [variable] more precisely than the others" (Mehmetoglu and Jakobsen, 2016, p. 234). To test for heteroscedasticity, this study used Breusch and Pagan's (1979) test. The null hypothesis states that there is homoscedasticity. The test results for both dependent variables, ROCE and Tobin's Q, are presented in Table 13 and show that with significant *p*-values, the null hypotheses are rejected. Therefore, heteroscedasticity is present.

The presence of heteroscedasticity is also recognized graphically when the residuals are plotted against fitted values, as shown in Figures 3 and 4 for ROCE and Tobin's Q, respectively.

To overcome the problem of heteroscedasticity, this study applies a weighted least squares (WLS) model, following Zhao *et al.* (2018) and Chelawat and Trivedi (2016).

Table 9. Correlation matrix

Variable	Return-on-capital-employed (ROCE)	Tobin's Q	ESG rating	Debt-to-equity ratio (DOT)	Company size (Size)
Return-on-capital-employed (ROCE)	1.0000				
Tobin's Q	0.5163	1.0000			
ESG rating	0.0660	0.0790	1.0000		
Debt-to-equity ratio (DOT)	0.1269	0.0457	0.1002	1.0000	
Company size (Size)	−0.2986	−0.4579	0.0363	−0.0646	1.0000

Table 10. Stationarity test results

Variable	Test summary	*p*-value
Return-on-capital-employed (ROCE)	Stationarity test	0.0000
Tobin's Q	Stationarity test	0.0011

This WLS model enables us to weight each "value of the independent variables inversely proportional to the error variance" and correct for heteroscedasticity (Zhao *et al.*, 2018, p. 12).

4.4 Weighted least squares regression

The WLS regression results for both dependent variables, ROCE and Tobin's Q, are presented in Tables 14 and 15, respectively. As shown in Table 14, the WLS regression model for the dependent variable ROCE has an R-squared value of 0.1689, meaning that the independent variables explain 16.89% of the variation in the independent variable. The F-statistic of the model was 38.67, showing that the model was statistically significant. The coefficient of each independent variable shows its impact in terms of predicting the dependent variable, holding other variables' impacts constant. The *p*-value of each independent variable shows the significance of its impact in terms of predicting the

	ROCE			
Variable	Coefficient	Standard error	*t*-ratio	*p*-value
ESG rating	−0.0124	0.00826	−1.50	0.1350
Debt-to-equity ratio (DOT)	−0.0102	0.00489	−2.09	0.0370
Company size (Size)	−0.2413	0.04591	−5.26	0.0000
Constant	2.7439	0.47609	5.76	0.0000
R^2	0.0913			
F	14.14			
Prob > F	0.0000			
sigma_u	0.1588			
sigma_e	0.0905			
rho	0.7551			

Table 11. Fixed-effects regression model for the dependent variable return-on-capital-employed

	Tobin's Q			
Variable	Coefficient	Standard error	*t*-ratio	*p*-value
ESG rating	0.1099	0.05917	1.86	0.0640
Debt-to-equity ratio (DOT)	0.0052	0.03500	0.15	0.8820
Company size (Size)	−0.5881	0.32874	−1.79	0.0740
Constant	8.6051	3.40894	2.52	0.0120
R^2	0.0121			
F	1.72			
Prob > F	0.1625			
sigma_u	1.8459			
sigma_e	0.6478			
rho	0.8903			

Table 12. Fixed-effects regression model for the dependent variable Tobin's Q

Dependent variable	Test summary	*p*-value
Return-on-capital-employed (ROCE)	Heteroscedasticity test	0.0000
Tobin's Q	Heteroscedasticity test	0.0000

