The Role of ESG Performance in Firms' Resilience During the COVID-19 Pandemic: Evidence from Nordic Firms

Habeeb Yahya*

Accounting and Finance Department, University of Turku

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Abstract

Firms' activities in issues of corporate social responsibility and environmental sustainability have been documented to provide a competitive advantage that enhances financial performance, especially in tightened economic situations. Similarly, studies on countries' economic performance during the COVID-19 pandemic show a significant effect of movement restriction (lockdown) as a spread-containment strategy. This paper analyses the exogenous effect of lockdown on firm performance during the COVID-19 pandemic and the role of firms' sustainability in resilience to the pandemic. Using difference-in-differences analysis on data of publicly listed Nordic firms, this study shows a positive and significantly different revenue and profitability for firms listed in lockdown countries compared with those in the country without a lockdown. Further analysis shows that sustainability provides resilience for firms during the COVID-19 pandemic as firms' environmental and social performances are positively related to revenue, profitability, and valuation. This support the conclusion that customer and investor preferences enhance sustainable firms' performance.

Keywords: ESG performance; financial performance; firm valuation; lockdown; COVID-19; Nordic countries.
JEL: G3, H12, M14

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1 Introduction

According to Maillard and Gonzalez (2006), biodiversity loss is a result of human impact which pose a serious threat to sustainable development and could result in pandemic through epidemic outbreaks. As such, the COVID-19 pandemic has further stressed the importance of environmental sustainability in firms. In addition, as economies struggle to weather the storm of the health crisis, the pandemic threatens the financial performance of firms through stiff economic conditions that affect earnings and stock returns. Financial crises have been the most studied crisis in the literature on corporate social responsibility (CSR) on firm financial performance, the most recent being the global financial crisis (GFC) of 2008-2009. An example of such studies is Lins et al. (2017) which show that firms with high social capital could absorb the GFC shock better than those with low social capital as measured by the intensity of corporate social responsibility. However, the COVID-19 crisis differs from typical financial crises in that it caused an unexpected shock to the global stock market resulting from an economic lockdown. The shock is also because it is mainly from health concerns and not economic conditions (Albuquerque et al., 2020). This means firms have little time to respond to the challenges of the crisis as it unfolds.

Recently, many studies on ESG relationship with firm performance have focused on the relevance of firms' sustainability during the stock market crash during COVID-19 (see, e.g., Pavlova and de Boyrie, 2022; Broadstock et al., 2021; Lööf et al., 2022; Ferriani and Natoli, 2021; Singh, 2020; Albuquerque et al., 2020; Pástor and Vorsatz, 2020). These studies' consideration is from an investors' ESG investment strategy perspective. Other studies (see, e.g., Hwang et al., 2021; Zhang et al., 2022) have considered the impact of the pandemic on the sustainability and financial performance of the firms. A third category of the studies has considered both stock performance and operating performance (e.g., Albuquerque et al., 2020). However, the results of these earlier study groups have differed. For example, on ESG investment strategies, Singh (2020), Albuquerque et al. (2020), and Pástor and Vorsatz (2020), all find better performance for ESG strategy during the COVID-19 pandemic whereas Demers et al. (2020), Döttling and Kim (2022), and Pavlova and de Boyrie (2022) all document contrary evidence.

Overall, the mixed results in findings are due to the nature of the crisis and the characteristic differences between countries. COVID-19 is a health crisis that suggests that there is a long-term impact on world economic, political, environmental, and social conditions with uncertainties. This means data differences

especially as related to countries can influence the outcomes of the study. Similarly, most firms today do one thing or the other on sustainability and because there are no standardized ESG ratings, many are still not captured in the ratings available. This means in country-level analyses of the effect of COVID-19 on the economy, the countries' economic response is as important as isolating firms' sustainability in understanding how firms navigate through the crisis from a market perspective especially because the stock market crash is a result of an exogenous shock from the pandemic. In addition, more detailed studies (see, e.g., Ke and Hsiao, 2022) have shown that specifics e.g. containment strategies such as movement restrictions (lockdown) and the number of cases (Hu and Zhang, 2021) should be studied to understand the effect on economic and firm performance.

