Does CSR Actually Hurt Profitability?

A study on the impact of US firms' corporate social responsibility performance on accounting and market metrics of financial profitability

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Abstract

Researchers have long investigated the relationship between firms' corporate social responsibility (CSR) performance and corporate financial performance (CFP) without reaching a consensus. Several scholars highlight the multiple economic benefits that firms increasing CSR performance can enjoy. Nevertheless, executives are often hesitant when engaging in sustainability-related projects, believing they can distract the firm from its profit maximization objectives and hurt financial performance. Therefore, this research investigates the impact of firms' CSR performance on accounting- and market-based indicators of CFP, both with a short and long time horizon. A sample of 529 US-listed companies is collected for a five-year period and analyzed using fixed-effects regression models. This study adopts four different indicators of CFP: ROA and ROE for accounting performance; CAPM Alpha and Fama-French Five-Factor Alpha, two measures of excess returns, for market performance. What emerges from the findings is that CSR performance positively impacts the CFP of US firms, both in terms of accounting- and market-based CFP. However, this relationship is dependent on both the particular financial indicator used and the time horizon. Further, an additional exploratory analysis highlights how the relationship does not hold for firms in the consumer goods industry. This study's findings provide a modest contribution to the CSR and CFP literature while suggesting a few implications for managers, investors, and governments.

Acknowledgments

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Stockholm, 18th of May 2022

Table of Content

1. Introduction

1.1 Background

In the past two years, two significant crises brought uncertainty to the world's economy. First, the Covid-19 pandemic tested most corporations, highlighting inequalities, mental health issues among workers, supply chain mismanagements, and poor governance. Then, the war in Ukraine underscored the importance for businesses to switch to renewable energy sources and invest in socially relevant causes to avoid backlash from the public. Looming in the background, another crisis is set to bring even more significant disruptions: climate change. Existing commitments from governments to tackle climate change are projected to result in a global temperature increase between 2.7°C and 2.9°C (Varley, 2021). However, "*Global warming, reaching 1.5°C in the near-term, would cause unavoidable increases in multiple climate hazards to ecosystems and humans*", as stated in the UN's Climate Change Report (2022). At COP26, recently held in Glasgow, what emerged is that businesses must play a vital role in tackling climate change (Varley, 2021).

In this context, the terms Corporate Social Responsibility (CSR) and Environmental, Social, and Governance (ESG) are increasingly common among executives, investors, and researchers (Hung, 2021). CSR is a qualitative framework of principles stating that corporations are socially accountable to all stakeholders for their actions. Therefore, firms should be conscious of the impact that their activities have on the well-being of people, the environment, and the economy. ESG is a quantitative framework to measure such impact, and it encompasses the three dimensions. What these crises are highlighting is that environmental, social, and governance issues go hand in hand with each other. For example, elevating communities from poverty is necessary to ensure that they will develop environmentally sustainable practices (Meyer-Ohlendorf, 2009). At the same time, responsible governance is a prerequisite for businesses to appropriately tackle environmental and social issues (S&P Global, 2020). However, one major obstacle hinders businesses' sustainable development: *does engaging in CSR activities hurt firms' financial performance?*

This question is subject to political debate in the United States, the world's second-largest polluter after China (Statista, 2021). Democratic presidents introduce legislation to curb firms' emissions and promote green jobs to stimulate the economy, while Republican presidents

loosen environmental standards to maximize corporate profits (Kolbert, 2020). According to WorldBank, governments and corporations would have to spend a whopping $90 trillion by 2030 to tackle climate change. However, such a significant investment is set to return $4 for every $1 invested (UN, 2021). This debate has attracted researchers investigating the relationship between firms' CSR and corporate financial performance (hereafter CFP). For example, McKinsey's analysts suggest that higher CSR performance can improve accounting KPIs by stimulating top-down growth, reducing costs, optimizing resource utilization, and boosting employee motivation (Henisz et al., 2019). Looking at financial markets, other researchers point out that investors are demanding more information on firms' CSR efforts, from carbon emissions to the effectiveness of diversity and inclusion policies, believing that sustainable firms will provide superior stock returns (Jessop and Murugaboopathy, 2021). In fact, the "Fortune 100 Best Companies to Work for in America" consistently outperformed the S&P 500 Index from 2012 to 2022, as reported by the financial news provider Bloomberg (2022). Further, there is evidence that firms with better environmental, social, and governance standards typically beat their benchmarks (Thomson, 2018).

1.2 Problematization

As mentioned, there is evidence that engaging in CSR activities can benefit firms' financial performance. However, scholars have no consensus regarding the nature and existence of such a relationship. Several authors, among which Orlitzky and colleagues (2003) are the most notable, report a positive relationship between CSR and CFP, stating that engaging in projects beneficial for a company's stakeholders will increase shareholders' value through different channels. Still, others appeal to the high costs of those activities, describing them as value-destroying for shareholders (Hillman and Keim, 2001). Meta-analyses have tried to shed light on this highly debated topic without conclusive results (Busch and Friede, 2018). Another issue in CSR-CFP research is the operationalization of the dependent variable CFP. The CFP literature often highlights how accounting- and market-based measures of financial performance are inherently different (Gentry and Shen, 2020). However, evidence points to a positive relationship between CSR and CFP with both accounting and market-based indicators. Still, while some researchers (Wang and Sarkis, 2017) find a positive or negative CSR-CFP link regardless of the measure used, others (Velte, 2017) find that using market- vs. accounting-based indicators has a moderating effect on the CSR-CFP link. Given the mixed results in this

area of research, this study aims to examine the impact of firms' CSR performance on accounting and market indicators of CFP.

1.3 Research Contributions

This research contributes to the CSR literature in several ways. Firstly, it contributes to the debate around the stakeholder theory (Freeman, 1984), according to which corporations should consider all stakeholder's needs, and the shareholder theory (Friedman, 1962), according to which corporations should just care for shareholders' needs. If increasing CSR performance leads to superior financial profitability, corporations should consider all stakeholders' needs, as it also benefits shareholders.

Secondly, most authors focus on either accounting- or market-based indicators of CFP. This prevents researchers from painting a complete picture of how increasing CSR efforts might impact financial performance. Shareholders' value mainly comes from the appreciation in stock prices and dividends, which is often driven by better accounting results, such as increased earnings or free cash flows. However, sometimes a firm's management is short-sighted, pushing for actions that increase stock prices in the short term but erode earnings in the long term (Rappaport, 2006). Therefore, investing in CSR might produce positive results on both financial statements and stock exchanges or benefit just one of these two dimensions. To examine the interplay between accounting, market metrics, and CSR performance, both measures of financial performance are included in this study. Further, almost all researchers measure market performance with Tobin's Q, a mixed accounting-market indicator. As a market metric, this paper adopts excess returns, which are indicators of how a stock overperformed a given benchmark and delivered superior returns to shareholders.

Thirdly, most studies conducted on the topic investigate the short-term impact that CSR performance has on CFP. However, it can be noted that CSR investments rarely pay off immediately, but rather their impact on firms' financial performance becomes more prominent over time (Nollet et al., 2016; Alareeni and Hamdan, 2020). Consequently, this study examines the impact of CSR performance on CFP both from a short and long time perspective.

Finally, the study only considers firms based in the US. The United States is the world's largest economy by GDP (Statista, 2022). Consequently, trends and events related to this country have echoes all around the globe. Moreover, the US has the world's largest equity market, with its two leading stock market operators, the NYSE and NASDAQ, holding a combined $49.6

trillion in capitalization[1] (Statista, 2022). Despite being one of the most advanced economies globally, the US lags behind the EU in promoting CSR investments (Marsh, 2020). Therefore, it is particularly relevant to focus on the US market for research on the CSR-CFP link, as US firms have the power to influence and drive sustainable development across the globe.

Additionally, this study contributes to the CFP literature by indirectly investigating the interplay between accounting and market measures of financial performance. In particular, this paper draws on Michael Spence's (1973) signaling theory in the context of financial markets, according to which accounting information influences stock prices, and the efficient market hypothesis (Fama, 1970), according to which stock prices incorporate all available information in the market, including accounting and CSR information.

1.4 Purpose

All firms should prioritize CSR issues to tackle current and future challenges that undermine the health of People and the Planet. However, when firms' management and shareholders decide on CSR projects, it often comes down to the third P: Profits. Therefore, this paper aims to answer the following research question:

What is the impact of CSR performance on the CFP of US-listed firms? Is this impact equal or different when CFP is operationalized using accounting-based indicators compared to market-based indicators?

The study contributes to the CSR literature, particularly to the debate concerning the validity of the stakeholder theory. Further, it contributes to the CFP literature by indirectly observing the relationship between accounting and market data, drawing on the signaling theory and the efficient market hypothesis. Data on 529 US-listed firms is collected over a five-year period and analyzed using fixed-effect regression models to answer the research question. Notably, the dependent variable CFP is regressed over the independent variable CSR performance to observe if a change in firms' CSR performance leads to a change in CFP. Four different indicators of CFP are adopted: ROA and ROE for accounting performance; CAPM Alpha and Fama-French Five-Factor Alpha, two measures of excess returns, for market performance. The relationship is examined in both the short and long term.

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[1] For reference, this is well above the third largest stock market operator, the Shanghai Stock Exchange, holding 7.3 trillion dollars in capitalization (Statista, 2022).

2. Theory Development

This section reports previous research and relevant theories on the relationship between CSR and CFP and the interplay between accounting- and market-based measures of CFP, leading to the development of this study's hypotheses.

2.1 The Relationship between CSR and CFP

The relationship between CSR and CFP has been widely researched ever since the 1970' (Toro, 2007) and is still highly debated in academia (Wang et al., 2016). The debate revolves around two contrasting normative theories that dictate the role a company should play in society: the shareholder and the stakeholder theories (Smith, 2003). The most traditional view of the societal goal of a company, the shareholder theory, was first proposed by Milton Friedman (1962). It posits that the only purpose of a corporation is to maximize profits to benefit its capital providers (i.e., the shareholders). For this reason, a company operating under the shareholder theory will only be interested in investing in those activities that are forecasted to be profitable in monetary terms. Drawing on the shareholder theory, some scholars argue that CSR initiatives do not pay off as they can be costly (Barnett and Salomon, 2006) and distract firms from growing their core operations (Hull and Rothenberg, 2008), resulting in a loss of their competitive advantage (Klassen and Whybark, 1999). Hillman and Keim (2001) claim that engaging in activities that benefit stakeholders may erode shareholders' value.

A contrasting perspective was advanced by Freeman (1984) with the stakeholder theory, which claims that the managers of a company have the duty to act in the interest of all those parties that affect or are affected by the enterprise's activities (Yang et al., 2019), and not only the shareholders. The term "stakeholders" encompasses shareholders, customers, employees, suppliers, and the local communities (Beauchamp and Bowie, 1988), and the joint pressure of these actors can affect corporate decisions on the implementation of CSR practices (Surroca et al., 2010). Moreover, responding to stakeholders' concerns is especially important to secure a competitive advantage in the market (Crilly et al., 2012). Remarkably, investing in social or environmental causes can result in increased loyalty, satisfaction, and willingness to pay from customers (Bagnoli and Watts, 2003; Galbreath and Shum, 2012), more robust relationship with suppliers (Cavaco and Crifo, 2014), better reputation (Aouadi and Marsat, 2018; Zumente and Bistrova, 2021), or employee satisfaction (Cavaco and Crifo, 2014; Zumente and Bistrova,

2021). This explains why a company would like to engage in CSR activities to improve all stakeholders' well-being (Brammer and Millington, 2008).