Table 13. Heteroscedasticity test results

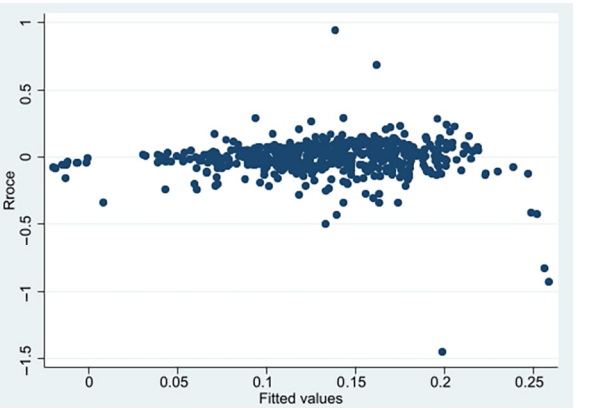

Figure 3.
Residuals plotted against fitted values for ROCE

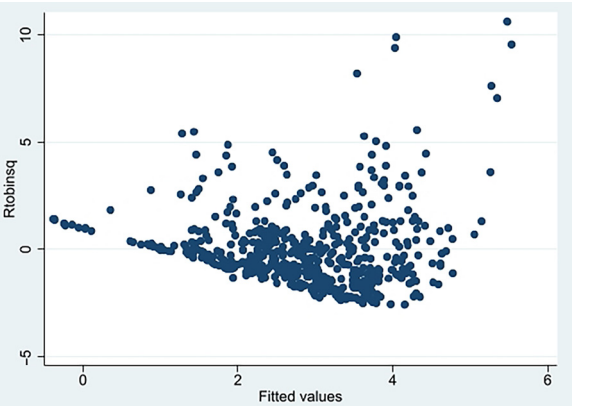

Figure 4.
Residuals plotted against fitted values for Tobin's Q

Table 14.
Weighted least squares regression model for the dependent variable return-on-capital-employed

	ROCE			
Variable	Coefficient	Standard error	*t*-ratio	*p*-value
ESG rating	0.0109	0.00334	3.26	0.0010
Debt-to-equity ratio (DOT)	−0.0078	0.00359	−2.17	0.0030
Company size (Size)	−0.0684	0.00752	−9.09	0.0000
Constant	0.8213	0.07928	10.36	0.0000
R^2	0.1689			
Adjusted R^2	0.1645			
F-statistic	38.67			
Prob > F	0.0000			

dependent variable. The coefficients show that the ESG rating contributes positively to the dependent variable, while DOT and size contribute negatively to the dependent variable. The *p*-values show that each independent variable is highly significant to the model at the 5% level. Therefore, the model can be defined as follows:

$$\mathrm{ROCE}_{it} = 0.8213 + 0.0109 \times \mathrm{ESGRating}_{it} + (-0.0078) \times \mathrm{DOT}_{it} + (-0.0684) \times \mathrm{Size}_{it} + \varepsilon_{it}$$

Table 15 shows that the WLS regression model for the dependent variable Tobin's Q has an R-squared value of 0.2456, meaning that the independent variables explain 24.56% of the variation in the independent variable. The F-statistic of the model was 61.97, showing that the model was statistically significant. The coefficient of each independent variable shows its impact in terms of predicting the dependent variable, holding other variables' impacts constant. The *p*-value of each independent variable shows the significance of its impact in terms of predicting the dependent variable. The coefficients show that the ESG rating contributes positively to the dependent variable, while DOT and size contribute negatively to the dependent variable. The *p*-values show that each independent variable is highly significant to the model at the 5% level. Therefore, the model can be defined as follows:

$$\text{Tobin's Q}_{it} = 20.7326 + 0.1469 \times \mathrm{ESGRating}_{it} + (-0.1404) \times \mathrm{DOT}_{it} + (-1.7351) \times \mathrm{Size}_{it} + \varepsilon_{it}$$

Finally, the residuals of the two WLS regressions are plotted to determine how well the identified heteroskedasticity problem has been solved. Figure 5 shows the residuals of the WLS regression model for ROCE. Comparing it to Figure 3, it is evident that the heteroskedasticity problem has been addressed. Similarly, Figure 6 shows the residuals of the WLS regression model for Tobin's Q. Again, comparing Figures 6 to 4, it can be stated that the heteroskedasticity problem is addressed here as well.

