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RESEARCH ARTICLE

CSR Performance and Firm Value: A Case Study from the S&P 500

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Abstract

This paper examines the association between CSR engagement and both firm value and goodwill. The sample data covers 497 firms from the S&P 500 Index. The period under review is from 2007 to 2021. This period was selected because it encompasses two major episodes of market disruption — the 2007–2009 global financial crisis and the COVID-19 pandemic — providing an empirically rich setting for assessing the resilience and valuation relevance of ESG performance across varying macroeconomic conditions. The findings carry implications for investors, suggesting that firms with strong ESG profiles may offer superior long-term value prospects. We use IV-GMM, with firm value as the dependent variable. In this study, the effect of CSR performance, represented by the ESG score, on the firm value is examined. The S&P 500 dataset provides an ideal empirical setting for examining this relationship, given its breadth, international relevance, and data quality. Our findings suggest that the overall ESG combined score is positively and significantly associated with firm value. Moreover, the ESG score has positive relationships with firm goodwill. Several unexpected findings also emerge, which are examined in detail in the empirical results section. Findings suggest that stronger ESG performance is associated with greater firm value and goodwill. The study provides a foundation for future inquiry into the long-term valuation consequences of corporate sustainability engagement.

Keywords ESG · Market Value · Profitability · CSR · S&P 500 · Goodwill · Equity Value · Firm

1. Background

Although Corporate social responsibility (CSR) engagement became widely institutionalized and increasingly visible in business practice during the 1980s and 1990s, its conceptual foundations predate this period. Early scholarly debates on the social responsibilities of business emerged as early as the mid-20th century. During the 1980s and 1990s, however, CSR engagement gained substantial prominence as firms globally began to place greater emphasis on managing relationships with a broad range of stakeholders. In this period, CSR engagement was increasingly framed as a strategic instrument, as companies recognized that engagement in social and environmental initiatives could significantly enhance corporate image and reputation, thereby increasing their attractiveness to employees, customers, and investors. Consequently, stakeholders came to expect firms not only to integrate CSR practices into their core activities but also to implement appropriate measures and communicate their CSR performance transparently. Companies typically report their CSR performance across three principal dimensions: Environment, Social, and Governance (ESG) activities. However, actions in this area often involve costs from a business perspective. A central question debated at the board level is whether such expenditures generate sufficient returns to justify the allocation of corporate resources. Increasingly, companies embed CSR commitments into their strategic vision and corporate

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governance frameworks. It should be noted that CSR activities not only bring advantages, but can also have disadvantages. While CSR engagement can strengthen corporate reputation and stakeholder relations, it inevitably competes with alternative uses of scarce organizational resources. Hence, it is worthwhile to examine the benefits and costs of CSR activities, particularly the impacts of CSR practices on a company's financial performance and value.

Numerous studies have explored the impact of Corporate social responsibility (CSR) practices on firm value and financial performance across various countries, yielding mixed results. Some researchers have found a positive relationship, while others have observed a negative or neutral relationship (Velte, 2022). This study aims to examine the effect of CSR on firm value by focusing on the largest global companies, specifically the S&P 500 firms, over a 15-year period from 2007 to 2021. As noted above, this period was characterized by pronounced market volatility, driven by the 2007–2009 global financial crisis and the COVID-19 pandemic (2020–2023). This paper examines whether superior CSR performance is associated with sustainable long-term value at the firm level. Aydogmus (2022) reports a positive association between ESG-based CSR performance and firm value. Stakeholder theory (Freeman, 1984) posits that successful businesses consider the interests of all stakeholders, leading to improved reputation. As it was mentioned earlier, ESG metrics capture a firm's performance across dimensions material to its broader stakeholder constituency (Kay et al., 2020). Some businesses use sustainability in order to gain competitive advantage; others see it as a regular business action (Ioannou & Serafeim, 2019). Businesses globally are voluntarily engaging in more CSR practices, indicating that they may be receiving some economic reward from these activities (Yoon et al., 2018). The association between ESG performance and firm financial outcomes has been debated in both academic and practitioner contexts for over a decade. While a growing body of research examines ESG and financial performance, existing studies predominantly focus on accounting-based measures such as ROA and ROE. Comparatively fewer studies jointly examine market-based firm value (Tobin's Q) and goodwill as dual outcomes, apply a 15-year panel spanning multiple market crises, and simultaneously compare results across seven industry sectors within a single large-cap index. ESG scores and firm-specific financial variables were sourced from the London Stock Exchange Group (LSEG) via its Refinitiv platform, which provides standardized, internationally comparable data widely employed in empirical capital-market research.

We started our analysis by selecting the largest 500 publicly listed firms in the world from the LSEG database spanning 15 years from 2007 to 2021. We matched and filtered for Refinitiv ESG score and ended up with 497 firms. Our final panel data contains 7,455 observations. We find that ESG performance has a positive and significant relationship with firm value. These findings provide suggestive evidence for corporate managers and policymakers regarding the potential valuation benefits of CSR investment.

Our study adds value to the existing literature in the following ways. Firstly, we analyzed the relationship between CSR practices and firm value following Aydogmus (2022), Shen and Chang (2009). We studied the global S&P 500 Index, which contains the largest multinational global corporations. We focus our attention on different industries and we compare the results of firms from different industries. The 15-year observation window provides sufficient temporal depth to identify structural ESG effects across varying market conditions. The S&P 500 was selected as the analytical universe because it comprises the largest, most internationally recognized publicly traded firms, facilitating comparability and ensuring data completeness. Our results suggest that firms more actively engaged in CSR activities are associated with significantly higher firm value. These findings are broadly consistent with Stakeholder theory, which posits that high CSR involvement is associated with benefits for all stakeholders. Secondly, we address the issue of the relationship between CSR practices and the goodwill of firms. Our findings are consistent with our expectation and indicate a positive association between CSR performance and goodwill.

The remainder of this paper is structured as follows. Section 2 reviews the prior literature on CSR and firm value. Section 2.5 develops the research hypotheses. Section 3 describes the data, variables, and estimation methodology. Section 4 presents the empirical results and discussion, and Section 5 concludes with practical and theoretical implications as well as limitations and directions for future research.