To prove the stakeholder theory's validity, researchers have tried to demonstrate that engaging in CSR activities, which benefit all stakeholders, is related to superior financial profitability, which ultimately benefits shareholders. The studies conducted on the topic during the 1990' were mixed and inconclusive (Orlitzky et al., 2003), to the point that some authors called for a moratorium of research on the relationship between CSR and CFP (Margolis and Walsh, 2001; Rowley and Berman, 2000). In the coming years, several meta-analyses have tried to shed light on this controversial matter, concluding that CSR performance has an overall positive effect on financial profitability (Busch and Friede, 2018). Whelan and colleagues (2021) conducted a meta-analysis of research published between 2015-2020, finding that 58% of studies report a positive CSR-CFP relationship, 13% neutral, 21% mixed results, and only 8% a negative relationship. However, despite these encouraging results, scholars still have no consensus on the CSR-CFP relationship (Barnett, 2007; Busch and Friede, 2018; Huang et al., 2020).

Because of these contradictory findings, CSR research has shifted focus from investigating the existence of a CSR-CFP link to explaining potential moderators of the relationship (Vishwanathan et al., 2020). Wang and Qian (2011) suggest that differences in stakeholders' awareness of firms' CSR efforts might be a moderating factor. Therefore, the relationship might be stronger in developed countries because of modern information channels and greater press freedom (Wang et al., 2016; Aouadi and Marsat, 2018). Industry belonging might also play a part in moderating the relationship (Cho et al., 2019), as does firm size (Drempetic et al., 2019; Kim and Li, 2021). Several authors point to the fact that differences in the operationalization of the concept of CFP might lead to contrasting results. Notably, the correlation between CSR and CFP appears to be different when using accounting-based profitability measures rather than market-based ones (Orlitzky et al., 2003; Wang et al., 2016; Lu, 2016; Qureshi et al., 2021).

2.2 Accounting- and Market-based Measures of CFP

CFP is a key dependent variable in the academic field, as there is often interest in understanding what makes some firms more competitive and profitable than others (Hult et al., 2008). Researchers distinguish between two broad classes of measures of CFP: accounting- and market-based measures. Accounting-based measures are derived from firms' financial

statements. Market-based measures are derived from firms' stock prices in the financial market (Gentry and Shen, 2020). Among researchers, there is an ongoing debate regarding the relationship between these two measures of financial performance. Some studies (Hoskisson et al., 1994; Rowe and Morrow, 1999) report a positive relationship between accounting- and market-based measures, pointing out that they can be used interchangeably to measure financial performance. Nevertheless, other studies (Choi and Wang, 2009; Gentry and Shen, 2020) report a neutral relationship, indicating that accounting and market performance are two separate constructs, and different underlying theories will explain how they are impacted by or their impact on other variables. Some other studies (Ur Rahman et al., 2017) report mixed results.

Several scholars joined the debate to explain why accounting- and market-based measures might represent two separate dimensions of financial performance. Accounting-based measures reflect firms' past performance, as they rely on historical information disclosed by firms in financial statements (Yang et al., 2019). Therefore, they are often regarded as limited in predicting firms' future profitability (Keats, 1988) and fail to incorporate current market trends (Shin-Ping and Tsung-Hsien, 2009). Furthermore, accounting data might be biased by the application of different depreciation or accounting policies, even within the same reporting framework (Ur Rahman et al., 2017). Instead, market-based measures are forward-looking. They reflect current and future profitability and account for intangible assets more effectively than accounting measures (Richard et al., 2009). According to Seth (1990), market and accounting measures are structurally different simply because market values represent the discounted present value of future free cash flow to the firm, while accounting data is historical. Market measures are immune from the manipulations of managerial practices and accounting standards (Rowe and Morrow, 1999). However, market values are highly dependent on the information flow between firms and investors (Richard et al., 2009) and are biased by investors' behaviors and perceptions (Thaler, 2005; Hoffmann and Pennings, 2013).

Despite the differences between accounting- and market-based measures, researchers still agree that there is a connection between the two (Gentry and Shen, 2020). Past performance can be a good predictor of future performance (Hoskisson et al., 1994), and accounting disclosure influences stock prices by affecting investors' behavior and risk perceptions (Linciano et al., 2018). This is often called signaling theory, as accounting data signals critical information to investors (Ur Rahman et al., 2017). In fact, firms reporting stellar earnings in their periodic reports often attract more investors, boosting their stock prices, just like firms that miss their

earning targets often see their shares free falling in stock exchanges. Further, according to the efficient market hypothesis (Fama, 1970), stock prices instantly incorporate all available information in the market, reflecting firms' fundamental value. Therefore, accounting information will influence market performance, being immediately incorporated into firms' share prices. This also entails that information on the CSR performance of a company will impact investors' expectations of the company's future value.

2.3 The Impact of CSR Performance on Accounting- and Market-based Measures of CFP

Companies are diminishing their carbon footprint and investigating sustainable solutions to conduct their businesses faster than ever (Eccles and Klimenko, 2019). In this context, firms' stakeholders are playing a crucial role, pushing companies for a change towards sustainability: government authorities are introducing legislation requiring firms to reach emission targets (Henisz et al., 2019); investors and financial institutions are shifting to green investments (Bernow, 2017); employees are looking for firms with a social mission (Aziz, 2020); consumers often boycott irresponsible firms, demanding more commitment in safeguarding people and the planet (Henisz et al., 2019). Therefore, drawing on the stakeholder theory, companies are starting to realize the financial value that CSR can bring to their businesses. Despite some arguments that engaging in activities beneficial for stakeholders might deteriorate shareholders' value (Hillman and Keim, 2001), there is evidence that CSR investments generate superior financial performance, considering both market- and accounting-based indicators.

Dissatisfied by outdated negative screening strategies, investors are increasingly looking at green investments for diversification and risk management purposes (Whelan et al., 2021). Also speculators, in search of future gains, are attracted to firms with high CSR performance, lured by the belief that they will have more robust financial performance over time (Jessop and Murugaboopathy, 2021). Further, most US investors would sacrifice their portfolio performance to address CSR issues, at least in the short term (Pwc, 2022). These factors, all together, contribute to the appreciation in stock prices of high CSR performing firms. CSR activities can also bring direct benefits to firms' financial statements. For example, businesses can cut costs by removing waste in the supply chain (Cherel-Bonnemaison et al., 2021), increasing energy efficiency (Nurunnabi et al., 2019), and avoiding government fees for non-

compliance with social or environmental standards (Henisz et al., 2019). In addition, credit institutions increasingly integrate CSR metrics into lending decisions (Kim and Li, 2021). This means that sustainable firms will be awarded higher credit ratings (Kim and Li, 2021) and will be able to borrow at a lower cost of debt (Eliwa et al., 2021), reducing interest expenses. Further, firms can stimulate top-line growth by attracting more consumers (Galbreath and Shum, 2012), retaining a productive and motivated workforce (Whelan et al., 2021), developing innovations (Majda et al., 2020), and more strategically allocating their resources (Ramanathan, 2018). These factors, all together, boost the accounting key ratios of high CSR performing firms.

A few researchers investigate the impact of CSR performance on both accounting and market CFP. For example, Velte (2017) and Yang and colleagues (2019) find a positive relationship between CSR and CFP with accounting data and a neutral relationship with market measures. On the contrary, Qureshi and colleagues (2021) find a positive relationship with market data and a neutral relationship with accounting measures, suggesting that even if socially responsible activities are costly accounting-wise, they can attract investors and boost stock prices. However, other authors (Nollet et al., 2016; Hussain et al., 2018; Rodríguez-Fernández et al., 2019; Naimy et al., 2021) find no overall relationship between CSR and CFP with either accounting or market indicators, while some researchers (Wang and Sarkis, 2017; Cho et al., 2019; Alareeni and Hamdan, 2020; Kim and Li, 2021) find a significant positive CSR-CFP link with both indicators. In sum, the research conducted on the topic is incomplete, and there is no consensus among scholars (see Section 2.4 "Summary of Relevant Literature Reviewed" for a summary table).

As mentioned, accounting and market indicators of financial performance, despite being connected, are distinct and impacted by different factors. However, regarding their link to CSR performance, these factors point towards a positive relationship for both measures. Notably, numerous studies find a positive and significant relationship between CSR and CFP when measured with either accounting or market data (Whelan et al., 2021). Therefore, this study tests the hypotheses that CSR performance has a significant positive impact on accounting financial performance and market financial performance:

H1: CSR performance has a significant positive impact on accounting CFP

H2: CSR performance has a significant positive impact on market CFP

Firms investing in CSR often navigate unknown territories, as it is challenging to quantify returns given the long time horizon associated with these investments (Broughton and Maurer, 2021). Nollet et al. (2016) and Alareeni and Hamdan (2020) argue that CSR expenditures do not pay off immediately, indicating that their positive impact on financial statements becomes more prominent over time. At the same time, CSR investors are increasingly adopting a long time horizon in their portfolio decision, given that sustainability factors influence market values especially in the long term (Orsagh, 2019). In general, it takes time for businesses to maximize their investments and for investors to fully grasp their potential, which suggests a positive relationship between firms' investments and financial performance in the long run (Hall et al., 2012). This might especially be true in the context of CSR, as a metastudy by Hang et al. (2019) found that environmentally sustainable investments impact financial performance particularly in the long run.

Whelan and colleagues (2021)'s meta-model suggests that CSR-CFP studies adopting a long-term focus are 76% more likely to obtain positive or neutral results, while Van de Velde and colleagues (2005) suggest that CSR performance has a positive impact on CFP in the long run. Accordingly, this study tests the hypothesis that with a long time horizon, the effect of CSR performance on both accounting and market profitability is positive:

H3: CSR performance has a significant positive impact on accounting CFP, considering a long time horizon

H4: CSR performance has a significant positive impact on market CFP, considering a long time horizon

2.4 Summary of Relevant Literature Reviewed

See the table below for a summary of the key research papers reviewed on the CSR-CFP link with accounting- and market-based measures.