5. Discussion and conclusions

This study investigated the impact of ESG ratings on financial performance and market valuation for 150 companies listed on the S&P 500 index from 2017 to 2020. Specifically, it assessed the impact of ESG rating on financial performance, as measured using the accounting-based metric ROCE, and on market valuation, as measured using the accounting-based metric Tobin's Q. The results of the regression models confirm the stated hypotheses of this study, suggesting that the ESG rating has a significant positive impact on the financial performance and market valuation of a company.

Addressing *H1*, the first equation shows that holding all other predictors constant, an increase of one rating grade in terms of ESG performance increases the return on employed capital by 1.51%. This outcome is consistent with the findings of Gillan *et al.* (2010),

	Tobin's Q			
Variable	Coefficient	Standard error	*t*-ratio	*p*-value
ESG rating	0.1469	0.05337	2.75	0.0060
Debt-to-equity ratio (DOT)	−0.1404	0.04877	−2.88	0.0040
Company size (Size)	−1.7351	0.13650	−12.71	0.0000
Constant	20.7326	1.43607	14.44	0.0000
R^2	0.2456			
Adjusted R^2	0.2417			
F-statistic	61.97			
Prob > F	0.0000			

Table 15. Weighted least squares regression model for the dependent variable Tobin's Q

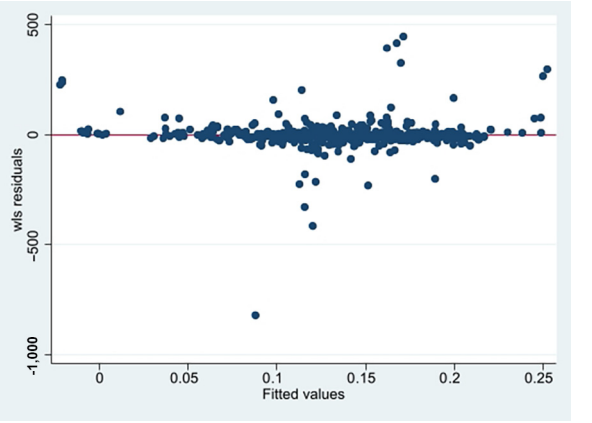

Figure 5.
Residuals plotted against fitted values for the WLS regression for ROCE

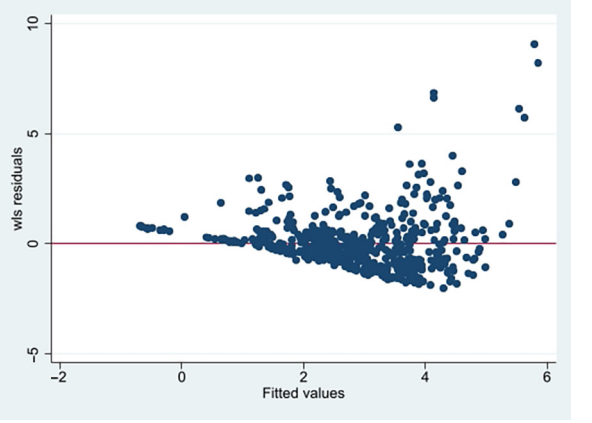

Figure 6.
Residuals plotted against fitted values for the WLS regression for Tobin's Q