This study investigates the implication of movement restriction (lockdown) during the COVID-19 pandemic on firms' financial, non-financial, and sustainability performance using data on the Nordic countries. This data provide us with the unique opportunity (as in e.g., Lueg and Pesheva, 2021) to examine the differences in the economic shock in lockdown vs no lockdown situations from a cross-border perspective. This approach allows us to understand firms' resilience in times of crisis as well as examine the effect of the exogenous shock given varying economic, health, and social responses. This study considers the profitability measure (ROA), and valuation (Tobin's Q) to capture both the present performance of firms during the period of the crisis and the investment prospect for the future while the revenue (Sales) as Wagenhofer (2014) pointed, provides insights to understanding the sources of firm profitability and value generation during the period under study. Similar to Albuquerque et al. (2020), the environmental and social performance (E and S of ESG scores) of firms is the proxies for sustainability aimed at establishing the absorbing strength of 'sustainable firms' to the COVID-19 pandemic. The experience of the GFCs has shown that crises pass, but the lessons remain and are important tools for future planning. In addition, the progress recorded in firms' sustainability in the last decade is an incentive to provide useful information for stakeholders on the relevance of sustainability for firms, also in times of crisis.

The result of this study shows that no significant difference exists in firm profitability and valuation with or without the lockdown treatment during the COVID-19 pandemic. This implies that the shock of COVID-19 is severe enough to affect firm performance regardless of the health treatment measure imposed by the government of a country. However, this study documents that the social performance of firms in countries with lockdown treatment is higher and significantly different from the country without lockdown.

The analysis of sustainability impact on firm performance during the COVID crisis shows that the ESG performance of firms is positively related to profitability and firm valuation. Though the comparison between ESG firms[1] and non-ESG firms[2] shows that the ESG firms are less profitable in the year of COVID-19 lockdown, the positive economically significant relationship between firm ESG and profitability in the post-lockdown COVID-19 year (2021) is an encouragement on the path to recovery for the firms. Contrarily, firm valuation is positively related to ESG performance over the period during the lockdown year and the post-lockdown years.

This study provides the following contributions. First, the focus on identifying the exogenous effect of the lockdown shock on economies brought about by COVID-19 helps establish useful knowledge on whether it significantly impacts a firm's financial and non-financial performance during the period. Second, this study considers the impact of ESG on firm performance during the crisis (especially in the lockdown and post-lockdown years) as earlier studies claiming resilience in sustainable firms suggests. Finally, the approach of this study is unique in the opportunity the data provides as we can compare the performance of firms in countries with or without lockdowns to isolate the effect of sustainability on firm performance during the COVID-19 pandemic.

The rest of the article is organized as follows. Literature review and hypothesis development as well as a research design are discussed in Sections 2 and 3 respectively. In Section 4, the main empirical results and additional considerations are presented and discussed with intuitions while the final section sets out the conclusions and offers suggestions for further research.

2 Literature review and hypothesis development

2.1 Covid-19 pandemic, the Nordic experience, and impact on firm performance

A market-wide financial crisis began in the early months of 2020 as a result of a novel pandemic later named COVID-19 which was first identified in a city called Wuhan in China. The number of cases in Wuhan grew quickly up to about 60,000 within a month and was transmitted across national borders by travelers who tested positive before a lockdown was imposed in China. Public-health experts swung into action in readi-

[1] ESG firms are firms that have ESG score(s) in the Thomson Reuter Refinitiv database
[2] Non-ESG firms are firms that have no ESG score(s) in the Thomson Reuter Refinitiv database

ness to curtail the spread of the pandemic locally and internationally by imposing travel bans and movement restrictions (lockdown). To the world's surprise, Sweden through the recommendation of her public-health experts approaches the pandemic in an unorthodox way by allowing her residents to decide individually whether to take precautions such as using facemasks and restricting their movement (lockdown) for the major part of the year 2020.

According to Yarmol-Matusiak et al. (2021), despite the healthcare infrastructure, population demographics, and economic similarities between four Nordic countries (Norway, Sweden, Finland, and Denmark), the health recommendation of the individual country governments, the intensity of the implementation and public adherence to the recommendation resulted in different outcomes in these countries. The approach by Sweden was a recommendation that suggests only the vulnerable would prefer to stay home while the healthy people could carry on with their economic activities with the possibility of having mild COVID-19 cases that would lead to the collective immunity of the country's population and ensure the economy does not suffer. Unfortunately, this move hasn't recorded the set objective as a report in the Insider on August 21, 2021, presented relative figures that showed higher COVID-19 per capita cases than the UK and Italy[3]. According to the same report, the COVID-19 deaths recorded is about 145 per 100,000 persons which is three times higher than Denmark, eight times higher than Finland, and almost ten times higher than Norway.