1.1. Carbon emission disclosure (S&P 500)

Carbon emission disclosure among S&P 500 companies has dramatically increased over the last decade, driven by investor demand, voluntary frameworks, and, increasingly, regulatory pressure. These large-cap companies are significantly more likely to disclose climate-related information than their smaller counterparts.

- Overall Reporting: Currently, over 95% of S&P 500 companies release some form of ESG (Environmental, Social, and Governance) or dedicated sustainability report.
- Climate Focus: A substantial majority of these companies specifically disclose climate-related information.
- The most commonly referenced frameworks used to structure this disclosure include the Task Force on Climate-related Financial Disclosures (TCFD), the Sustainability Accounting Standards Board (SASB), and the Global Reporting Initiative (GRI).

The proposed Securities and Exchange Commission (SEC) climate disclosure rule represents a significant shift in the U.S. regulatory approach to corporate climate reporting. If implemented, the rule would transform climate-related disclosures from a largely voluntary practice into a mandatory and auditable reporting requirement, formally integrated into firms' annual financial filings (Form 10-K). As a result, climate and carbon emissions data would be subject to the same internal controls, assurance standards, and legal scrutiny as traditional financial information, thereby increasing firms' exposure to regulatory and litigation risk in the event of misstatements or omissions.

This regulatory development aligns with the growing reliance of institutional investors, asset managers, and proxy advisory firms on carbon emissions data in their assessment of firm-level risk and long-term value. Investors increasingly incorporate carbon metrics to evaluate both physical risks arising from climate-related events and transition risks associated with regulatory changes, technological shifts, and evolving market preferences. These considerations directly influence portfolio construction, risk pricing, and capital allocation decisions. Moreover, the expansion of climate-focused benchmarks and investment products, such as the S&P 500 Carbon Efficient Index (CEI), further intensifies pressure on firms to enhance the quality, consistency, and credibility of their carbon disclosures. Inclusion in such indices depends not only on transparent reporting but also on firms' ability to demonstrate relatively efficient carbon performance, typically measured as emissions intensity relative to revenue. Consequently, companies face increasing incentives to improve both their disclosure practices and their carbon efficiency in order to remain attractive to ESG-oriented investors and competitive within capital markets.

2. Literature Review

Prior empirical research has predominantly examined the relationship between environmental, social, and governance (ESG) performance and accounting-based measures of firm profitability or overall operating performance, such as return on assets and return on equity. In contrast, the existing literature on ESG and market-based firm value remains fragmented and methodologically heterogeneous, producing mixed results that are difficult to reconcile across samples, regions, and time periods. Prior studies differ in their measurement of ESG, the choice of value proxy, the observation window, and the degree of sectoral disaggregation. No prior study has jointly examined Tobin's Q and accounting goodwill as dual value outcomes within a comprehensive S&P 500 panel covering 15 years and including both the 2007–2009 global financial crisis and the 2020 COVID-19 shock. This gap motivates the present study, which contributes by: (i) employing a large panel of 497 US-listed firms; (ii) using dual dependent variables capturing market and intangible value; (iii) conducting systematic cross-industry comparisons; and (iv) covering a period of exceptional market volatility.

2.1. Papers with findings of positive relationship between ESG performance and firm value

Alareeni et al. (2020) found that Environmental, Social, and Governance (ESG) disclosure has a positive impact on a firm's performance metrics. However, the study also reveals that positive aggregate effects may mask heterogeneity across ESG components, suggesting the importance of examining sub-dimensions individually. When ESG sub-components were examined individually, it was revealed that environmental (EVN) and Corporate social responsibility (CSR) disclosures were negatively associated with both Return on Assets (ROA) and Return on Equity (ROE). Conversely, EVN and CSR disclosures were positively correlated with Tobin's Q. In contrast, corporate governance (CG) disclosure exhibited a positive relationship with ROA and Tobin's Q, while showing a negative relationship with ROE. Additionally, the study indicated that firms

with higher assets and greater financial leverage tend to exhibit higher levels of ESG, CSR, EVN, and CG disclosures. Importantly, the study also highlighted that an increase in ESG, EVN, CSR, and CG disclosures is associated with higher ROA and ROE.

Aydogmus et al. (2022) reported that there is a positive relationship between ESG performance and firm value. The authors studied 5,000 global publicly listed companies. Jo and Harjoto (2011) also examined whether CSR performance is associated with firm value. Their results confirm a statistically significant positive association between CSR engagement and firm value. In addition, their research reports positive and significant associations between CSR scores and basic financial performance indicators, such as Return on Assets (ROA), Return on Equity (ROE), and Earnings per Share (EPS). Shekar and Kumaran (2019) have also been able to determine a positive effect of CSR activities on company performance. The 100 largest Indian companies were examined based on their market capitalization for the years 2018 to 2022. In addition to positive evidence on the relationship between CSR activities and corporate performance, the authors found that, on average, CSR expenses increased annually. Velte (2017) reports that Environmental, Social, and Governance (ESG) factors are positively associated with firm value, as measured by Tobin's Q, and profitability, as reflected in Return on Assets (ROA), for firms in Germany. Additionally, the study highlights the significant impact of governance on financial performance.

Yoon et al. (2018) examined the relationship between Environmental, Social, and Governance scores and market value in South Korea, finding that Corporate Social Responsibility (CSR) initiatives notably affect a company's market value. The magnitude of this effect, however, varies across firm characteristics, suggesting that firm-level heterogeneity mediates the ESG–value relationship. Zhao et al. (2018) investigated listed energy enterprises in China and discovered that superior ESG performance may contribute to improved financial outcomes. Fatemi et al. (2018) analyzed US firms between 2006 and 2011, reporting a significant positive association between robust ESG activities and firm value. The authors also noted that comprehensive ESG reporting is associated with higher firm valuation, partly by reducing the apparent impact of deficiencies and accentuating the effects of strengths. Finally, Giannopoulos et al. (2022) studied the relationship between ESG scores and financial performance of Norwegian firms over the period from 2010 to 2019, reporting mixed results, with a generally positive association between ESG scores and firm value, as measured by Tobin’s Q.