Authors	Country	Sample Year	n of firms	Industry	CSR data source	Accounting data	Market data	Significant findings
Rodríguez-Fernández et al. (2019)	Europe, North America, East Asia, Australia	2017	210	Tourism industry (Travel and leisure)	ESG Scores (Thomson Reuters database)	ROA ROE	Tobin's Q	ESG has no impact on any variable
Velte (2017)	Germany	2011-2015	83	Non-financial companies from all industries	ESG Scores (Thomson Reuters database)	ROA	Tobin's Q	ESG positively impacts ROA and does not impact Tobin's Q
Alareeni & Hamdan (2020)	United States	2009-2018	505	All industries	ESG Scores (Bloomberg)	ROA ROE	Tobin's Q	ESG positively impacts all variables
Cho et al. (2019)	South Korea	2015-2016	191	Non-financial companies from all industries	CSR scores (Korea Economic Justice Institute)	ROA	Tobin's Q	CSR positively impacts all variables
Qureshi et al. (2021)	United States	2009-2018	100	All industries	ESG Scores (3BL Media)	ROA ROE	Tobin's Q Market-to-book ratio (MTB)	ESG positively impacts Tobin's Q and MTB and does not impact ROA and ROE
Kim & Li (2021)	United States	1991-2013	4708	All industries	ESG Scores (MSCI ESG Stats database)	ROA	Credit ratings	ESG positively impacts all variables
Yang et al. (2019)	China	2010-2016	125	Pharmaceutical industry	CSR scores (Hexun rating system)	ROA ROE Earnings per share	Tobin's Q	CSR positively impacts ROA, ROE, and EPS and negatively impacts Tobin's Q
Wang & Sarkis (2017)	United States	2009-2013	423	All industries	ESG Scores (Bloomberg)	ROA	Tobin's Q	ESG positively impacts all variables
Hussain et al. (2018)	United States	2007-2011	44	All industries	ESG Scores (Bloomberg)	ROA ROE	Tobin's Q	ESG has no impact on any variable
Nollet et al. (2016)	United States	2007-2011	505	All industries	ESG Scores (Bloomberg)	ROA ROE	Excess stock returns	Linearly, ESG does not impact any variable
Naimy et al. (2021)	East Asia	2011-2017	108	Capital good, Services, and Transportation industry	ESG Scores (Thomson Reuters database)	ROA ROE	Stock returns MTB	Linearly, ESG does not impact any variable

Table 1: Summary of Relevant Literature Reviewed

3. Methodology

This section describes the research design, the rationale behind the selection of the most appropriate regression model, and details regarding the robustness of the model utilized. Further, additional research considerations are presented.

3.1 Research Design

This study strives to investigate whether changes in CSR performance cause any change in the CFP of the observed companies and whether the effect is equivalent when CFP is estimated with accounting- as opposed to market-based measures. This phenomenon is examined using both a short and long time horizon. In the former case, CSR performance data is taken with one year of lag compared to CFP data. In the case of the longer time horizon, CSR data is lagged by three years.

When assessing companies in research, scholars criticize the use of single indicators to measure certain concepts such as financial performance (Boyd et al., 2005). For this reason, in this study, CFP is gauged using two financial performance measures based on accounting and two based on the stock market, for a total of four CFP indicators. On the accounting side, such measures are Return on Assets (ROA) and Return on Equity (ROE), whereas Fama-French Five Factors Alpha and CAPM Alpha (measures of excess returns) cover the stock market side. Meanwhile, like most papers in this area of research, companies' CSR performance is evaluated through ESG Scores.

To test the study hypotheses, fixed-effects panel data regression models are estimated.

3.2 Regression Model Choice

The study is conducted utilizing regression analysis, which allows to "*ascertain the causal effect of one variable* [the independent variable] *upon another* [the dependent variable]" (Sykes, 1993). In this case, the independent or explanatory variable is CSR performance, and the dependent or explained variable is CFP. There are several regression models, and the simplest form is called linear regression. This regression type tries to fit a straight line that minimizes the discrepancies between the variables.

Linear regression model:

$$y_i = \beta x_i + \alpha + u_i \quad , \quad for \; i = 1, 2, \ldots, N \tag{1}$$

Where:

- y_i is the dependent variable
- β is the slope coefficient
- x_i is the independent variable
- α is the intercept
- u_i is the random or idiosyncratic error term

However, a linear regression model is too simple to examine the relationship between CSR performance and CFP without producing biased results that stem from the influence of other variables. In fact, there may be numerous unobserved variables that correlate with the dependent (financial performance) and independent variables (CSR performance). For instance, firms operating in an exceptionally profitable industry or with a specifically profitable business model might also have high CSR scores. In this instance, changes in firms' CFP would be explained by industry belonging and business model rather than CSR performance. This is precisely what unobserved heterogeneity is – an instance where one can expect unobserved variables to correlate with observed ones (Arellano, 2003). A direct consequence of unobserved heterogeneity is endogeneity, which occurs when an observed independent variable is correlated with the error term that captures unobserved independent variables (Wooldridge, 2009). Unobserved heterogeneity and endogeneity are two critical issues in econometrics (Brugger, 2021), and they preclude the use of traditional linear regression models. Indeed, a simple OLS (Ordinary Least Square) regression would be far too inefficient and biased since it would not account for such unobserved variables, producing misleading estimates and making statistical inferences erroneous (Beck and Katz 1995; Greene 2012; Hanck et al., 2019).

Considering these issues and the nature of the data, the best way to approach this research is to examine the impact of changes in CSR performance on CFP across time through panel data regressions. Indeed, one of the main advantages of panel data regressions is that they can control for those firm-specific variables that are impossible to observe or measure (Torres-Reyna, 2007) and that may generate biased estimators in linear regression models, as aforementioned. In other words, panel data account for individual heterogeneity (Brugger, 2021). There are three major panel data regression versions: the pooled OLS (Ordinary Least Square) model, the fixed-effects model, and the random-effects model (Alam, 2020).

Nonetheless, fixed effects and random effects are the two dominant approaches in research (Clark and Linzer, 2015) because a pooled OLS is mainly similar to a simple OLS, as it ignores time and individual characteristics (Alam, 2020; Brugger, 2021). Moreover, Wooldridge (2010) holds that pooled OLS models ought to be applied when a different sample of entities is collected per each period. In contrast, in the case of this study, the same sample of companies is observed over the years. For this reason, the pooled OLS can be ruled out as a plausible model for this analysis, leaving fixed and random effects as the only suitable models.

Fixed effects models observe the relationship between dependent and independent variables within each entity (*i*), a company in this case. They examine the impact of changes in CSR performance on CFP not across firms (inter-company variation) but within firms (intra-company variation) across time. More specifically, fixed effects control for the time-invariant characteristics of each company to remove their bias when explaining the effect between predictor and outcome variables (Torres-Reyna, 2007; Allison, 2009). In other words, obtaining multiple observations for each firm (one for each year) and looking at the relationship between CSR and CFP *within* each entity *across* years removes the problems arising from omitted variable bias on the dependent variable (Stock and Watson, 2003). The biggest drawback of fixed effects models is that they can only observe dependencies within entities. Furthermore, for fixed-effect models to be reliable, one must assume that all unobserved variables are time-invariant (Torres-Reyna, 2007). Therefore, industry belonging, firm-specific business model, and other factors potentially influencing observed variables would be assumed not to vary over time.

Fixed effects model:

$$y_{it} = \beta x_{it} + \alpha_i + u_{it} \quad , \quad for \ i = 1,2,\ldots,N; \ t = 1,2,\ldots,T. \tag{2}$$

Where:

- y_{it} is the dependent variable
- β is the slope coefficient
- x_{it} is the independent variable
- α_i is the intercept capturing individual effects
- u_{it} is the random or idiosyncratic error term

The primary assumption behind fixed effects models is that the time-invariant unobserved characteristics of each entity (the company-specific effects) correlate with the independent variables (Torres-Reyna, 2007). This can be expressed as:

$$Cov(x_{it}, \alpha_i) \neq 0 \tag{3}$$

Unlike fixed effects, random effects models assume that the across-entity variance – the unobserved individual heterogeneity – is random and not correlated with the explanatory variable (Wooldridge, 2003; Wooldridge, 2010). This makes it possible for time-invariant variables to be predictor variables and thus influence the dependent variable (Torres-Reyna, 2007). However, this is also the downside of random-effects models since all the individual characteristics that may influence the regression should be manually included and controlled, unlike fixed-effects models. A significant advantage of random effects models is that they can shift between pooled OLS and fixed effects, catching both within and between effects among entities (Brugger, 2021).

Random effects model:

$$y_{it} = \beta x_{it} + \alpha_i + u_{it} \quad , \quad for\ i = 1,2,\ldots,N;\ t = 1,2,\ldots,T. \tag{4}$$

Assuming that the unobserved heterogeneity captured by α_i (i.e., individual-specific effects) is not correlated with the independent variables (Wooldridge, 2003):

$$Cov(x_{it}, \alpha_i) = 0 \tag{5}$$

When using panel data, the best and most commonly used statistical method to compare and choose between fixed effects and random effects models is the Hausman test (1978). The test checks whether the unique errors correlate with the independent variable, the null hypothesis being that they do not (Torres-Reyna, 2007). In other words, the test's null hypothesis is that random effects is the most appropriate model (Greene, 2010). More specifically, if the unique errors are not correlated with the regressor, the biases in the random-effects model are small enough to ignore (Allison, 2009).

The Hausman test formula:

$$H = (\hat{\beta}_{RE} - \hat{\beta}_{FE})'[Var(\hat{\beta}_{RE}) - Var(\hat{\beta}_{FE})]^{-1}(\hat{\beta}_{RE} - \hat{\beta}_{FE}) \tag{6}$$

Where:

- $\hat{\beta}_{RE}$ is the random effects estimator

- $\hat{\beta}_{FE}$ is the fixed effects estimator

The Hausman test has been performed on all eight baseline models, one per each financial performance measure and for both the short and long time horizons. The null hypothesis could be rejected at the 1% significance level for all models, meaning that the fixed effects regression model is preferred over the random effects one. This comes as no surprise considering that some individual time-invariant variables can impact the dependent variable (CFP performance), and they need to be controlled with a fixed-effects model.

3.3 Regression Model

The study is conducted with a fixed-effects panel data regression over five years for each of the eight models. Additionally, the final model includes several control variables that vary over time (and thus cannot be captured by the fixed-effect model) and are believed to affect the financial performance of companies. The specific control variables are described in Section 4.2.4 "Control Variables". The ultimate model looks as follows:

$$CFP_{it} = \beta_1 CSRPerformance_{it} + \beta_2 ControlVariables_{it} + \alpha_i + u_{it} \ ,$$

$$for \ i = 1,2,\ldots,N; t = 1,2,\ldots,T. \tag{7}$$

Where:

- CFP_{it} is the dependent variable as measured by ROA, ROE, Fama-French Five Factors Alpha, and CAPM Alpha
- β_1 is the slope coefficient for the CSR performance variable
- $CSRPerformance_{it}$ is an independent variable measured by ESG Scores
- β_2 is the slope coefficient for the control variables
- $ControlVariables_{it}$ are independent variables
- α_i is the intercept capturing individual effects
- u_{it} is the random or idiosyncratic error term

Appendix 1 reports a visual example of how the fixed-effects regression model investigates the relationship between CSR performance and CFP (particularly using ROA), using Amazon.com (AMZN) as a sample firm.