The consequences of the no-lockdown in Sweden are not only shown in the effect of the health crisis on the country, the economic impact is as obvious. Like most other countries, Sweden witnessed the largest quarterly fall in its history in 40 years with the economy shrinking by 8.6% from April to June 2020, a figure higher than what is recorded by Denmark (7.4%), Norway (5.1%) and Finland (3.2%). While other countries in the Nordics (Finland, Denmark, and Norway) all witnessed a smaller rise in unemployment of around 1% point on average, Sweden recorded an unprecedented rise from 6.6% in March 2020 to 9.5% in March 2021[4] . The rare opportunity to test the externality of economic shock by way of difference in the approach (no-lockdown) of Sweden contributes to the literature on firm performance in crisis and particularly to test the theory of resilience of sustainable firms in turbulent times. These statistics is confirming the study by Yarmol-Matusiak et al. (2021) conducted to verify infection, recovery, and mortality rates. The economic implication of COVID-19 is understandably different for Sweden which had a less restrictive and

[3] The UK and Italy are in the top ten highest number of COVID-19 cases in the world according to the World Health Organization statistics (WHO) at the end of 2020.

[4] Statistics are available on individual countries' national databases on COVID-19 and the economy.

slower implementation due to a higher incidence rate across all ages and especially a higher COVID-19 death rate. Similar to Ke and Hsiao (2022) conclusion, we know what happens to firm performance in countries with lockdown, but to understand what could happen without a lockdown, we can study the performance of firms in the country(s) with similar population demography, economic and health care infrastructure without lockdown. Therefore, following in the line of economic decline witnessed in Sweden as a result of the no-lockdown decision, this study hypothesizes that

Hypothesis 1 (H1a): Firms in lockdown countries have better financial performance than firms in the no-lockdown country

The disruption caused to the global economy during the COVID-19 pandemic resulted in decreased profits and profitability of firms (Meirun et al., 2022). There is a negative relationship between the COVID-19 pandemic and firm performance (Shen et al., 2020). Thus, this begs the question, how firms in countries with a lockdown (with potentially more tightened economic situation) would have better financial performance than firms in no-lockdown countries. In addition, the COVID-19 pandemic is a challenging period for businesses that has put their pledge to corporate social responsibility (CSR) to the test (He and Harris, 2020). That is, firms are in struggles of finding a balance between protecting their business and stakeholders' interest (Asante Antwi et al., 2021). The pressure of balancing these interests may result in some firms prioritizing gains in the short term while reducing investment in CSR activities in order to survive the turbulent time. This is a possibility that is confirmed by the need for firms affected by disasters to reduce their investment in CSR to contain costs in the absence of slack resources (Lee et al., 2013).

Nevertheless, the pandemic has presented businesses with a chance to transform their Corporate Social Responsibility initiatives and use them to tackle pressing environmental and social issues globally (He and Harris, 2020; Qiu et al., 2021). For example, companies have combated the COVID-19 spread by protecting their employees, customers, and communities despite intense financial pressure (Mao et al., 2021), and hotels around the world offered free rooms to medical staff and rooms for self-isolation at discount prices (Walker, 2020). This study predicts that firms' activity in sustainability (measured in the E and S issues of ESG) and especially social performance is significantly different for firms in countries with lockdown from firms in countries without a lockdown. The resulting influence of such improved CSR performance explains the better financial performance of firms in lockdown countries as Youn et al. (2016) argued that positive CSR can lead to a higher valuation. Franco et al. (2020) also concluded that stakeholders reward companies with

high CSR. Thus the following hypothesis is proposed.

Hypothesis 1 (H1b): Firms in lockdown countries have better ES performance than firms in the no-lockdown country