Bhaskaran et al. (2020) examined the impact of Environmental, Social, and Governance (ESG) factors on the financial performance of 4,887 firms over the period from 2014 to 2018, using firm value (Tobin's Q) and operational performance (Return on Equity and Return on Assets) as dependent variables. Their findings indicate that firms excelling in environmental, governance, and social dimensions tend to exhibit greater market value. Similarly, De Lucia et al. (2020) analyzed a sample of 1,038 publicly listed firms across 22 European countries from 2018 to 2019, revealing a positive association between ESG variables and financial performance, particularly Return on Equity and Return on Assets. In a related study, Naeem et al. (2022) investigated the effects of ESG performance on both financial performance and firm value, finding a positive and significant relationship between ESG scores and firm value (Tobin's Q) as well as profitability (ROA). Additionally, Chairani and Siregar (2021) conducted a study on listed firms in Asia, specifically in Indonesia, Malaysia, the Philippines, Singapore, and Thailand, over the period from 2014 to 2018. Their results demonstrate that ESG performance enhances the effectiveness of enterprise risk management (ERM), with ERM showing a positive relationship with both firm value and profitability. Li et al. (2018) utilized a cross-sectional dataset of 367 FTSE-listed companies spanning from 2004 to 2013 to examine whether ESG reporting enhances firm value. Their findings reveal a strong relationship between the level of ESG reporting and firm value, suggesting that stakeholder trust and accountability positively influence firm performance. Similarly, Ahmad et al. (2021) investigated the effect of ESG on the financial performance of 351 FTSE350 companies over the period from 2002 to 2018. Their findings reveal a strong relationship between the level of ESG reporting and firm value, supporting the notion that stakeholder trust and accountability mediate the ESG–performance link. In a related study, Abdi et al. (2022) analyzed the effect of ESG scores on firm value and profitability within the aviation industry, using data from 38 airlines between 2009 and 2019. They report that investments in governance enhance firms' market-to-book ratio, while involvement in both social and environmental aspects contribute to improved operational efficiency.

O’Riordan and Hampden-Turner (2021) have focused on the German equity market by examining the three largest market indices (DAX, MDAX, SDAX). The authors carried out a content analysis in which they analyzed the degree of disclosure of CSR information. A total of 370 companies were analyzed between 2005 and 2008. A slight positive correlation was found between the publication of CSR information and the share price. When analyzing sub-aspects of the CSR factors, a stronger correlation was found for social CSR

publications. However, the study highlights that disclosure alone does not necessarily reflect actual CSR engagement, underscoring the need for careful interpretation of ESG metrics.

Khanchel et al. (2023) focused on the implementation of CSR strategies by observing the French capital market. A total of 464 French companies were examined, with financial firms excluded. The companies were segmented into three categories: CSR Adopters, Active CSR Adopters, and Non-CSR Adopters. The respective ESG scores from the Asset 4 database (Reuters) were used as the basis for the CSR strategies. The temporal focus of the studies was on the outbreak of the COVID-19 pandemic and its aftermath. The study finds that underperforming CSR adopters generated higher abnormal returns during the pandemic period. However, firms with active CSR strategies also exhibited greater sensitivity to adverse market shocks, suggesting that ESG commitment does not uniformly confer downside protection.

Feng et al. (2021) likewise document a positive association between CSR engagement and financial performance, drawing on survey data from the 25 largest Italian manufacturing firms.

Examining longer-term dynamics, Buallay (2019) analyses 235 EU-listed banks and finds that ESG disclosure positively influences multiple performance indicators, including return on assets, return on equity, and transaction quality. The study further notes that banks with higher financial leverage and larger asset bases tend to report higher ESG scores, and argues that sustained sustainability reporting may generate broader macroeconomic benefits.

2.2. Papers with findings of negative relationship between ESG performance and firm value

While many studies report positive effects, a significant strand of literature identifies negative relationships between ESG performance and firm value, highlighting that ESG engagement can sometimes entail costs that outweigh market benefits. For example, Brammer et al. (2006)studied the impact of CSR on firms in the United Kingdom using market returns and reported that low social score firms perform better than the market. Landi and Sciarelli (2019)studied 54 listed Italian companies from 2007 to 2015 and also reported a negative relationship between their ESG scores and financial performance. Folger-Laronde et al. (2020) explored the relationship between ESG ratings and financial returns of Exchange-Traded Funds (ETFs) during the COVID-19 pandemic in Canada. Their findings indicate that high ESG performance in ETFs does not necessarily provide protection during significant market downturns. These findings suggest that ESG may not uniformly serve as a risk mitigation tool, particularly under extreme market stress. Nollet et al. (2016) utilized both accounting and market metrics to examine the connection between social and financial performance of S&P 500 firms between 2007 and 2011. Their results revealed a negative relationship in linear models, while a positive relationship was observed in non-linear models. This indicates that the ESG–value relationship may be context-dependent and potentially non-linear. Marsat and Williams (2011) identified a negative correlation between CSR ratings and firm value using global MSCI ESG ratings. Duque-Grisales and Aguilera-Caracue (2021) studied 104 Latin American companies from 2011 to 2015, finding a negative relationship between ESG scores and financial performance for these firms. Finally, Garcia and Orsato (2020) conducted a comparison between emerging and developed markets, analyzing 2,165 firms from 2007 to 2014. Their study demonstrated that in emerging markets, the relationship between ESG scores and financial performance is negative. Vishnu Nampoothiri et al. (2024) analyzed companies in the European Union and members of the European Economic Area for the period 2015 to 2019 by examining CSR disclosures and the impact on Tobin's Q. In principle, the authors were unable to find a positive effect between CSR and company value, as the additional costs of the necessary CSR disclosures negated the actual increase in value. Only a segment analysis of companies from the transportation and utilities sectors showed a slight correlation between CSR and company value.