3.4 Model Robustness and Validity

3.4.1 Multicollinearity

Multicollinearity is a statistical phenomenon that occurs when two or more predictor variables in a multiple regression model are intercorrelated (Farrar and Glauber, 1967). Its occurrence constitutes a threat to the proper and correct estimation of the regression coefficients (Gujarati, 2009). In particular, multicollinearity inflates the standard errors of the coefficient estimates, making them less reliable, and causing inferences about the results and their significance to be inaccurate (Kalnins, 2018). As will be highlighted by the correlation matrix in Section 4.3 "Descriptive Statistics", there is only one instance where the independent variable, ESG Score, moderately correlates with a control variable of this study, firm size (correlation coefficient of 0.419 and 0.416), signaling a possible issue with multicollinearity. However, Franke (2010) holds that multicollinearity occurs for correlation coefficients above 0.8. To detect this problem with more accuracy, researchers often go beyond the superficial interpretation of a correlation matrix, resorting to the Variance Inflation Factors (VIF), a more specific measure of the amount of multicollinearity in regression models (O'brien, 2007). However, since multicollinearity is only observed among independent variables and panel data already control for individual effects, the multicollinearity issue is substantially reduced (Hsiao, 2007).

3.4.2 Heteroskedasticity

Another issue affecting regression models is heteroskedasticity, which arises when the residual errors of a variable are not constant over time, and the error variance differs systematically across the entities in the model (Kaufman, 2013; Cantinotti et al., 2016). As most of the issues related to regressions, the presence of heteroskedasticity would lead to distorted results in the model. Unlike multicollinearity, neither panel data nor fixed-effects models can solve the problem of heteroskedasticity, so its detection and correction are necessary to avoid erroneous inferences about the model's outputs. The most widely employed test to discover heteroskedasticity is the Breusch-Pagan test, named after two leading researchers in the field (Breusch and Pagan, 1979). The null hypothesis of the test is that the data is homoskedastic, that is, residuals are equally distributed across individuals. In the case of our study, this null hypothesis could be rejected at the 1% significance level for all models, implying that heteroskedasticity is present.

The most accredited way of solving the heteroskedasticity problem is resorting to what scholars call heteroskedasticity-consistent (or robust) standard errors (Eiker, 1967; Kaufman, 2013). Such errors differ from the classical standard errors in that they reduce the variance that causes heteroskedasticity, resulting in a more reliable model (White, 1980). In practical terms, robust standard errors are generally higher than the classical ones, implying that the significance of the results will be lower, leading to a more conservative model (Croux et al., 2004). For these reasons, all the regression models are run with robust standard errors. Finally, the mere fact that the dependent variables are expressed in percentage means that their values fluctuate less, so the variance that causes heteroskedasticity is reduced.

3.4.3 Autocorrelation

Similar to heteroskedasticity is autocorrelation (often referred to as serial correlation), a statistical term used to describe the degree of correlation between a variable and its lagged version over periods of time (Drukker, 2003). The consequence of autocorrelation is that standard errors are biased, causing the model to be inefficient. Torres-Reyna (2007) and Baltagi (2008) hold that autocorrelation becomes a problem only for the so-called "macro panels", that is, panel datasets with long time series (typically more than 20 years). This is reasonable since more years means more observations for each variable, implying a higher chance of each observation correlating with the following ones. In this study, the panel comprises only five years, meaning that autocorrelation should not be an issue. However, as a precautionary measure to ensure that autocorrelation is not present, the test developed by Wooldridge (2002) was run on all the models, finding no serial correlation issues.

3.4.4 Endogeneity

The last problem to address is endogeneity. There are two leading causes of endogeneity: omitted variables and simultaneity biases (Binstock et al., 2011). The former occurs when essential variables are omitted from the model; the latter refers to reverse causality, where the dependent variable is not merely a response but also a predictor of the independent variable. Bradley and Green (2020) warn that the presence of endogeneity requires any significant relationship between dependent and independent variables to be interpreted as correlations rather than causations. However, this study decreases the bias that endogeneity may cause. First, the fixed effects model allows to control for those omitted variables that are constant over time, and that may affect the accuracy of the model (Qian, 2014), thus tackling the first bias.

Additionally, the time lags between CSR and CFP data points address the simultaneity bias, decreasing the possibility of reverse causality (Leszczensky and Wolbring, 2019).

3.5 Additional Research Considerations

As will be explained in Section 4.1 "Data Collection and Sample Composition" of this paper, the sample consists of US-based firms belonging to several industries. On the one hand, focusing on one country makes the study's findings more easily interpretable and applicable, as the relationship between ESG Scores and profitability might depend on the region considered (Borovkova and Wu, 2020). On the other hand, considering multiple industries limits the applications of the study, as the relationship between ESG Scores and profitability might also depend on the industry considered (Khoury et al., 2021). However, given the limited availability of CSR data, including multiple industries is needed to have a consistent number of observations and provide the regression models with higher explanatory power (Hayat, 2010). Including industry as a dummy variable would enable the model to examine the CSR-CFP link in two different industries (e.g., manufacturing vs. services). Nevertheless, being industry a time-invariant characteristic for all firms, the fixed effects model already controls for its influence on the study variables. Consequently, the dummy variable would be disregarded and rejected by the model.

Therefore, the study first investigates the link between CSR and CFP by considering multiple industries. Then, in Section 5.2 "Additional Exploratory Analysis", a further analysis is carried out, where a potential industry effect is investigated by considering a subset of the sample, only including firms belonging to the consumer goods industry. The case of consumer goods firms is particularly interesting, as customer satisfaction, a potential mediator of the link between CSR and CFP (Galbreath and Shum, 2012), is key in the industry. Each firm in the sample was assigned an industry based on the TRBC sector classification from Thomson Reuters' Refinitiv, a comprehensive and up-to-date industry classification system covering over 250,000 firms (Refinitiv, 2022). Consumer goods firms were defined as those belonging to the "Consumer Cyclical" industry, where firms are heavily impacted by economic fluctuations and business cycles, and the "Consumer non-cyclical" industry, where firms are more resistant to economic downturns, offering staple or essential products to consumers.

4. Data Exploration

In close connection to Section 3 "Methodology", this section describes the data collection process, the sample composition, and the main qualitative and quantitative characteristics of the study variables.

4.1 Data Collection and Sample Composition

All the CSR and financial data used in the study were retrieved from the Thomson Reuters Refinitiv Eikon database, a trusted financial analysis platform with over 400,000 users worldwide, covering 99% of the global market cap (Refinitiv, 2022). The only exception is market performance variables, where fundamental factors underlying their calculation were collected from Kenneth R. French's own online data library (see Section 4.2.3 "Market Performance"). The financial data used to calculate the control variables and CFP was collected for the 2015-2019 period. The CSR data was collected for the 2014-2018 period for the first regression model, where CSR performance is lagged one year compared to CFP. For the second model with three years of lag, CSR data was collected for the 2012-2016 period. The most recent financial year considered in the study is 2019 to avoid potential biases caused by the impact of the Covid-19 pandemic on the CSR and CFP of firms.

The sample initially included all US-based listed companies available on the Thomson Reuters database, for a total of 12,263 firms. Consequently, the data was cleaned from missing values on all variables to ensure that the panel is balanced, meaning that for each year all observations are available for all firms (Kerstens and Van de Woestyne, 2014). The final sample consists of 529 firms headquartered in the US belonging to ten different industries, as defined by the TRBC sector classification (see table below). Considering that, for each firm, the data was collected for five years, this sums up to 2645 observations. A sample of 529 firms is relatively small, though in line with other studies in this field (Beck et al., 2018).

Industry	Basic material	Consumer cyclical	Consumer non-cyclical	Energy	Financial	Healthcare	Industrials	Real estate	Technology	Utilities
N	40	100	39	28	48	50	75	43	77	29
% of total	7.5%	18.9%	7.4%	5.3%	9.1%	9.5%	14.2%	8.1%	14.5%	5.5%

Table 2: Sample Composition

4.2 Variable Specifications

4.2.1 CSR Performance

In the study, CSR performance is measured using ESG Scores from the Thomson Reuters' Refinitiv Eikon ESG database, which includes CSR data for companies accounting for nearly 80% of the global market cap (Refinitiv, 2021). Prior authors (Velte, 2017; Rodríguez-Fernández et al., 2019; La Torre et al., 2021; Naimy et al., 2021) have used Thomson Reuters' ESG Scores to investigate the CSR-CFP link.

ESG Scores measure the performance and commitment of companies on three main sustainability pillars: the environmental pillar (E), measuring firms' efforts in tackling climate change; the social pillar (S), encompassing their treatment of employees, customers, suppliers, and issues such as diversity; and the governance (G) pillar, examining firms' management, internal system of practices and shareholder rights (Henisz et al., 2019). Ten granular categories underpin the three ESG pillars (see the table below).

ESG Score									
Environmental Pillar			Social Pillar				Governance Pillar		
Resource use	Emission	Innovation	Workforce	Human rights	Community	Product responsibility	Management	Shareholders	CSR strategy

Table 3: ESG Score Composition

The scores are calculated based on public information disclosed by companies, which might generate doubts regarding the reliability of the data. One might think that not all companies have the ability to disclose data on all measures, while some companies might refrain from doing so on purpose. To cope with this transparency bias, the data is weighted so that not reporting material information negatively impacts a company's score, while not reporting immaterial information does not.

For each industry, the database provider gathers 186 company-level ESG measures from a pool of over 500 measures to ensure only relevant dimensions are considered in calculating the scores for each company in a particular industry. Then, using a percentile ranking system, firms get a score on each measure based on their position relative to other firms in the same industry (for scores within the E and S pillar) or in the same country (for scores within the G pillar). These scores are then summed up to obtain the ten granular ESG categories. Finally, industry-

specific category weights indicate to what extent each category influences the overall ESG Score for a firm. The final score ranges from 0 to 100, where firms scoring 75-100 are considered ESG leaders and 0-25 ESG laggards.

The percentile ranking system at the heart of the ESG Scores' calculation makes ESG Scores comparable when considering firms belonging to the same country and industry. Even though this research considers multiple industries, the fixed effects regression models only observe whether the within-individual changes in CSR performance cause a change in the company's CFP (Torres-Reyna, 2007). Therefore, the regression only studies changes on a per-entity basis without being impacted by the percentile ranking.

4.2.2 Accounting Performance

As previously mentioned, the financial performance of companies from the accounting side is measured by Return on Assets (ROA) and Return on Equity (ROE). In the context of this study, ROA and ROE are some of the most interesting and effective measures to assess the accounting performance of companies, as previous studies found a relationship between ESG and these returns (De Lucia et al. 2020). The Return on Assets (ROA) indicates how profitable a company is relative to its total assets and how efficiently it deploys its resources (Pointer and Khoi, 2019). ROA can be computed by dividing a company's net income by the average of opening and closing balances of its total assets.

$$ROA = \frac{Net\ Income}{Average\ of\ Total\ Assets} \tag{8}$$

The Return on Equity (ROE) gauges the efficiency of a company in generating profits utilizing its equity (Fernando, 2021). It can be calculated as the ratio of a company's net income and shareholders' equity.

$$ROE = \frac{Net\ Income}{Shareholders'\ Equity} \tag{9}$$

Both ROA and ROE assess a company's capability to generate earnings (net income) from investments, but they should not be considered interchangeable (Pointer and Khoi, 2019). Indeed, despite both being measures of accounting performance, they capture quite different financial aspects of a firm, and they are impacted by distinct elements of the financial statements (Wang et al., 2020). For instance, if a firm were to issue more debt, ROE would

change while ROA would be left untouched (Qureshi et al., 2021). This is especially relevant considering the need to use multiple performance measures, as research suggests (Boyd et al., 2005; Hult et al., 2008).