2.2 COVID-19 spread-containment and the impact on firm performance

Many studies on COVID-19 have focused on the impact on the economy through the financial market where stock market volatility (e.g. Narayan et al., 2021; Baek et al., 2020), liquidity (e.g. Just and Echaust, 2020), risks (e.g. Rizwan et al., 2020), and returns (e.g. Narayan et al., 2021; Shen et al., 2020) have been researched (Hu and Zhang, 2021). Though fewer studies have focused on the firm-level analysis of the real impact due to data limitations, the general opinion is that economic downturn and low firms' financial performance during the COVID-19 pandemic are due to obstruction in the supply chain, halted production and distribution (e.g. Ke and Hsiao, 2022; Hu and Zhang, 2021). However, of equal and more significant impact is the lower disposable income of customers (Eichenbaum et al., 2021). Many employees were laid off and others had to take pay cuts, business owners especially small and medium enterprises whose personal finance is still largely connected to the company have struggled with living expenses. The resulting lower disposable income leads to reduced revenue from sales and patronage in both product and service firms. Diewert and Fox (2020) concluded that the unprecedented nature of the COVID-19 pandemic especially in lockdown means key economic indicators such as the consumer price index (CPI) are difficult to construct and can only be done through continuous consumer expenditure surveys.

Similarly, in the face of the ongoing debate about the economic implication of different pandemic spread containment strategies (e.g., Eichenbaum et al., 2021, 2022; Diewert and Fox, 2020), Ke and Hsiao (2022) documented evidence of a counterfactual GDP growth rate during and outside of lockdown in China. They confirm that though the lockdown in Q1 of the year 2020 reduced the spread of COVID-19 in the country, the economic implication was severe as would be seen in the quick general economic recovery (except for the slow transportation sector recovery) after the restriction in the movement was lifted in April of the same year.

The theory of customer preference explains the possible difference in firms' financial performance during COVID-19 (Albuquerque et al., 2020). Albuquerque et al. (2019) discuss the customer preference theory

around firm ESG activities as a product differentiation strategy i.e. for firms with clear ESG policy, their product is set apart from others in choice available to customers (especially those keen on sustainability issues). The implication is that in customers' tightened economic situations such as during the pandemic outbreak, the ESG firms benefit through customer loyalty and the lower price elasticity of product demand. These firms have resiliency and better performance where COVID-19 shock affects consumer demands as a result of higher profit margins from the ability to charge higher prices. Thus, firms have the incentive to increase ESG performance during a crisis, especially where more stringent conditions like lockdowns which could affect sales and revenue are in place as a way of product differentiation at the very least. Thus this study proposes the following hypothesis:

Hypothesis 2 (H2a): The environmental and social performance of firms is increasing firm revenue and profitability during COVID-19 pandemic

Similarly, from the investor preference theory perspective, Renneboog et al., 2011 argue that sustainable and responsible investment (SRI) can explain the link between ESG and firm financial performance. Their argument aligns with studies in the SRI literature (e.g. Bollen, 2007) suggesting less sensitivity for investors with a preference for ESG stocks in SRI funds' performance when compared to conventional mutual funds' performance. This implies that as the COVID-19 shock may affect an investor's attitude to risk, leading to some investors divesting their holdings, ESG investors can resist the pressure of selling when compared to other stock investors. This study expects that firm valuation is enhanced with increased ESG performance during the COVID-19 pandemic as a result of accompanying shareholder's engagement from ESG disclosure that reduces agency costs and information asymmetry thereby improving investors' trust (Cheng et al., 2014). Thus, the following hypothesis is proposed:

Hypothesis 2 (H2b): The environmental and social performance of firms is increasing firm valuation during COVID-19 pandemic

3 Research design

3.1 Data

This study uses both the financial and ESG rating data of publicly listed firms on a Nordic (Finland, Sweden, Norway, Denmark, and Iceland) stock exchange downloaded from the Thomson Reuters Eikon's database on November 19, 2021[5], for the period from 2017 to 2021. The significance of sustainability in company practices goes beyond the size and status of a firm. To this end, this study ensured that all publicly listed firms during the sample period in the region are covered by including main stock exchanges (Nasdaq Helsinki Ltd, Nasdaq Stockholm AB, Nasdaq Copenhagen A/S operated exchanges in Finland, Sweden, and Denmark respectively, and the Oslo Børs ASA in Norway) as well the multilateral trading facilities (MTF)[6]. Overall, 1,775 Nordic firms are in the sample and 530 (of which Finland 69 firms, Iceland 7, Norway 103, Denmark 84, and Sweden 267) firms[7] have ESG data for the period.