Borghesi *et al.* (2014), Bajic and Yurtoglu (2016), Chelawat and Trivedi (2016), Agyemang and Ansong (2017), Garcia *et al.* (2017), Zhao *et al.* (2018), Aboud and Diab (2019), Dalal and Thaker (2019), Ikram *et al.* (2019), Alareeni and Hamdan (2020), Shahbaz *et al.* (2020), Bansal *et al.* (2021) and Hwang *et al.* (2021). This result supports the value-creation theory, which states that superior ESG performance leads to a competitive advantage for the company by showing that improvements in ESG practices enhance the financial performance of the company. The result indicates that the ESG–financial performance relationship is positive during turbulent economic times caused by COVID-19, supporting the resilience argument that product differentiation helps superior ESG performers during turbulent times as they face less elastic demand compared to their industry peers. Such a result supports the conclusion of Albuquerque *et al.* (2014) that investments in CSR to differentiate products reduce systematic risk. In line with the stakeholder theory, the first equation also shows that companies yield superior financial performance compared to their industry peers, as they address stakeholders' demands and needs beyond solely focusing on shareholders' profit

maximization. The positive link between ESG score and financial performance supports the RBV of the firm.

Addressing *H2*, the second equation shows that holding all other predictors constant, an ESG rating increase of one rating grade increases Tobin's Q ratio by 0.2376. This means that investors and shareholders value ESG performance, which is mirrored by a firm's market value. The equation results are consistent with the findings of Gillan *et al.* (2010), Borghesi *et al.* (2014), Gao and Zhang (2015), Plumlee *et al.* (2015), Velte (2017), Atan *et al.* (2018), Buchanan *et al.* (2018), Fatemi *et al.* (2018), Li *et al.* (2018), Yoon *et al.* (2018), Zhao *et al.* (2018), Aboud and Diab (2019), Chang *et al.* (2019), Dalal and Thaker (2019), Landi and Sciarelli (2019), Alareeni and Hamdan (2020), Abrams *et al.* (2021) and Wong *et al.* (2021). Such a finding supports stakeholder theory. It shows that disclosure and delivery of superior ESG performance are positively perceived by stakeholders and help build bonds and trust with them, which is then positively rewarded in the stock market. Established bonds and trust with stakeholders through ESG practices tend to help companies maintain good market performance during negative market periods caused by unexpected crises. This study supports stakeholder theory, as it shows that although the stock market was negatively impacted by COVID-19, companies with superior ESG performance managed to have higher market valuations compared to their industry peers. Such a finding is in line with the value creation theory, cost-of-capital reduction theory and RBV of a firm.

5.1 Theoretical implications

This study contributes to the existing research, company managers and investors in numerous ways. In terms of contribution to the existing theory and research, this study offers empirical evidence to help resolve confusion in the existing literature caused by contradictory evidence and competing explanations of the relationships between ESG performance and firms' financial performance and market valuations. It uses rigorous statistical analysis to provide convincing evidence based on 2017–2020 data for companies listed on the S&P 500 index. Additionally, this study takes advantage of the worldwide crisis caused by the COVID-19 pandemic and provides empirical evidence for an under-researched area – whether delivering superior ESG performance yields better financial and market performance during times of crisis. As such, this study provides empirical support to the stakeholder theory, value-creation theory, cost-of-capital reduction theory and RBV of a firm in arguing that delivering superior ESG performance positively impacts a firm's financial and market performance.

5.2 Practical and managerial implications

In terms of managerial contributions, evidence from this study shows that firm managers and decision-makers may positively influence a company's financial performance and market valuation by shifting focus toward ESG performance. Focusing on delivering ESG performance that is superior to that of industry peers may maximize the profitability of a firm and increase its market valuation. Consequently, the findings of this study suggest that managers and decision makers would benefit from prioritizing sustainability efforts when allocating company resources. Additionally, this study provides evidence that ESG aspects are extremely important financial-related aspects, which is why good ESG practices produce good financial and market results. Therefore, for managers and decision-makers, it makes sense to work on ESG practices and disclose ESG-related work, as it helps establish and maintain trust and friendship with stakeholders, which is financially rewarding during stable times as well as during times of crisis.

This study shows that investors should consider firms' ESG reports when making investment decisions. Because firms with superior ESG performance tend to have a higher market valuation, accounting for the ESG performance of the firm during investment decision-making could potentially lead to better investment performance.