4.2.3 Market Performance

In most studies investigating the impact of CSR performance on CFP, Tobin's Q is used to measure market performance. Tobin's Q is often approximated as the ratio of a firm's market value of assets to the book value of assets (Chung and Pruitt, 1994). Therefore, it can be considered a mixed accounting-market measure (Richard et al., 2009). This study steers in a different direction, adopting full market indicators for financial performance: excess returns (i.e., abnormal returns). A few authors (Nollet et al., 2016; Landi and Sciarelli, 2019; La Torre et al., 2020) adopt excess returns studying the relationship between CSR and CFP. Excess returns are stock returns achieved above a designated benchmark (Chen, 2021). In this study, two different benchmarks are considered: expected returns as predicted by the Capital Asset Pricing Model and Fama-French Five-Factor Model.

The Capital Asset Pricing Model (CAPM), developed in the early 1960s, describes the relationship between a stock's systematic risk and its expected return (Perold, 2004). Notably, it holds that a stock's expected return is equal to the risk-free rate plus the market risk premium (i.e., the expected return of the market above the risk-free rate) scaled by a stock's market beta factor. Market Beta is a measure of systematic risk, which is considered non-diversifiable and tied to the broader market. More specifically, it measures how a stock price moves relative to the market (Hillman and Keim 2001; Surroca et al. 2010).

$$ER_{i,t} = R_{ft} + \beta_{i,MKT}(ER_{m,t} - R_{ft}) + \varepsilon_{it} \quad , \quad for\ i = 1,2,\ldots,N; t = 1,2,\ldots,T \quad (10)$$

Where:
- $ER_{i,t}$ is an individual stock or portfolio expected return
- R_{ft} is the risk-free rate
- $\beta_{i,MKT}$ is the market beta factor
- $ER_{m,t}$ is the market expected return
- $ER_{m,t} - R_{ft}$ is the market risk premium
- ε_{it} is the random or idiosyncratic error term

A stock's excess return above what the CAPM predicts is called CAPM Alpha. CAPM Alpha is a measure of performance, and it compares a stock's realized return to its expected return given its market risk (Berk and DeMarzo, 2011). The higher the Alpha, the better the performance of the stock. Following CAPM, a stock's realized return can therefore be written as:

$$R_{i,t} = R_{ft} + \beta_{i,MKT}(ER_{m,t} - R_{ft}) + \alpha_{CAPM} + \varepsilon_{it}, \quad for\ i = 1,2,\ldots,N; t = 1,2,\ldots,T \quad (11)$$

Where:

- $R_{i,t}$ is an individual stock or portfolio realized return
- $R_{ft} + \beta_{i,MKT}(ER_{m,t} - R_{ft})$ is an individual stock or portfolio expected return
- α_{CAPM} is CAPM Alpha

Despite still being widely used in research, CAPM has faced much criticism from financial scholars (Rasheed et al., 2016). Remarkably, Fama and French identified the presence of variables that produce non-diversifiable risk in stock returns that are priced separately from market betas and are not captured by the CAPM (Fama and French, 2004). Therefore, the two authors developed a new model expanding on the CAPM, first adding size risk and value risk factors (Fama and French, 1993), and then profitability risk and investment pattern risk factors (Fama and French, 2015) to CAPM's market risk factor. The intuition behind the Fama-French Five-Factor Model is that portfolios containing small-capitalization stocks, high-value stocks, robust-operating-profitability stocks, and stocks with a conservative investment strategy regularly outperform the market (Fama and French, 2015). Following the Fama-French Five-Factor Model, a stock's realized return can be written as:

$$R_{i,t} = R_{ft} + \beta_{i,MKT}(ER_{m,t} - R_{ft}) + \beta_{i,SMB}SMB_t + \beta_{i,HML}HML_t + \beta_{i,RMW}RMW_t +$$
$$\beta_{i,CMA}CMA_t + \alpha_{(FF5FM)} + \varepsilon_{it} \quad , \quad for\ i = 1,2,\ldots,N; t = 1,2,\ldots,T$$

(12)

Where:

- $\beta_{i,MKT}(ER_{m,t} - R_{ft})$ is the market risk factor from CAPM, scaled by its beta
- $\beta_{i,SMB}SMB_t$ is the size risk factor (Small minus Big), scaled by its beta
- $\beta_{i,HML}HML_t$ is the value risk factor (High minus Low), scaled by its beta
- $\beta_{i,RMW}RMW_t$ is the profitability risk factor (Robust minus Weak), scaled by its beta

- $\beta_{i,CMA}CMA_t$ is the investment pattern risk factor (Conservative minus Aggressive), scaled by its beta
- $\alpha_{(FF5FM)}$ is Fama-French Five-Factor Model Alpha (hereafter Fama-French Alpha)

Moving the risk-free rate to the left-hand side of formulae (11) and (12), one can easily notice that they represent linear regression equations. In particular, a stock realized return minus the risk-free rate is the dependent variable, the risk factors are the independent variables, the beta factors are the regression coefficients, and Alpha is the intercept. Therefore, to calculate CAPM Alpha and Fama-French Alpha for each firm in the sample, the stocks' realized returns decreased by the risk-free rate were regressed on the market risk factors for CAPM, and on the five risk factors for the Fama-French Five-Factor Model. The intercept of each regression was the Alpha of the stock. The Alphas were first calculated on a monthly basis, meaning that the monthly realized returns (minus the monthly risk-free rates) for an entire year were regressed on the monthly risk factors for an entire year to obtain e.g., 1-month Alpha for 2019. The 1-month Alphas for each stock were then multiplied by 12 to be normalized to yearly Alphas (e.g., 1-year Alpha for 2019).

The monthly realized returns were calculated as Total Stock Returns, including dividend yield:

$$Total\ Stock\ Return = \frac{P_1 - P_0}{P_0} + \frac{D}{P_0} \tag{13}$$

Where:
- P_1 is the share price at the end of the month
- P_0 is the share price at the beginning of the month
- D is the dividend per share received during the month
- $\frac{D}{P_0}$ is the monthly dividend yield

Total Stock Returns were retrieved from the Thomson Reuters Refinitiv Eikon database, while the monthly five risk factors and the 1-month US Treasury Bill return (i.e., a proxy for risk-free rate) were retrieved from Kenneth R. French's own online data library (2022).

4.2.4 Control Variables

As aforementioned, the influence that companies' time-invariant characteristics may have on the observed variables is already restrained through the fixed effects regression model.

However, there are several other firm-specific variables that may change over time and affect both companies' financial performance and the extent to which each company invests in CSR-related projects. All such variables need to be controlled for and included in the final model. Building on previous literature, this study includes the following control variables: systematic and unsystematic risk, firm size, revenue growth, and price-to-book ratio. All these variables have been collected from the Refinitiv Eikon database.

Firm risk seems to be associated with financial performance (Waddock and Graves, 1997; Godfrey et al., 2009) and engagement in CSR activities (Beck et al., 2018). The total risk faced by a company has two components: systematic and unsystematic (Chang and Guan, 2007). As explained in the previous section, systematic risk can be gauged by the beta factor. On the other hand, unsystematic risk is unique to the company and industry of operation, and it is reflected in the stability of the company's capital structure. For this reason, the most used proxy for unsystematic risk is the ratio of total debt to total assets (Fischer and Sawczyn, 2013; Nelling and Webb, 2009).

The size of a firm is another factor that can significantly influence both its financial performance and the intensity of investments in CSR (Orlitzky, 2001; Wu, 2006). Compared to small enterprises, large firms may be at an advantage due to economies of scale (Velte, 2017), although at the same time they may have pressing stakeholders' expectations concerning their engagement in socially responsible projects (Fischer and Sawczyn, 2013). In this study, firm size is measured by the natural logarithm of total assets (Velte, 2017).

An additional variable to control for is revenue growth, calculated as the percentage change from the previous year. A growing revenue stream generates higher financial returns (Lev et al., 2006) and prompts the need to allocate more capital to investments, thus affecting the implementation of CSR activities (Wang and Sarkis, 2017).

The last control variable included in the study is the so-called price-to-book ratio, which is a company's market value of equity as a percentage of its accounting value of equity (Ercegovac et al., 2020). In practical terms, the price-to-book ratio reflects how much more (or less) investors believe the company is worth in relation to the book value of its equity (Penman, 1996). So, to a certain extent, the price-to-book ratio can be seen as an indicator of investors' expectations.

4. DATA EXPLORATION

4.2.5 Summary of Study Variables

Variable Type	Variable Name	Definition
Dependent variables	ROA	Net income divided by average total assets
	ROE	Net income divided by shareholders' equity
	Fama-French Alpha	Excess return over the expected market return due to the five factors defined by Fama and French
	CAPM Alpha	Excess return over the expected market return as calculated by the one-factor CAPM model
Independent variable	ESG Score	Measure of a company's relative ESG performance
Control variables	Ln Total Assets	Natural logarithm of a company's total assets as a proxy for firm size
	Revenue Growth	Percentage change from previous year's revenue
	Debt-to-Assets	Ratio of total debt to total assets as a proxy for unsystematic risk
	Beta	Measure of a stock's volatility in relation to the market as a proxy for systematic risk
	Price-to-Book	Ratio of the value of market equity to accounting equity

Table 4: Variable Definitions

4.3 Descriptive Statistics

Table 5 displays the summary statistics for all variables employed in the main studies. Looking at ESG Scores, the mean for the one-year lag scenario is more than four points higher than the three-year lag case, indicating that sustainability scores have increased over the years. In the first scenario, the standard deviation around the mean is 18.569, with a minimum value of 1.607 and a maximum value of 93.054, and a mean value (52.658) very close to the median one (53.197), indicating that the data can be assumed to follow a normal distribution. The same goes for the three-year-lag scenario, where the data is slightly more spread out from the mean, as the standard deviation is higher (19.229). Appendix 2 displays the distribution of the companies' ESG Scores for the years 2012 and 2018, showing the clear bell curve of a normal distribution that skews to higher values for the most recent year.

Prior to the regression analysis, a study of the correlation between the research variables is required to get an overall understanding of the underlying relationships between them. Appendix 3 reports the results of the Pearson's correlation analyses, carried out for both lag

scenarios. Most notably, ESG Scores are significantly and positively correlated with both ROA and ROE in either lag cases. This is an early indication that higher ESG Scores may lead to better accounting-based financial performance (Nollet et al., 2016). Additionally, ESG Scores are significantly correlated with firm size and systematic and unsystematic risk, with firm size's correlation coefficient being moderately high (0.419 and 0.416). Nevertheless, this correlation is still low to be considered a sign of multicollinearity in the model. Further, as mentioned in Section 3.4.2 "Multicollinearity", the fixed-effects panel data model significantly counteracts this issue.