Overall, this literature highlights that ESG engagement is not universally beneficial and underscores the importance of considering firm- and country-specific factors, the type of ESG activity, and the potential trade-offs between costs and value creation.

2.3. Papers with findings of mixed relationship between ESG performance and firm value

A third strand of research reports mixed or insignificant results, reflecting the unresolved debate over ESG's economic relevance. Atan et al. (2019) examined the impact of ESG scores on profitability, firm value, and cost of capital for listed companies in Malaysia. Their findings revealed no significant relationship between ESG scores and either firm value or profitability. Furthermore, none of the ESG factors showed any significant connection with the average cost of capital. Saygili et al. (2021) studied the effect of ESG performance on the financial performance of listed companies in Turkey between 2007 and 2017. Their results indicated that environmental reporting is negatively related to financial performance, while stakeholder involvement in management is positively associated with the social dimension, and governance factors are positively correlated with financial performance. Behl et al. (2022) explored the relationship between ESG reporting and firm value within India's energy sector, reporting mixed results. Finally, Lopez-de-Silanes et al. (2020) conducted a multinational study investigating the relationship between ESG reporting and quality, finding that ESG scores have no significant impact on firm financial performance. Nevrela (2022) examined the actual impact of CSR activities on the value or goodwill of companies. A sample was selected based on the 15 largest European countries between 2010 and 2017. A total of 5,678 observations were examined, with CSR activity being determined using the Thomson Reuters ESGENV, ESGSOC, and ESGGOV scores. A short-term effect of governance activities on goodwill could be identified, whereas other activities did not provide significant values. Gonçalves et al. (2023) took a closer look at CSR activities and their influence on goodwill impairment. They found that goodwill is mainly influenced by economic factors and that corporate governance activities play a subordinate role. These mixed findings underscore that the ESG–firm value link is highly context-sensitive, possibly dependent on measurement methods, temporal factors, or the specific ESG components analyzed.

2.4. Impact of Goodwill

Mushafiq et al. (2023) mentioned the importance of Stakeholder theory in providing a strong support for the mediation mechanism of goodwill. When businesses actively improve their CSR performance, they build positive relationships with their stakeholders, which leads to the development of their goodwill. This accumulated goodwill is, in turn, associated with stronger firm's reputation, and attracting investments during tough times. The importance of CSR in fostering goodwill among a company's key stakeholders is vital to the success of the company's prosocial programs (Black, 1994; Sen, 1993). Although there are approaches that give businesses a structure for managing their traditional product offerings and brand persona, these approaches have not yet been used to analyze an organization's CSR operations and goodwill initiatives from the outside (Murray and Vogel, 1997). Ramesh et al. (2019) mentioned that companies engage in CSR practices because they believe this will may be associated with higher goodwill and improved boost sales, profitability and improve firm performance further. Therefore, CSR serves as an effort on the part of a firm to meet hopes for further development (Steurer et al., 2012). Engaging in CSR projects can boost a company's image and goodwill in the eyes of the public (Houston and Johnson, 2000; Luo and Bhattacharya, 2006). Where goodwill is strong, sales tend to be higher, which is associated with greater firm value (Roberts and Dowling, 2002). It is important for companies to keep their stakeholders informed on their CSR efforts. Therefore, it is one thing for a firm to start CSR activities, and it is another for those activities to reach all stakeholders indiscriminately. It is only when the latter happens that the former may succeed in winning over the goodwill of those stakeholders. (Asemah et al., 2014)

Recent literature (2020–2026) suggests that corporate social responsibility (CSR) is increasingly driven by a blend of institutional pressures and shareholder demand for transparency, with CSR acting as a mechanism for reducing information asymmetry. Institutional investors, including pension funds and banks, now actively influence corporate behavior, often viewing CSR as a strategy to lower investment risk. Signaling theory is focused on Positive Financial Signals, which indicate that CSR disclosures, particularly regarding environmental and employee health initiatives, are positively associated with firm value and stock prices in some contexts. The signaling effect is stronger in emerging markets and high-pollution industries, where stakeholders may place higher value on responsible conduct. Firms adopt CSR practices to gain legitimacy, conforming to social and regulatory norms. Institutional shareholders are moving away from passive roles, actively participating in governance to demand social responsibility. The literature increasingly treats

signaling, institutional, and stakeholder theories as complementary rather than competing frameworks. Hamzeh Al Amosh and Saleh F. A. Khatib (2022) evaluate the intersections of stakeholder, legitimacy, and signaling theories regarding corporate reporting transparency.

2.5. Hypotheses development

Following the literature review, we expect that high performance on ESG scores may have a positive impact on firm value for the S&P 500. The following hypotheses are presented in the study:

- **Hypothesis 1**
  ESG scores are positively and significantly associated with firm value.
- **Hypothesis 2**
  ESG scores are positively and significantly associated with goodwill.

3. Methodology

This section is focused on sample data, variables, descriptive methodology.

3.1. Sample data

This study focuses on firms constituting the S&P 500 index, sourced through the London Stock Exchange Group (LSEG) database, over the period from 2007 to 2021, resulting in an unbalanced panel of 7,500 firm-year observations. LSEG, through its Refinitiv platform, provides comprehensive and internationally comparable financial and environmental, social, and governance (ESG) data for large publicly traded firms, making it a widely used and reliable data source in empirical capital-market research. Its standardized ESG metrics allow for consistent measurement across firms and over time, which is particularly important for longitudinal analyses. After restricting the sample to firms with available ESG scores in the Refinitiv database, the final sample consists of 497 firms and 7,455 firm-year observations.

3.2. Dependent variables

Tobin's Q is employed as a way to measure firm value (Atan et al., 2019;Dalal & Thaker, 2019;Saygili et al., 2021; Giannopouls et al., 2022;Naeem et al., 2022). We obtained all variables from the LSEG database. Tobin's Q is assumed to be a proxy for the market value of a firm.

Another dependent variable is goodwill, which was employed in the study.