5.3 Limitations and future research

Finally, concerning limitations, this study has a few limitations that could be addressed in future research. First, this study analyzes data from a four-year period, which may not produce the same sort of deep insights as a long-term study would. Second, this study uses the overall ESG scores of companies, that combine governance, environment and social performance into a single score but does not separate the impacts of each of the three ESG rating components. Third, the study inherits the flaws and subjectivity of the ESG ratings, which may diminish the validity of the results. ESG ratings of the companies depend highly on the disclosure and transparency of ESG practices by the companies themselves and the unique rating methodology used by ESG rating companies (Li and Polychronopoulos, 2020). Subjectivity in company ESG ratings becomes visible when comparing them across different ESG rating agencies. As an example, Table 16 has been generated to demonstrate that companies' ESG ratings may vary.

Finally, this study takes advantage of the data from 2019 to 2020, and the worldwide crisis caused by COVID-19 to test the ESG rating and financial performance relationship and the ESG rating and market valuation relationship in times of crisis, but it does not solely focus on this period. Consequently, not focusing solely on the data from the COVID-19 period may diminish the validity of the results to draw conclusions that ESG rating positively impacts a company's financial performance and market valuation in times when the stock market is negatively impacted by an unexpected worldwide crisis.

Consequently, we suggest areas for further research using the methods, application, level of analysis and theory (MALT) framework developed by Behl (2022).

5.3.1 Methods. We suggest replicating panel data regression analysis with long-term data analysis (e.g. over a 15–20-year period). This would help strengthen the findings. Additionally, such a longitudinal study would provide an opportunity to analyze the impact of various regulations and policies as incentives to deliver superior ESG performance (Velte, 2017).

5.3.2 Application. Although our results show that ESG rating positively impacts a firm's market valuation indicating that investors consider it in their decision-making, further research is needed to explore the weight of a firm's ESG rating in investors' investment decision-making criteria.

Table 16. Environmental, social and governance rating of selected S&P 500 companies from two different environmental, social and governance rating agencies

Company name	Sustainalytics rating*	MSCI rating**
The Walt Disney Co.	Low risk	BBB
Interpublic Group of Cos., Inc.	Low risk	BB
Intuitive Surgical, Inc	Medium risk	BB
Zimmer Biomet Holdings, Inc.	Medium risk	B
Nextera Energy, Inc	Medium risk	AAA
Duke Energy Carolinas LLC	Severe risk	A

Notes: *Sustainalytics rates companies on a five-scale grading system, with severe risk as the lowest grade and negligible risk as the highest grade; **MSCI rates companies on a seven-scale grading system, with CCC as the lowest grade and AAA as the highest grade

5.3.3 Level of analysis. Further research is needed to assess the impact of each ESG component on performance. That is, it is important to investigate the sole impact of each of the three ESG components on a company's financial and market performance. Such an investigation allows for an understanding of whether performance on one of the three ESG components is reflected more heavily in a company's financial and market performance than the others. Consequently, it would help business practitioners understand the impact of their specific ESG investments on their financial bottom line. Further, we recommend replicating this study using ESG rating data from multiple ESG rating companies and comparing the results. Considering that the same company may receive different ESG ratings across different rating agencies, investigating the ESG rating and financial performance relationship and the ESG rating and market valuation relationship using data from multiple rating agencies is likely to yield improved understanding and reduce confusion. Replicating this study by focusing on data from 2019 to 2022 would capture the impact of ESG ratings on a company's financial performance and market valuation during times of worldwide crisis.

5.3.4 Theory. This study offers empirical evidence to support the stakeholder theory, value-creation theory, cost-of-capital reduction theory and RBV of a firm on the ESG–financial–market valuation link. Yet, it does not explicitly test the underlying assumption of these theories. As such, we recommend further research on the ESG–financial–market valuation link focusing on the underlying assumptions of these theories. For instance, focusing on RBV, further research needs to explore how ESG activities help build tangible and intangible resources, which could allow a firm to mitigate future litigations and avoid potential future financial burdens.

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Further reading

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