Variable	Obs	Mean	Std. Dev.	Min	Max	25th	50th	75th
ROA	2645	0.060	0.071	-0.370	0.533	0.023	0.052	0.090
ROE	2645	0.190	0.362	-5.986	5.031	0.097	0.164	0.261
Fama-French Alpha	2645	-0.003	0.390	-2.818	4.003	-0.199	0.013	0.196
CAPM Alpha	2645	-0.018	0.334	-2.174	2.851	-0.177	0.010	0.165
Ln Total Assets	2645	23.253	1.352	19.391	27.624	22.325	23.127	24.096
Revenue Growth	2645	0.047	0.273	-11.079	2.393	-0.010	0.041	0.099
Debt-to-Assets	2645	0.309	0.201	0.000	2.439	0.177	0.299	0.412
Beta	2645	1.079	0.528	-0.409	3.602	0.734	1.049	1.360
Price-to-Book	2645	3.977	13.727	-235.378	336.970	1.620	2.715	4.772
ESG (*one-year lag*)	2645	52.658	18.569	1.607	93.054	39.048	53.197	67.115
ESG (*three-year lag*)	2645	48.253	19.229	1.607	93.011	33.607	47.562	63.077

Table 5: Descriptives and Variability

5. Results

This section reports the results of the study's main regression models and the outcomes of the additional exploratory analysis conducted on the consumer goods industry.

5.1 Hypotheses Results

This study employs a 0.1 (10%) significance level to reject the null hypotheses, meaning that the confidence interval is 0.90 (90%). The statistical literature does not set clear rules for choosing a particular significance level, but it is rather a convention. So, the decision to employ a 10% significance level has been made given the characteristics of the study sample. With 529 companies over five years, the sample does not yield a large number of observations, and it can thus be considered relatively small. However, the larger the sample size, the smaller the standard errors, and therefore, the smaller the p-values, leading in turn to smaller significance levels (Hayat, 2010). Therefore, since our sample size is small, it will more hardly yield significant results, making a 10% significance level reasonable for this study.

Table 6 outlines the results of the regressions of the sample companies' financial performance on the respective ESG Scores, with one year of lag. From the first model, the impact of ESG Scores on ROA is positive and significant at the 5% level (sig. 0.016). The beta of 0.0005 indicates that for every increase in ESG by one unit, ROA increases by 0.05%. This gets more easily interpretable if one considers the percentile rankings. From the descriptive statistics table, the 25th percentile of ESG (one-year lag) is 39.048, whereas the 75th percentile is 67.115. This means that if a company were to grow its ESG Score from the 25th to the 75th percentile, it would increase its ROA by 1.40%. Moreover, in this model, firm size and unsystematic risk are negatively but significantly related to ROA, meaning that the smaller firms and those with a lower debt-to-assets ratio perform financially better.

The relationship between ESG Scores and Fama-French Alpha is also positive, though more weakly significant, as the significance level is within the 10% threshold (sig. 0.082). In this case, the beta of 0.0021 indicates that increasing one's ESG Scores from the 25th to the 75th percentile leads to a 5.89% increase in the Fama-French Alpha. No control variable influences the financial performance in this model, meaning that ESG Score is the only determinant of market-based financial performance when measured by Fama-French Alpha.

The remaining two models (ROE and CAPM Alpha) are both statistically insignificant, meaning that there is virtually no effect of ESG Scores on the two financial performance measures. Both models present some statistical significance with the control variables. In particular, companies with lower unsystematic risk and higher price-to-book ratio seem to perform better in terms of ROE; on the other hand, smaller firms, with higher revenue growth, lower systematic risk, and a higher price-to-book ratio have a higher CAPM Alpha.

All things considered, hypotheses H1 and H2 can both be partially confirmed, as one of two measures of both accounting- and market-based profitability was statistically and positively related to ESG Scores.

Dependent Variable	ROA	ROE	Fama-French Alpha	CAPM Alpha
ESG Score	0.0005 ** (0.0002)	-0.0005 (0.0009)	0.0021 * (0.0012)	0.0008 (0.0010)
Ln Total Assets	-0.0270 * (0.0142)	0.0419 (0.0409)	-0.0471 (0.0401)	-0.0585 * (0.0329)
Revenue Growth	0.0179 (0.0118)	0.0155 (0.0137)	0.0750 (0.0514)	0.0567 * (0.0343)
Debt-to-Assets	-0.1212 ** (0.0612)	-0.3455 ** (0.1454)	0.1647 (0.1666)	-0.0772 (0.1010)
Beta	0.0008 (0.0066)	0.0156 (0.222)	-0.0344 (0.0550)	-0.0782 * (0.0425)
Price-to-Book	-0.0001 (0.0001)	0.0127 *** (0.0046)	0.0002 (0.0007)	0.0011 *** (0.0004)
Intercept	0.7010 ** (0.3234)	-0.7163 (0.9250)	0.9622 (0.8887)	1.4026 * (0.7367)
Adj. R^2	0.0539	0.3002	0.0054	0.0087
N	2645	2645	2645	2645

Table 6: Fixed effects panel regression of US public companies' financial performance on the respective ESG Score, one year of lag. The regression uses heteroskedasticity-consistent (or robust) standard errors. Significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 7 reports the results for the same regression models but with three years of lag. The positive statistical significance between ESG Scores and ROA remains, although the magnitude of the relationship in this model (beta = 0.0004) is lower than in the same model with one year of lag (beta = 0.0005). By comparison, a company with an ESG Score (three-year lag) in the 75th percentile will have a 1.18% higher ROA compared to a company in the 25th percentile. Though positive, Fama-French Alpha's relationship with ESG Scores becomes

insignificant with a longer time horizon, implying no correlation between the two. As for the ROE and CAPM Alpha models, the statistical insignificance persists.

Because the relationship between ESG Scores and ROA is still significant, hypothesis H3 can be partially accepted. Since none of the market-based performance measures had a significant relationship with ESG Scores, hypothesis H4 must be fully rejected.

Dependent Variable	ROA	ROE	Fama-French Alpha	CAPM Alpha
ESG Score	0.0004 ** (0.0002)	0.0008 (0.0009)	0.0007 (0.0012)	0.0004 (0.0009)
Ln Total Assets	-0.0249 * (0.0137)	0.0301 (0.0375)	-0.0297 (0.0374)	-0.0537 * (0.0317)
Revenue Growth	0.0177 (0.0119)	0.0159 (0.0141)	0.0740 (0.0511)	0.0567 (0.0343)
Debt-to-Assets	-0.1193 * (0.0622)	-0.3460 ** (0.1471)	0.1717 (0.1666)	-0.0744 (0.1100)
Beta	-0.0004 (0.0064)	0.0188 (0.0235)	-0.0413 (0.0544)	-0.0804 * (0.0418)
Price-to-Book	-0.0001 (0.0001)	0.0127 *** (0.0046)	0.0003 (0.0007)	0.0011 *** (0.0004)
Intercept	0.6593 ** (0.3157)	-0.5120 (0.8679)	0.6430 (0.8340)	1.3131 * (0.7145)
Adj. R^2	0.0517	0.3003	0.0042	0.0085
N	2645	2645	2645	2645

Table 7: Fixed effects panel regression of US public companies' financial performance on the respective ESG Score, three years of lag. The regression uses heteroskedasticity-consistent (or robust) standard errors. Significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

5.2 Additional Exploratory Analysis

As mentioned, consumer satisfaction was found to be a mediator of the CSR-CFP link. Several CSR activities, such as offering more sustainable products, improving service by investing more in employees, and supporting ethical causes, can drive consumer satisfaction (Galbreath and Shum, 2012). Consequently, satisfaction leads to loyalty, repurchase behaviors (Zairi, 2000), and higher customer retention (Anderson and Mittal, 2000), which all translate into superior financial performance, also in terms of market value (Fornell et al., 2006). In fact, satisfied customers build the firm's reputation (Galbreath and Shum, 2012), an intangible asset valued by investors (Cravens et al., 2003). However, most notable are the risks associated with avoiding CSR investments. Consumers are increasingly concerned about social and

environmental sustainability in their purchase decisions (Pekkanen et al., 2018), and demand firms take a stand on the issue. Consumers want firms to make it easier for them to reduce their footprint and switch to more sustainable options (Habib et al., 2019). Firms failing to adapt to these new needs might lose customers and generate dissatisfaction.

For each industry, it is crucial to consider which CSR issues are material and might impact firms' financial performance (Eccles and Klimenko, 2019). The problems mentioned above are especially relevant for the consumer goods industry, where meeting consumers' preferences and satisfying their needs are significant drivers of profitability and competitive advantage. Very few studies were conducted on the relationship between CSR and CFP in the consumer goods industry. However, Cho and colleagues (2019) found that CSR performance has a greater impact on consumer goods firms than industrial/raw material firms, as they are particularly affected by public perceptions and customer reactions. Therefore, one would expect that CSR performance has a significant positive impact on CFP as measured by accounting and market indicators for firms in the consumer goods industry.

Appendix 4 reports the results for the same regressions run above, including both lag scenarios, but only for companies in the consumer goods industry. Altogether, this sub-sample of companies does not yield significant results on the CSR-CFP relationship. Indeed, it looks like ESG Scores are not related to the financial performance of these sample companies, neither with accounting-based nor with market-based measures. A plausible explanation for why there are no significant results is that the sub-sample consists of only 139 companies.

5.3 Results Summary

Analysis	Result
Hypothesis 1	Hypothesis partially confirmed. CSR has a significant positive impact on ROA, a non-significant impact on ROE
Hypothesis 2	Hypothesis partially confirmed. CSR has a significant positive impact on Fama-French Alpha, a non-significant impact on CAPM Alpha
Hypothesis 3	Hypothesis partially confirmed. With a long time horizon, CSR has a significant positive impact on ROA, a non-significant impact on ROE
Hypothesis 4	Hypothesis rejected. With a long time horizon, CSR has a non-significant impact on Fama-French Alpha and CAPM Alpha
Additional Analysis	For firms within the consumer goods industry, CSR does not significantly impact any dependent variable, both in the short term and long term.

Table 8: Results Summary

6. Discussion

6.1 Findings in Relation to Prior Research

Coming back to the paper's research question:

What is the impact of CSR performance on the CFP of US-listed firms? Is this impact equal or different when CFP is operationalized using accounting-based indicators, compared to market-based indicators?

the answer is that CSR performance positively impacts the CFP of US-listed firms, both in terms of accounting- and market-based CFP. However, this relationship is dependent on both the particular financial indicator used and the time horizon: CSR performance has a positive impact on accounting CFP, both in the short and long term, only when measured with ROA; the impact of CSR performance on market CFP is positive only in the short term and only when measured with Fama-French Alpha. Further, the relationship does not persist for firms belonging to the consumer goods industry.