3.3. Independent variables

The primary independent variable is the composite ESG score obtained from LSEG (Refinitiv), comprising three sub-scores: Environmental, Social, and Governance performance. The following researchers used a similar method: Aydogmus (2022), Duque-Grisales & Aguilera-Caraculs (2021);Chairani & Siregar (2021); Giannopouls et al.(2022);Naeem et al. (2022); Mushafiq (2024). LSEG (Refinitiv) provides one of the highest-quality ESG datasets in the market, with data going back to the early 2000-s. Three pillars and their themes are as follows: Environment (emissions, innovation, and resource usage), Social (human rights, workforce, product responsibility, and community), and Governance (shareholders, management, and CSR Strategy). Table 1 describes the ESG score range obtained from LSEG (Refinitiv).

3.4. Control variables

The model incorporates five control variables: firm size (logarithm of total assets), financial leverage (total debt-to-total-assets ratio), firm age, innovation intensity (R&D expenditure as a share of total revenue), and default risk (probability of default within 12 months, sourced from the Credit Research Initiative). Innovation

is calculated as Research and Development Expenses out of total revenue. Default risk is the probability of default within the upcoming 12 months obtained from the Credit Research Institute. All variables are presented in Table 2 below.

3.5. Descriptive statistics

The final dataset comprises 497 S&P 500 firms observed over the period 2007–2021, yielding 7,455 firm-year observations. The Independent variable is ESG score. Two separate regression models are estimated. In Model 1, the dependent variable is Tobin's Q (firm value), and goodwill is included as a control variable alongside size, age, leverage, innovation, and default risk, with the ESG score as the primary independent variable. In Model 2, the dependent variable is goodwill, and the same set of control variables is used (excluding goodwill itself), again with the ESG score as the primary independent variable We separate firms based on their industries. There are such industries as manufacturing, energy, financials, healthcare, utilities and telecommunication. Table 3 provides descriptive statistics. We also note that the standard deviation for each variable is within the predicted range. Independent variables and control variables are also reported, as summarized well.

We employ two models to investigate research objectives of the study, one for Tobin's Q and one for goodwill. Many researchers employed Tobin's Q as a dependent variable (Giannopoulos et al., 2022; Naeem et al., 2022). In addition, Giannopoulos et al., 2022 and Naeem et al., 2022 defined Size and Leverage as control variables. We run two models demonstrated below to estimate our results:

$$\textit{Tobin's Q} = b0 + b1 \times \textit{ESGT-1} + b2 \times \textit{Size T-1} + b3 \times \textit{Leverage T-1} + b4 \times \textit{Age T-1} + b5 \times \textit{Innovation T-1} + b6 \times \textit{Default risk} + e\,it \quad (1)$$

$$\textit{Goodwill} = b0 + b1 \times \textit{ESGT-1} + b2 \times \textit{Size T-1} + b3 \times \textit{Leverage T-1} + b4 \times \textit{AgeT-1} + b5 \times \textit{Innovation T-1} + b6 \times \textit{Default risk} + e\,it \quad (2)$$

4. Results

4.1. Correlation results

The correlation coefficients of variables studied are reported in Table 4 below. The correlation coefficients between CSR engagement (ESG score) and Tobin's Q, (ESG score) and Size, and CSR performance (ESG score) and Leverage are positive and insignificant. The positive correlations between CSR performance and control variables are consistent with the view that firms engaged in CSR activities tend to exhibit higher firm value. It can be noticed that there is a positive correlation between CSR performance and age of the firm as well. Larger firms, older firms, or firms with greater leverage tend to be actively involved in CSR activities. No evidence of multicollinearity is detected among the regressors. No evidence of multicollinearity is detected. This is confirmed by variance inflation factor (VIF) diagnostics: all variables in the final specification have VIF (variance inflation factor) ratios below or equal to 10.2. Panel unit root tests are applied to assess the stationarity of all variables.

4.2. Test results and discussion

The augmented Dickey–Fuller (ADF) test confirms that all variables are stationary in levels, precluding the need for differencing prior to estimation. To address potential endogeneity between ESG performance and firm value, instrumental variable GMM (IV-GMM) estimation is employed. ROE (Return on Equity) was employed as an exogenous variable. To address potential cross-sectional dependence — common in large panel datasets — the Pesaran (2004) CD test was applied. Results confirm the presence of cross-sectional dependence; consequently, Driscoll–Kraay standard errors (Driscoll & Kraay, 1998) are employed throughout all reported regressions, ensuring robustness to both cross-sectional dependence and heteroscedasticity.

$$Tobin's\ Q = b0 + b1 \times ESGT\text{-}1 + b2 \times Size\ T\text{-}1 + b3 \times Leverage\ T\text{-}1 + b4 \times Age\ T\text{-}1 + b5 \times GoodwillT\text{-}1 + b6 \times Innovation\ T\text{-}1 + b7 \times Default\ risk + e\ it$$

A one-unit increase in the ESG score is associated with a 15.26 percentage-point higher Tobin's Q for firms in the energy sector. This pronounced effect is consistent with the materiality hypothesis: ESG factors are particularly value-relevant in capital-intensive, high-emission sectors where regulatory risk, reputational exposure, and stakeholder scrutiny are elevated (Khan et al., 2016). In these industries, credible ESG commitments may be associated with lower perceived regulatory transition risk and a reduced equity risk premium, which in turn could be reflected in higher market valuations. This pattern is consistent with the view that investors may value firms with strong ESG credentials as possessing superior non-physical assets — including reputation, stakeholder relations, and risk mitigation capacity — that are associated with future value creation. A similarly strong ESG–value association is observed in the manufacturing sector. Firms in energy and manufacturing exhibit the most pronounced positive ESG–value associations. The results for such industries as financials, utilities, and telecommunications are weaker. The financial sector is known for lower engagement in carbon emissions and pollution. The attenuated ESG effect in financial and services sectors may reflect the fact that ESG risks are less tangible and more diffuse in these industries, making it harder for markets to price ESG improvements directly. This aligns with sector-specific materiality findings of Damulis and Mattisson (2022) and the mixed results documented for service-oriented firms in the prior literature. The negative associations of firm size and leverage with Tobin's Q are confirmed in the pooled specification, consistent with the sector-level discussion above. Age, goodwill, and innovation are positively but insignificantly associated with firm value, and default risk is negatively and insignificantly associated with firm value. Among the three ESG sub-dimensions, the Environmental (E) score exhibits the strongest positive association with Tobin's Q, suggesting that environmental performance is the primary value-relevant dimension of ESG for large-cap US firms. Leverage negatively affects firm value because it creates additional risk. The literature on the effect of size and leverage on firm value is mixed. For example, Hirdinis (2019) found a negative relationship between firm size and firm value, confirming our results. Ibrahim and Isiaka (2020) and Yuwono and Aurelia (2021) reported a negative effect of leverage on firm value, confirming our results.