3.2 Empirical design

To study the effect of the economic shock imposed by the lockdown, this study compares the treatment effect of the Covid-19 spread measure i.e. restricted movement on the firms in the countries (Finland, Denmark, Norway, and Iceland) that must have imposed it at one point or the other during the COVID-19 year with a country (Sweden) that had no defined restriction in movement during the period.[8] Sales is the measure of revenue and return on assets measures the profitability of firms during the pandemic. This study focuses on the environmental (E) and social (S) pillar scores of ESG and derives a combined score ES- the equally-weighted average score for the environmental and social pillars. These pillar scores are the two expected to be relevant to the COVID-19 period resilience of sustainable firms (Albuquerque et al., 2020). The focus on these two pillars is also to avoid capturing the governance effect. This effect stems from the fact that the governance score is based on the relative performance and materiality of ESG factors at the country level,

[5] Updated in June 2022 to include 2021 firm financial and ESG data to examine the post lockdown COVID years performance of firms.

[6] The MTFs are commonly used by growth companies in their early stages of growth and develop. They are the First North Sweden, First North Finland, and Nordic SME.

[7] Models were re-estimated banks and Insurance firms excluded for robustness and the results are basically similar.

[8] Lockdown in this study is not considering the time of year or how long or the stringency of enforcing it. This is because ESG performance and financial performance are typically reported as an aggregate of activities during the year for which obstruction like lockdown would have an effect in any case.

unlike the environmental and social scores that are based on within the firm's sector. Firm performance during the COVID-19 pandemic years is measured using revenue (Sales), profitability (ROA), and valuation (Tobin's Q). These variables have been widely used as measures of firm performance in earlier studies, Sales (e.g. Armstrong et al., 2011; Wagenhofer, 2014), ROA (e.g., Velte, 2017; Fatemi et al., 2018), and Tobin's Q (e.g., Tang et al., 2012; Ahsan and Qureshi, 2021). As controls for firm-level differences, this study employs the natural logarithm of total assets as a measure of firm size (as in e.g., Buallay, 2018) and debt-to-equity ratio as a measure of firm leverage (e.g., Grewal et al., 2008), the cash and short-term investments over total assets are used to capture cash holding of firms, and property, plant, and equipment over total assets represent firm tangibility (e.g., Hu and Zhang, 2021). To ensure the country effect is not in play in our analysis, the growth in the gross domestic product (GDP) is included to especially isolate the externality of the shock to the economy during the period under study (e.g. Buallay, 2018).

In the difference-in-difference regressions, the treatment effect test of lockdown on firm financial performance, valuation, and sustainability in crisis is carried out as below:

$$\begin{aligned} FirmPerformance_{it} = \beta_0 + \beta_1 LDtreatment_{it} + \beta_2 LockdownYR_t + \beta_3 LDtreatment_{it} \times LockdownYR_t \\ + \gamma Controls_{it} + \delta_i + \epsilon_{it} \end{aligned} \tag{1}$$

where firm performance is proxies with *ROA* (a profitability measure) i.e. a company's net income during a particular year over the book value of assets (equity and debt) at the end of the year, *LnSales* (as a measure of firm revenue) i.e. natural logarithm of firm sales during the year, or sustainability measures (the *ES* score, *E*, and *S* pillar scores). *LDtreatment* is a dummy variable that equals one for firm i if it's listing location is in any of the countries that imposed lockdown during year t and zero otherwise. $LockdownYR_t$ is a dummy that equals one if there is any form of movement restriction in the country during that year of COVID-19 (in this study 2020) and zero otherwise. *Firm Size* is the natural logarithm of the book value of total assets of firm i at time t. *Leverage* is total debt divided by total equity in percentage i at time t. *Cash Holding* is cash and short-term investments over total assets in percentage i at time t and *Tangibility* is tangible assets (property, plant, and equipment) over total assets in percentage i at time t. *GDP growth* is a country-level control to capture the economic performance in the country where the company is domiciled. Regressions with or without industry-fixed and country-fixed effects are used in different models.

Next, this study considers the revenue, profitability and valuation of ESG firms during COVID-19 to confirm the customer and investor preference theory that has been said to benefit socially responsible businesses in the literature. These sets of the regression model are described in the following:

$$FirmPerformance_{it} = \beta + \beta_1 ES_i + \beta_2 ES_{it} \times COVIDYR_t + \gamma Controls_{it} + \delta_i + \epsilon_{it} \quad (2)$$

where firm performance is *Sales*, *ROA*, or *Tobin's Q* (the market valuation of a company divided by its assets' replacement cost, where replacement costs have typically been proxied by equity book value plus the liabilities book value) as the dependent variables in the different models, β is the common constant, ES_i is the equally-weighted average score for the environmental and social pillars for firm i in the year t. Pillar scores analysis is done using the ESG's sub-category scores by replacing the ES score with a pillar score for environmental E_t and social S_t, $COVIDYR_t$ is a dummy that equals one if the year is a year of COVID-19 (in this study 2020 and 2021) and zero otherwise, other variables in the models are as defined earlier. In the additional model, this study examines ESG firms' performance in crisis by considering if it differs significantly from non-ESG firms (i.e. firms without ESG scores). This is an interaction between $ESFirms_{it}$ dummy (1 if a firm has ESG ratings at time t and zero otherwise) and CovidYears dummy.