This paper's positive findings for the CSR-ROA relationship conform to those of other studies in the same research area, providing additional proof that the positive relationship persists in the short and long term. For instance, Velte (2017), Wang and Sarkis (2017), Cho et al. (2019), and Kim and Li (2021) are all recent examples of studies that specifically investigated such relationship, and all concluded that increasing CSR performance leads to a better ROA. On the other hand, this study challenges the findings of the few authors that reported a negative relationship between CSR performance and ROA. For example, according to Kang and colleagues (2010), ROA is negatively impacted when the increase in CSR performance is due to the discontinuation of harmful operations for the environment and societies. When it comes to the market-based measures, most papers, as previously discussed, use Tobin's Q as a proxy for CFP. Apart from its mixed accounting-market nature, Tobin's Q's relationship with CSR performance has been shown to be predominantly positive or insignificant at worst. This partially aligns with the results from this study, considering that with a short time horizon, the relationship between CSR performance and Fama-French Alpha was positive, whereas it became insignificant with a longer time horizon. Moreover, to the best of our knowledge, this paper is the first that investigates the relationship between CSR performance and excess returns

as measured by Fama-French Five-Factor Alpha. Therefore, finding a positive short-term relationship between the two also contributes to the literature by shedding light on the interplay between CSR performance and an indicator of market-based financial performance rarely used in this field.

The results obtained for ROA and Fama-French Alpha with a short-time horizon contribute to the stakeholder and shareholder theory debate. For long, the debate had been a moral one, considering if firms have a moral and legal duty to be responsible for all stakeholders. On this note, Dowling and Pfeffer (1975) theorized that organizations' legitimacy to conduct their operations comes from stakeholders and, therefore, firms should be accountable to them. Instead, other authors argued that firms' only responsibility is maximizing owners' wealth (Phillips and Freeman, 2003). This study's results support the stakeholder theory by bringing the discussion to a more financial level. If investing in CSR projects has the potential to increase financial performance, firms should not only prioritize shareholders but serve the interests of all stakeholders. Further, this builds a bridge between the two theories, as by focusing on all stakeholders, shareholders' wealth will still increase. The results may also be interpreted in the context of the signaling theory and the efficient market hypothesis. Since CSR performance positively affects both ROA and Fama-French Alpha, the increase in accounting profitability due to CSR efforts likely produces a positive signal to investors, which is incorporated into stock prices. Therefore, investors are aware of the profitability potential of sustainable firms and will be attracted to stocks that boost their CSR performance.

If the change in CSR performance significantly impacted ROA and Fama-French Alpha, one could have expected the same to happen for the other two CFP indicators. However, this study did not find significant results for the relationship between CSR performance and ROE or CAPM Alpha for either lag scenario. This may be due to several reasons, the most plausible one being that the accounting and market indicators of financial performance measure very different aspects of a company. On the accounting side, ROA and ROE measure profitability entirely differently: the former captures how efficiently a company uses its assets, and the latter how efficiently a company uses its shareholders' equity. Various CSR-related studies have found contrasting results between ROA and ROE because they are inherently different (Inoue and Lee, 2011). From the market perspective, Fama-French Alpha can be seen as an extension of the single-factor model on which the CAPM Alpha is calculated. With five factors explaining a stock's excess returns, Fama-French Alpha is a more comprehensive and precise

model, which may be the underlying cause of the results' discrepancy between CSR performance and the two indicators.

Further, as briefly touched upon, the two significant relationships found under the one-year lag scenario behave differently when the time horizon is prolonged. The positive CSR-ROA relationship found with one year of lag persisted with the longer time horizon. In fact, as predicted by prior literature (Nollet et al., 2016; Alareeni and Hamdan, 2020), it takes time for CSR investment to impact financial statements fully. However, the relation between CSR performance and Fama-French Alpha became insignificant as the lag increased. This result contrasts with some scholars' belief that a firm's CSR performance will influence its market value particularly in the long term (Hall et al., 2012; Orsagh, 2019). Arguably, the insignificant results found between CSR performance and excess market returns in the long run may be due to the swift action of the efficient market hypothesis. Indeed, information about companies' sustainability efforts may be rapidly integrated into stock prices as investors react to the news. As time goes by, the change in a company's stock value may likely be caused by the most recent pieces of information (Malkiel, 2003). This is not to say that the older information is no longer integrated into the stock price but that the current stock price may be more correlated with the most recent news. This is even more plausible considering that US stock markets are some of the most active in the world (IMF, 2022). An alternative explanation might be the opposite, that is, it takes longer than only three years for CSR investments to be fully reflected in stock prices (Orsagh, 2019). This would suggest that CSR efforts would be reflected in stock prices almost immediately or after a long time.

Finally, the additional exploratory analysis unveiled how CSR performance does not meaningfully impact accounting and market CFP for US consumer goods firms. This is in direct contrast with Cho et al. (2019) study, which affirms that consumer good firms' CSR efforts are connected to financial performance. The author stresses how consumer goods firms are particularly exposed to public perceptions, especially given the increasingly important role of sustainability in customers' purchasing and consumption decisions. On the same line, Galbreath and Shum (2012) highlight how investing in CSR projects generates satisfaction among customers, consequently leading to superior financial profitability. There might be a simple explanation behind this paper's non-significant results. A survey published in Harvard Business Review revealed how 65% of US consumers are interested in buying sustainable products or products from responsible companies. However, it is crucial to distinguish between

what consumers are willing to do and their actual behavior, as only 26% of US consumers actually end up buying sustainable products and services (Habib et al., 2019). The issue often lies in the higher price associated with those offerings. Accordingly, several authors suggest the existence of an attitude-behavior gap, meaning that consumers are not actually ready to pay a sustainability premium on responsible products and services (Pekkanen et al., 2018; Gatzer and Magnin, 2021). Hence, heavier investments in CSR activities do not always necessarily increase financial gains for consumer goods firms.

6.2 Implications

Following the results of this paper, managers and corporations can better understand how their CSR efforts might translate into financial outcomes. First, those companies that are doubtful about the costs and benefits of investing in CSR projects can count on the fact that ROA will positively benefit, both short and long term. Further, a low ROA compared to industry peers may likely indicate that the management is not effectively using its financial resources, which is considered a red flag by many investors (Birken, 2021). Thus, striving to improve CSR performance may be a good way of looking more attractive in the eyes of investors. Second, this study shows that, at least in the short term, excess returns as measured by Fama-French Alpha increase the more a company increases its CSR performance. Therefore, company management should not be concerned about not meeting shareholders' expectations when trying to make the company more responsible. Lastly, again with reference to the findings of this paper, company managers can – and should – be bolder in their CSR strategies, to improve their company's score on the ESG scale. Indeed, this study has not found any negative results indicating that increasing one's CSR performance decreases returns in either accounting- or market-based measures. This also applies to consumer goods firms that, while managing expectations regarding the financial benefits of their CSR projects, can still expect no damage to their profitability.

Companies' managers are not the only stakeholders for whom the results of this study can be practically used. Investors are also affected by companies' decisions to invest in CSR activities, and frequently their own investment targets depend on the CSR performance of companies. As previously mentioned, a survey from Pwc (2022) found that most US investors are willing to sacrifice short-term returns with the condition that the longer-term ones are not affected. Moreover, in the same survey, 20% of investors were willing to accept a lower overall rate of return to have a beneficial impact on society and the environment. This paper shows that

investors funding CSR-related companies out of benevolent interest and resigned to the fact that their returns would suffer, should actually not be concerned about sacrificing returns. Indeed, there is no evidence of corporate excess returns being negatively impacted the more a company invests in CSR-related activities: excess returns can at the very most increase and in the worst case be left untouched, should the firm in question increase its CSR efforts.

Finally, in the US, Democrats and Republicans have contrasting views on the CSR matter, as previously mentioned. The former political party is very committed to promoting social equality and green jobs through the needed regulations, regardless of their stringency, as a means of stimulating the economy (Democrats, 2022); the latter political party, instead, wishes to loosen stringent CSR-related regulations, driven mainly by the fear that they will harm companies' returns and profits, employment rates, and the economy as a whole (Davie and Oliphant, 2019). This paper's results highlight the groundlessness of such a fear for companies' returns, and it promotes the need for an improvement in firms' CSR performance. The current situation with environmental disasters, inequalities, and corruption creates the need for more stringent regulations to address these issues. Assuming that such regulations would improve the CSR performance of companies, their implementation would not harm companies' returns, but it may even increase them. Moreover, issuing grants and incentives for companies that meet CSR goals may also stimulate the economy while promoting sustainable development.

7. Conclusion

7.1 Final Remarks

This research explored the impact of US firms' CSR performance on financial performance, which was gauged with both accounting and market indicators to get a deeper understanding of the phenomenon. What emerged from the findings is that there is no clear-cut relationship between the two constructs, but rather their relationship depends on the financial indicator employed and the time horizon considered. However, one clear result is that, for US firms, an increase in CSR performance does not significantly negatively impact financial performance. Therefore, *engaging in CSR activities does not hurt firms' financial performance.*

This is especially relevant given the challenges facing US corporations. As stakeholders are increasingly concerned about social, environmental, and governance sustainability, being responsible is not an ethical dilemma for corporations anymore but rather a precondition for their long-term survival. Simply look at what happened to Abercrombie & Fitch, the once most loved US apparel company. Years of discrimination towards new hires and instilling insecurities in teenagers turned the company into a financial disaster, with its stock price and sales in free fall, until the firm's CEO stepped down in 2014 (Biondi, 2022). Nevertheless, American executives are still often reluctant to recognize the essential role that CSR must play in organizations' strategy (Whelan and Fink, 2016). Following this study's findings, all corporations should address CSR issues. It might not always increase organizations' financial profitability, but at worst, it will ensure their long-term survival.

7.2 Limitations and Opportunities for Further Research

One of the main shortcomings of this research is related to the nature of CSR data. Firstly, ESG Scores are based on information entirely disclosed by firms, making it challenging to set apart the effect of CSR performance and CSR disclosure (Eliwa et al., 2021). As Drempetic and colleagues (2019) outline, what is reported by companies determines their CSR performance in the eyes of investors and credit agencies, and not reporting equals not performing. This study's data provider, Thomson Reuters, tries to eliminate this transparency bias by weighting the information disclosed by companies based on their materiality. However, it is still necessary

to be cautious when interpreting ESG Scores, especially in a country such as the US, where at the federal level, there is still no mandatory requirement for listed corporations to disclose all ESG information (Poole and Sullivan, 2021). To partially overcome this limitation, future studies could use ESG Scores that incorporate NGOs and news outlets' information regarding firms' CSR scandals or merits to get an external view of firms' efforts. Secondly, different ESG data providers jump to different conclusions regarding firms' CSR performance scores, even if they are based on the same publicly available information (Halbritter and Dorfleitner, 2015; Hussain et al., 2018). Therefore, the magnitude and direction of this paper's results are related to the ESG rating provider Thomson Reuters. Future studies could compare or cross-reference data from different ESG Scores providers to get a clearer picture of the CSR-CFP link. Finally, as most CSR studies, this research assumes that a change in firms' CSR performance is related to investments in CSR. However, these investments might not be effective enough to increase CSR performance, or a firm's CSR score might naturally vary because of changes in the competitive landscape (since ESG Scores are computed relative to other firms in the same industry and country). Further research could use actual data on firms' CSR investments. However, given the lack of harmonized sustainability reporting regulation in the US (Poole and Sullivan, 2021), it might currently be challenging to obtain such information.