In summary, ESG score is positively and significantly associated with firm value (Tobin's 2019). Age, goodwill, and innovation are positively but insignificantly associated with firm value, while size and leverage are negatively associated — as contextualized above. Default risk is negatively and insignificantly associated with firm value. These findings are consistent with Aydogmus (2022).

$$Goodwill = b0 + b1 \times ESGT\text{-}1 + b2 \times Size\ T\text{-}1 + b3 \times Leverage\ T\text{-}1 + b4 \times Age\ T\text{-}1 + b5 \times Innovation\ T\text{-}1 + b6 \times Default\ risk + e$$

The results of both regressions are reported in Tables 5 and 6. The regression results indicate that most variables are positively and significantly associated with goodwill, a pattern consistent with multiple channels through which established firm characteristics accumulate intangible value. A one-unit improvement in the firm's CSR performance is associated with a significant increase in Goodwill, especially for firms from such industries as manufacturing, energy, and financial services. Consistent with the Tobin's Q results, firms in energy and manufacturing exhibit the most pronounced positive ESG–goodwill association. This pattern is consistent with the view that social reputation and stakeholder trust are reflected in recognized intangible value, in line with signaling and stakeholder theories. Innovation is also positively and significantly associated with goodwill, particularly among energy and manufacturing firms. Surprisingly, leverage is positively and significantly associated with goodwill across all sectors. This counter-intuitive finding warrants careful contextualization. In accounting, goodwill is the premium recognized when one entity acquires another above its net book value. Firms that grow through debt-financed acquisitions — common among large S&P 500 companies — mechanically accumulate greater recognized goodwill on their balance sheets. The positive leverage–goodwill association may therefore partly reflect this acquisition channel. A complementary explanation is that firms with strong intangible asset bases attract higher debt capacity, generating a positive association that runs through firm quality. This finding should be read as a correlation, not a causal claim. Size and Age both have a positive and significant relationship with Goodwill. Larger and older firms tend to have more established brands, wider customer bases, and greater market presence, naturally leading to a higher accumulated Goodwill value. Default risk is negatively associated with goodwill for firms in the energy and

manufacturing sectors. This is expected, as high financial instability erodes the perceived value of a firm's intangible assets, reducing its overall Goodwill.

4.3. Additional robustness test

As a robustness check, pooled regressions are estimated for the full sample, decomposing the composite ESG score into its three constituent sub-scores: Environmental (E), Social (S), and Governance (G). As reported in Tables 7 and 8, the results show a positive relationship between the ESG score and Tobin's Q when we run the first model. In terms of the second model, goodwill is also positively correlated with the ESG score. A one-unit increase in the ESG score is associated with a 7.48 percentage-point higher Tobin's Q across the full sample. When we compare ESG scores and control variables for all industries, the results show that the impact of company size on firm value (Tobin's Q) is negative, which confirms our previous results. The impact of leverage on firm value (Tobin's Q) is negative as well. Age, goodwill, and innovation positively and insignificantly affect firm value. The default risk has a negative and insignificant relationship with firm value. When we compare E, S, and G, we notice that E (Environmental score) has the greatest influence on firm value (Tobin's Q).

$$Tobin's\ Q = b0 + b1\ x\ ESGT\text{-}1 + b2\ x\ Size\ T\text{-}1 + b3\ x\ Leverage\ T\text{-}1 + b4\ x\ Age\ T\text{-}1 + b5\ x\ GoodwillT\text{-}1 + b6\ x\ Innovation\ T\text{-}1 + b7\ x\ Default\ risk + e\ it$$

$$Goodwill = b0 + b1\ x\ ESGT\text{-}1 + b2\ x\ Size\ T\text{-}1 + b3\ x\ Leverage\ T\text{-}1 + b4\ x\ Age\ T\text{-}1 + b5\ x\ Innovation\ T\text{-}1 + b6\ x\ Default\ risk + e$$

The results show that most variables are positively and significantly related to a firm's Goodwill. A one-unit increase in the ESG score is associated with a 7.31% higher goodwill value across the full sample. Innovation is another strong, positive driver of Goodwill. As in the sector-level regressions, leverage is positively associated with goodwill; as discussed above, this likely reflects the role of debt-financed acquisitions in generating recognized goodwill rather than a direct causal effect of leverage. Size and Age both have a positive relationship with Goodwill. When we compare E, S and G, we notice that E (Environmental score) has the greatest effect on Goodwill. These results are fully consistent with the sector-level findings reported above, reinforcing the overall robustness of the main conclusions.

5. Conclusion

This study examined the association between ESG-based CSR performance and both firm value and goodwill, drawing on a panel of 497 S&P 500 firms observed over the period 2007–2021 — a window that encompasses both the global financial crisis and the COVID-19 pandemic.

We employed IV-GMM regression in our study. Based on the results of the first model, where firm value was the dependent variable, we find that the ESG score has a positive and significant relationship with firm value. The positive association between ESG performance and Tobin's Q is consistent with the view that markets may price credible ESG signals into equity valuations, rewarding firms whose sustainability commitments align with stakeholder expectations. This interpretation is indicative rather than causal, as this study is observational in design. The results of the second model further indicate that goodwill is positively associated with CSR performance. When we test the same regressions for manufacturing firms, we confirm that the positive ESG–value association is especially pronounced among manufacturing firms. For manufacturing firms, the ESG–goodwill association is likewise especially strong. We focus our attention on different industries and compare the results of firms from different industries. The manufacturing sector merits particular attention given the especially pronounced ESG–value relationship observed in that industry. Goodwill and innovation are positively associated with firm value. Goodwill is in turn positively associated with both innovation and leverage; the latter association reflects the role of acquisition activity rather than a direct causal effect of debt, as contextualized in Section 4.