The ESG performance of firms could be for reasons including country policy. This would mean before the COVID-19 pandemic, the performance of firms already differs across borders due to economic and social characteristics and interests. To this effect, the role of the ESG performance of firms and lockdown containment approach on firm sales, profitability and valuation is explored. The model is based on equation (2) but with the addition of the interaction term $ES_i \times CountryTreated$, where *CountryTreated* is a dummy variable that is equal to 1 if a firm is in any of the countries that had lockdown treatment during the year 2020 or zero otherwise. The model is re-estimated by replacing ES_i with the E_i and S_i pillar scores.

Finally, the impact of the lockdown on the financial performance and valuation of firms is considered by evaluating the post-lockdown ESG scores' effect on firm performance is considered in this study. The analysis is done on the 2020 and 2021 sub-sample periods in which a dummy variable *PostLockdownYear* is 1 for observations in the year 2021 and zero for 2020 observations.

4 Empirical Results

4.1 Descriptive statistics

Table 1 shows the summary statistics and the covariance matrix for the variables in this study. As shown in panel A, the ES score is 47.14 on average with the environmental and social pillar scores having an average of 42.61 and 51.52 respectively. Comparable mean and standard deviation statistics of ESG firms only is provided in the last two columns with asterisks (*). The most notable difference from the overall sample is the positive and higher average return on assets of the ESG firms. In panel B, the correlation coefficients of all continuous variables are presented. The ES score and individual pillar scores' correlation with return on assets (a measure of profitability) are positive while a negative correlation exists between these variables and Tobin's Q (a measure of valuation). Most variables have less than a 0.90 Pearson correlation coefficient except for the correlation of the environmental and social scores with the weighted average ES scores. This shows that no multicollinearity exists between variables (Hair et al., 2006).

Insert Table 1 approximately here

To show the performance of firms over time, especially during the COVID-19 years in the sample, a graph of the equally-weighted average of the E and S score (i.e. ES score) for firms in the different countries is plotted. In Figure 1, it is visible that overall, the ES[9] performance of firms has been declining for firms in most of these countries except Denmark and there was even deeper performance between 2019 and 2020. However, the positive is that the graph shows a slight upward improvement or at least less steep in 2021 (when most companies are recovering from the shock of the COVID-19 hit).

4.2 The treatment effect of lockdown on firm performance

This study looks at the effect of the external shock (lockdown) on the revenue, profitability, and sustainability performance of firms during COVID-19 using the difference-in-difference approach to separate treated firms (i.e. firms in countries that had lockdown during 2020) from untreated firms (i.e. firms in Sweden

[9] The graph is not different when the governance score is included in ESG performance plot.

without any pronounced lockdown during 2020).

The results in Table 2 show that there's a significant difference in firm revenue in countries with lockdown and those without a lockdown during the COVID year 2020 in models with or without industry controls. The treatment effect has an impact on firm revenue from sales during the lockdown. This means despite restriction of movement that may lead to fewer sales (revenue) due to lower patronage, especially for firms in industries that require physical presence (e.g. leisure, Airlines), customer loyalty as the customer preference suggests may override the inability of customers to patronize their preferred businesses (sustainable firms) as often. Similarly, in models 3 and 4, the difference in the profitability of firms in countries with and without lockdowns during the pandemic is considered. There is a significant difference between firms in countries with lockdown treatment and those without.

Insert Table 2 approximately here

Table 3 presents the result of the difference in firms' Environmental and social performance in lockdown and no-lockdown countries during COVID-19. The intuition is to examine if as pointed by He and Harris (2020), firms are using the pandemic as an opportunity to tackle important environmental and social issues through more investment in related issues. The result of the difference-in-difference analysis on the treatment effect of lockdown on the equally-weighted average of the environmental and social pillar scores (ES) shows no significant difference in sustainability performance (captured in ES scores) of firms in countries with lockdown and those in countries without lockdown. To avoid the influence of industry differences, the model is re-estimated to include industrial control, and the same evidence is found as shown in model 2. In models 3 to 6, similar analyses with and without industry control are carried out on the environmental and social pillar scores of ESG. The result shows that only the social pillar of ESG is significantly different for firms in countries with lockdown when compared with firms in Sweden that is without any defined movement restriction during the year.