Another limitation of this study is related to the sample size. The decision to focus on the US market and the availability of ESG Scores significantly limited the sample. Increasing the sample size could have given more explanatory power to the model and might have resulted in more significant findings (Hayat, 2010). Other Western countries with economies similar to the US could be considered in future studies to increase the sample size. Moreover, to avoid further reducing the sample, the long time horizon model only features a lag of three years between ESG and CFP. In fact, the further in the past, the less available firms' ESG data. It might be argued that this is not a proper "long-time" horizon, as some executives claim that it takes a minimum of five years for CSR investments to be fully reflected in firms' financial performance (Orsagh, 2019). However, for this research, three years still represent a longer time span than the base model with one year of lag, allowing the study to explore the relationship of interest in different conditions.

Further, from the results of this paper, it is possible to conclude that increasing firms' CSR performance will not hurt financial performance in absolute terms but not necessarily in relative terms. Each corporation might have its own internal financial targets, and the financial resources depleted to increase CSR performance might not generate an increase in CFP high

enough to meet those targets or could have been put to a different use that would have generated an even higher increase in CFP (i.e., opportunity cost). Future studies could investigate if the monetary amount invested by corporations in CSR generates enough return based on internal targets or based on the next best possible investment available. Finally, the relationship between accounting and market indicators is only explored by examining their respective relationship with CSR performance. Based on the signaling theory, future research could look at how an increase in market performance might be triggered not only by an increase in CSR performance but also by an increase in accounting performance itself.

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Appendix

1. Example of Fixed-Effects on Amazon (AMZN)

Amazon (AMZN)

	2012	2013	2014	2015	2016	2017	2018	2019
ROA (CFP)				1,0%	3,3%	2,1%	6,7%	6,0%
ESG Scores (one-year lag)			49,6	50,7	65,6	72,1	85,4	
ESG Scores (three-year lag)	42,6	45,9	49,6	50,7	65,6			

The illustration above shows a visual example of how the fixed-effects regression estimations work using ROA as CFP indicator, for one of the sample companies: Amazon.com (AMZN). For each lag scenario, the model looks at the change in ESG Scores and ROA from the first to the second data point (i.e., see the arrows), looking for a possible correlation. The peculiarity of fixed-effects is that this process is done only *within* each firm, like the above example, and not *across* firms. For instance, for the short-term scenario, the model would identify an increase from 49,6 to 50,7 in ESG Scores and compare it to the 1,0% to 3,3% increase in ROA, thus identifying a possible positive relationship.

Fixed-effects are used when it is suspected that there are certain time-invariant and unobserved variables that divide the sample into groups. The different entities thus belong to separate groups. For instance, one such variable might be industry belonging, where different entities belong to different industries, and the specific industry of a company may impact the magnitude of the effect of CSR performance on CFP. So, the fixed-effects model assumes that the group means are held constant, thus controlling for this group-level effect.

2. ESG Scores Distribution

ESG Score Distribution (2012)
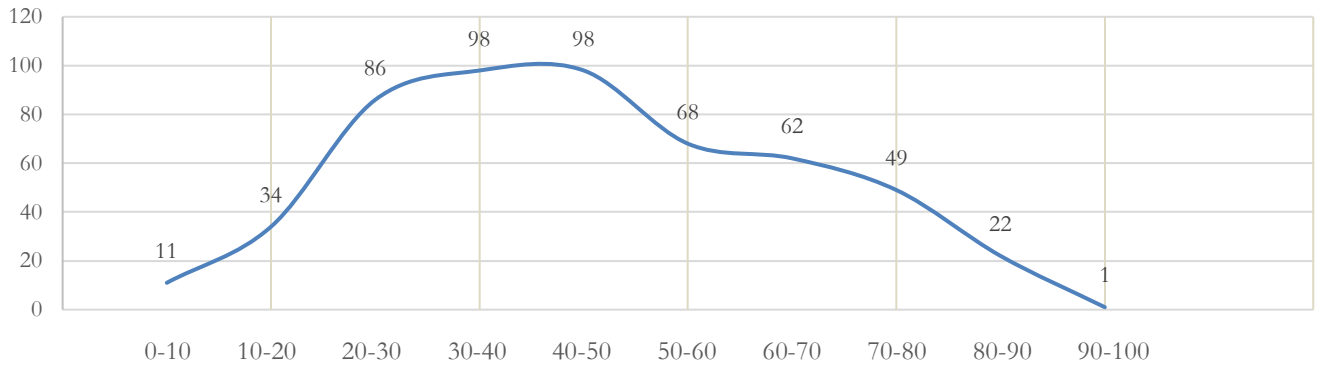
Distribution of the 529 companies' ESG Scores across percentiles for the year 2012. The graph shows the number of companies whose ESG Score falls within a certain percentile.
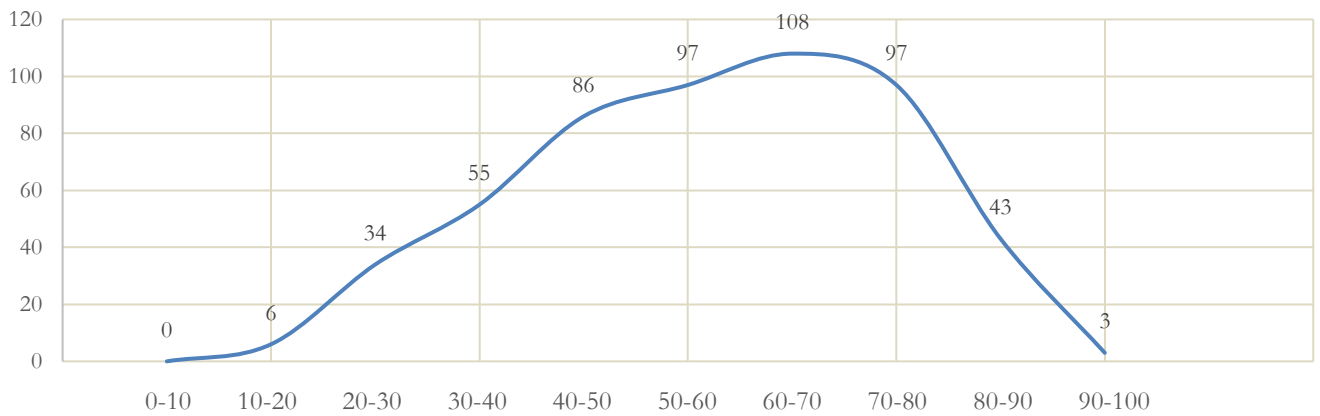
ESG Score Distribution (2018)

Distribution of the 529 companies' ESG Scores across percentiles for the year 2018. The graph shows the number of companies whose ESG Score falls within a certain percentile.

3. Correlation Matrix

Pairwise correlations – One-year Lag

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) ROA	1.000									
(2) ROE	0.215*	1.000								
(3) FamaFrenchAlpha	0.112*	0.021	1.000							
(4) CAPMAlpha	0.161*	0.027	0.719*	1.000						
(5) ESG	0.079*	0.055*	0.016	0.038	1.000					
(6) LNTotalAssets	-0.153*	0.014	-0.004	0.007	0.419*	1.000				
(7) RevenueGrowth	0.107*	0.017	0.073*	0.086*	-0.019	-0.011	1.000			
(8) DtoA	-0.072*	-0.059*	0.022	0.032	0.073*	0.096*	-0.044	1.000		
(9) Beta	-0.131*	-0.012	-0.055*	-0.180*	-0.143*	-0.148*	-0.015	-0.054*	1.000	
(10) PtoB	0.097*	0.578*	0.024	0.071*	0.022	-0.012	0.017	-0.033	-0.016	1.000

$p<0.01$

Pairwise correlations – Three-year Lag

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) ROA	1.000									
(2) ROE	0.215*	1.000								
(3) FamaFrenchAlpha	0.112*	0.021	1.000							
(4) CAPMAlpha	0.161*	0.027	0.719*	1.000						
(5) ESG	0.064*	0.059*	0.009	0.028	1.000					
(6) LNTotalAssets	-0.153*	0.014	-0.004	0.007	0.416*	1.000				
(7) RevenueGrowth	0.107*	0.017	0.073*	0.086*	-0.030	-0.011	1.000			
(8) DtoA	-0.072*	-0.059*	0.022	0.032	0.053*	0.096*	-0.044	1.000		
(9) Beta	-0.131*	-0.012	-0.055*	-0.180*	-0.120*	-0.148*	-0.015	-0.054*	1.000	
(10) PtoB	0.097*	0.578*	0.024	0.071*	0.002	-0.012	0.017	-0.033	-0.016	1.000

$p<0.01$

4. Results of Additional Exploratory Analysis

Dependent Variable	ROA	ROE	Fama-French Alpha	CAPM Alpha
ESG Score	0.0001 (0.0002)	-0.0005 (0.0046)	0.0033 (0.0033)	0.0002 (0.0023)
Ln Total Assets	-0.0246 ** (0.0102)	-0.0782 (0.1799)	-0.0258 (0.0793)	-0.0715 (0.0617)
Revenue Growth	0.0351 *** (0.0109)	0.2530 (0.1856)	0.1042 (0.1526)	0.2177 * (0.1114)
Debt-to-Assets	0.0045 (0.0537)	-1.3508 (1.0474)	0.2584 (0.2866)	0.0330 (0.1411)
Beta	-0.0044 (0.0091)	-0.1769 (0.2156)	-0.1192 (0.0812)	-0.2184 *** (0.0647)
Price-to-Book	-0.0001 (0.0001)	0.0611 (0.0446)	0.0007 (0.0004)	0.0007 (0.0004)
Intercept	0.6432 *** (0.2333)	2.2974 (4.1292)	0.4006 (1.8026)	1.7857 (1.4033)
Adj. R^2	0.0252	0.3564	0.0102	0.0187
N	695	695	695	695

Fixed effects panel regression of financial performance on the respective ESG Score of US public companies in the consumer goods industry, one years of lag. The regression uses heteroskedasticity-consistent (or robust) standard errors. Significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Dependent Variable	ROA	ROE	Fama-French Alpha	CAPM Alpha
ESG Score	-0.0001 (0.0003)	0.0039 (0.0026)	-0.0025 (0.0029)	-0.0038 (0.0023)
Ln Total Assets	-0.0230 ** (0.0103)	-0.0033 (0.0677)	0.0200 (0.0755)	-0.0407 (0.0615)
Revenue Growth	0.0341 *** (0.0114)	0.0928 (0.0698)	0.0730 (0.1497)	0.1924 (0.1101)
Debt-to-Assets	0.0055 (0.0542)	-0.9399 (0.6210)	0.2824 (0.2709)	0.0310 (0.1349)
Beta	-0.0050 (0.0090)	0.1095 (0.1580)	-0.1371 (0.0841)	-0.2293 (0.0655)
Price-to-Book	-0.0001 (0.0001)	0.0128 ** (0.0056)	0.0007 (0.0004)	0.0005 (0.0004)
Intercept	0.6177 ** (0.2349)	0.2434 (1.4877)	-0.3424 (1.7132)	1.2892 (1.3799)
Adj. R^2	0.0248	0.2178	0.0092	0.0222
N	695	695	695	695

Fixed effects panel regression of financial performance on the respective ESG Score of US public companies in the consumer goods industry, three years of lag. The regression uses heteroskedasticity-consistent (or robust) standard errors. Significance: *** $p<0.01$, ** $p<0.05$, * $p<0.1$