The findings of this study have several implications for investors and corporate decision-makers. The positive association between ESG performance and firm value suggests that investors may increasingly be attracted to firms with strong ESG profiles, viewing them as better positioned to manage long-term risks and

opportunities. For managers, the results provide suggestive evidence that allocating resources toward CSR initiatives may be associated with positive market valuations, as higher ESG performance is consistently associated with higher Tobin's Q in this sample. This evidence may help justify investments in sustainability-related activities, such as enhanced environmental management, social engagement, and governance structures, not only from an ethical perspective but also from a value-creation standpoint. Our results support stakeholder theory.

From a theoretical perspective, this study contributes to the ongoing debate in the literature regarding the relationship between ESG performance and firm value. While prior research has produced mixed results, particularly when focusing on accounting-based performance measures, the present findings lend support to stakeholder and legitimacy theories, which argue that firms benefit economically from aligning their activities with stakeholder expectations and societal norms. By emphasizing market-based valuation outcomes, this study extends existing literature that predominantly examines profitability measures and is consistent with the view that ESG performance is associated with capital market valuations, especially among large, publicly traded firms.

Despite its contributions, this study is subject to several limitations that offer opportunities for future research. First, the analysis focuses on large firms within a single data framework, which may limit the generalizability of the findings to smaller firms or different institutional settings. Future research could expand the geographical scope to include firms from regions such as Western Europe, Asia, Australia, and Canada, allowing for cross-country comparisons. Second, while this study employs firm value as the primary outcome variable, subsequent studies could incorporate alternative financial performance measures to further assess the robustness of the ESG–performance relationship. Finally, future research may benefit from examining specific ESG dimensions or sustainability-related topics in greater depth, such as alignment with the Sustainable Development Goals, human rights practices, carbon emissions disclosure, or the effectiveness of active CSR initiatives.

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Data availability Data is available upon request from corresponding author.

Declarations

Competing Interests The authors declare no competing interests.

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List of abbreviations

- **CRFD** -Climate-related Financial Disclosures
- **CSR-** Corporate social responsibility
- **ESG** stands for Environmental, Social, and Governance, and it refers to a set of standards used to measure a company's sustainability and impact on society.
- **GRI** -Global Reporting Initiative
- **SASB-** Sustainability Accounting Standards Board
- **Tobin's Q –** Market value of equity
- **TCFD**- Task Force on Climate-related Financial Disclosures
- **ROA** – Return on Assets
- **ROE**- Return on Equity

Annexure: Tables Legend

Table 1. Refinitiv ESG score range. Refinitiv (2022)

Score Range	Description
0 - 25	Scores in this range imply poor relative ESG performance and insufficient transparency in the public disclosure of relevant ESG data.
26 - 50	Scores in this range imply satisfactory relative ESG performance and moderate transparency in the public disclosure of relevant ESG data.
51 - 75	Scores in this range imply good relative ESG performance and above average transparency in the public disclosure of relevant ESG data.
76 - 100	Scores in this range imply excellent relative ESG performance and high degree transparency in the public disclosure of relevant ESG data.

Table 2. Summary of variables.

Dependent Variables	Description/Formula
TQ - Tobin's Q	Market (Equity) Value or firm value
Goodwill	Goodwill of a firm
Independent Variables	
ESG_Combined Score	LSEG score
Control Variables	
Size	Logarithm of Total Assets
Leverage	Total Debt/Total Ass
Age	Number of years the firm exists
Innovation	R&D expenditure as a percentage of Revenue
Default risk	Probability of default within next 12 months

Table 3. Descriptive statistics.

	N	Mean	St. Dev	Min	Median	Max
Dependent Variables						
Tobin’s Q	7,455	2.6680	2.8870	0.223	1.8750	81.9860
Goodwill	7,455	6.0340	0.1827	0.983	3.4850	12.9380
Independent Variables						
ESG	7,455	33.8760	25.6450	0.000	42.9830	96.9650
Control Variables						
Log_TASST	7,455	11.7640	2.2431	1.660	9.7750	22.8750
TD to TA	7,455	0.2412	0.2255	0.000	0.2310	3.3392
Age	7,455	31.0730	0.1723	0.000	32.9840	168.2800
Innovation	7,455	20.9200	0.0928	0.000	21.0700	43.9800
Default risk	7,455	0.0390	0.0001	0.001	0.0483	0.0901

Table 4. Correlation matrix

	Tobin's Q	Goodwill	ESG	Size	Age	Innovation	Default risk
Tobin's Q	1						
Goodwill	0.0344	1					
ESG	0.0388	0.0216	1				
Size	0.0277	0.0155	0.0018	1			
Leverage	0.0002	0.0001	0.0001	0.0022	1		
Age	0.0001	0.0003	0.0002	0.0016	0.0001	1	
Innovation	0.0021	0.0028	0.0001	0.0018	0.0001	0.0003	1
Default risk	-0.0018	-0.0027	-0.0002	0.0021	0.0001	-0.0003	1

Table 5. IV- GMM Regression Results

$$Tobin's\ Q = b0 + b1 \times ESG_{T-1} + b2 \times Size_{T-1} + b3 \times Leverage_{T-1} + b4 \times Age_{T-1} + b5 \times Innovation_{T-1} + b6 \times Default\ risk + e_{it} \quad (1)$$

Variables	*Energy*	*Manufacturing*	*Financials*	*Utilities*	*Telecom*	*IT*	*Healthcare*
ESG	**0.1526*****	**0.1204****	0.0854*	0.0549***	0.0504**	0.0430***	0.0844**
	(9.78)	(8.59)	(8.09)	(10.73)	(9.49)	(9.95)	(9.44)
Size	-0.0255**	-0.0472***	-0.0249*	-0.0938**	-0.0855**	-0.0763**	-0.0639**
	(-11.46)	(-10.91)	(-9.98)	(-11.44)	(-10.54)	(-11.09)	(-9.53)
Leverage	-0.0757**	-0.0742***	-0.0798**	-0.0723***	-0.0759**	-0.0724***	-0.0755***
	(-11.75)	(-11.62)	(-10.48)	(-11.03)	(-11.27)	(-10.17)	(-11.24)
Goodwill	0.1155***	0.1188**	0.1109**	0.1167**	0.1297**	0.1148*	0.1101**
	(14.39)	(12.31)	(11.99)	(9.96)	(9.95)	(7.99)	(8.91)
Innovation	0.0992**	0.0959***	0.1129**	0.0989*	0.0958*	0.0898**	0.0795**
	(10.79)	(9.96)	(9.55)	(10.45)	(9.88)	(11.82)	(10.98)
Default risk	-0.0121***	-0.0196***	-0.0301***	-0.0002*	-0.0009*	-0.0092**	-0.00153*
	(-10.68)	(-10.84)	(-10.88)	(-10.27)	(-11.95)	(-11.62)	(-11.77)
constant	4.78	5.76	5.99	6.06	6.95	4.53	5.81
N	193	284	126	103	30	663	511
F	**17.34**	**17.88**	**18.43**	**17.55**	**17.32**	**16.09**	**17.22**
R^2	0.1431	0.1208	0.0852	0.0821	0.0609	0.0702	0.0621
P-value	0.0000	0.0001	0.0001	0.0000	0.0000	0.0001	0.0001

*p < 0.1; **p < 0.05; ***p < 0.01.

Table 6. Goodwill's IV- GMM Regression Results

$$Goodwill = b0 + b1 \times ESG_{T-1} + b2 \times Size_{T-1} + b3 \times Leverage_{T-1} + b4 \times Age_{T-1} + b5 \times Innovation_{T-1} + b6 \times Default\ risk + e_{it} \quad (2)$$

Variables	*Energy*	*Manufacturing*	*Financials*	*Utilities*	*Telecom*	*IT*	*Healthcare*
ESG	**0.1233****	**0.1302*****	0.0955**	0.0177**	0.0192***	0.0599**	0.0432***
	(11.82)	(11.71)	(11.90)	(11.43)	(11.77)	(11.74)	(11.87)
Size	0.0471*	0.0418**	0.0378*	0.0456*	0.0349*	0.0311*	0.0187*
	(20.55)	(19.81)	(18.50)	(18.90)	(15.54)	(13.11)	(13.46)

*p < 0.1; **p < 0.05; ***p < 0.01.

Table 6 (cont.). Goodwill's IV- GMM Regression Results

$$Goodwill = b0 + b1 \times ESG_{T-1} + b2 \times Size_{T-1} + b3 \times Leverage_{T-1} + b4 \times Age_{T-1} + b5 \times Innovation_{T-1} + b6 \times Default\ risk + e_{it} \quad (2)$$

Variables	*Energy*	*Manufacturing*	*Financials*	*Utilities*	*Telecom*	*IT*	*Healthcare*
Leverage	0.1123**	0.1304***	0.1231**	0.1221***	0.1293**	0.1203***	0.1253**
	(19.85)	(19.29)	(17.49)	(15.95)	(18.79)	(12.93)	(14.79)
Innovation	0.1836**	0.1788***	0.1287**	0.0429**	0.0893*	0.0725*	0.0799**
	(14.99)	(15.69)	(15.89)	(15.94)	(17.49)	(18.79)	(16.96)
Default risk	-0.0186**	-0.0159***	-0.0015**	-0.0001**	-0.0001**	0.0001**	-0.0001**
	(-14.99)	(-14.65)	(-15.49)	(-15.58)	(-16.29)	(-15.79)	(-15.26)
constant							
N	193	284	126	103	30	663	511
F	**18.63**	**17.58**	**16.88**	**18.27**	**19.49**	**16.42**	**15.94**
R^2	0.1213	0.1367	0.1158	0.0767	0.0447	0.0601	0.0408
P-value	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0000

*p < 0.1; **p < 0.05; ***p < 0.01.

Table 7. IV- GMM Regression Results

$$Tobin's\ Q = b0 + b1 \times ESG_{T-1} + b2 \times Size_{T-1} + b3 \times Leverage_{T-1} + b4 \times Age_{T-1} + b5 \times Goodwill_{T-1} + b6 \times Innovation_{T-1} + b7 \times Default\ risk + e_{it}$$

Variables	
ESG	0.0748***
	(9.23)
E	0.0573***
	(11.34)
S	0.0177***
	(13.45)
G	0.0189***
	(14.39)
Size	-0.0672**
	(-9.19)
Leverage	-0.0531**
	(-10.95)
Goodwill	0.0988***
	(12.29)
Innovation	0.0789**
	(9.29)
Default risk	-0.00001**
	(-11.84)
constant	6.06
N	193
F	19.32
R^2	0.0801
P-value	0.0001

*p < 0.1; **p < 0.05; ***p < 0.01.

Table 8. IV- GMM Regression Results

$$Goodwill = b0 + b1 \times ESG_{T-1} + b2 \times Size_{T-1} + b3 \times Leverage_{T-1} + b4 \times Age_{T-1} + b5 \times Innovation_{T-1} + b6 \times Default\ risk + e$$

Variables	
ESG	0.0731***
	(11.86)
E	0.0599***
	(12.65)
S	0.0157***
	(11.89)
G	0.0001***
	(13.44)
Size	0.0398***
	(14.96)
Leverage	0.0793**
	(15.97)
Innovation	0.0866**
	(10.95)
Default risk	-0.00001**
	(-10.85)
constant	6.54
N	193
F	17.85
R^2	0.0943
P-value	0.0001

∗p < 0.1; ∗∗p < 0.05; ∗∗∗p < 0.01.