Insert Table 3 approximately here

4.3 Role of sustainability in firm performance during a crisis

In order to understand the link between the environmental (E) and social (s) performance of firms and the revenue from sales during the COVID-19 pandemic, this study estimates the interaction effect of the E and S score and COVID-years on firm sales. The result is presented in table 4. As visible in models 1 to 6,there's a positive and significant influence of firms' E and S performance on during and before the COVID-19 pandemic. This implies that firms are encouraged to continue in there strive for more sustainable approach to operations and related issues even under stringent economic conditions. A closer look at the impact of ESG score relevance is presented in model 7. Here the study tests the difference between firms with ESG and those without ESG scores' revenue generation during the COVID-19 pandemic. The result shows that having ESG scores is associated with significantly higher revenue during the pandemic.

Insert Table 4 approximately here

Next, the a similar analysis as in table 4 is carried out on firm profitability. This is to ascertain if increased revenue generation associated with ESG scores translates to profit and profitability of the firm. The result of this examination is presented in Table 5. The equally-weighted average environmental and social (ES) score is positively related to firm profitability in models 1 and 2 with industry or country-fixed effects. The models 3 to 6 estimating the pillar scores (Environmental and social) show similar relations. In model 7, a comparison of ESG and non-ESG firms shows that ESG firms have higher financial performance when compared with non-ESG firms during the COVID-19 years.

Insert Table 5 approximately here

A repeat of similar analyses using the measure of firm valuation (Tobin's Q) is done. The result in Table 6 shows that sustainability (in both pillar scores and the weighted average, ES scores) is positively enhancing firm valuation during the COVID-19 pandemic. Our result suggests that in times of market uncertainty, this non-financial performance measure i.e. ESG provides stakeholders with a useful tool for informed decisions. In addition, as shown in model 7, comparing ESG and non-ESG firm valuation during COVID-19 shows that

ESG ratings improve the valuation of the firms with environmental and social performance.

Insert Table 6 approximately here

5 Discussion

The positive and significant difference in firm financial performance in lockdown against no lockdown countries could be an indication that other factors (ESG) related to firm existence is important in firm performance. According to Dai et al. (2020), a firm's reaction to uncertainty matters in ensuring good performance and such reactions include CSR investments. Similarly, Albuquerque et al. (2020), showed that the COVID-19 pandemic is a unique (health) crisis that differs from the typical (financial) crisis and indicated that other activities that are valued by stakeholders including environmental and social performance can stair the firms out of stiff financial environment. Invariably, the lockdown treatment is an exogenous shock from a health crisis that may be influenced by other factors that can economically steady the performance of firms even with little time to respond to the crisis's challenges, including adjusting the business models where possible or leveraging on other non-financial performances such as social responsibility. To this effect, this study tests next, the significant difference in the environmental and social performance of firms during the lockdown year of the COVID-19 pandemic in order to identify possible driver of the financial performance for firms in lockdown countries.

The COVID-19 pandemic had a social and economic impact on the world. The environmental impact during the pandemic is not has significant. As such, more investment went into social issues (including the workforce, human rights, community, and product responsibility) of firms as much as the environmental. Thus, it is reasonable to see that firms especially those in countries with lockdown do more activities to support their employees and the community during the COVID-19 pandemic. Such employee supports can be e.g. the provision and support for work-life balance like remote working. Though our approach is different, the significant difference in treatment effect support findings that documents higher sustainability to be associated with better performance during COVID-19 (c.f. Pástor and Vorsatz, 2020) and the conclusion that SRI funds outperform conventional funds during the crisis (c.f. Nofsinger and Varma, 2014). This is because

the consumer preference and loyalty theory suggest that firms' activity in ESG is a product differentiation strategy capable of ensuring lower price elasticity of demand, especially in tightened economic situations. Overall, the finding supports the conclusion of Qiu et al. (2021), that firms can use the pandemic as a n opportunity to transform their CSR initiatives.

Michael (1980) opined that there is the tendency for firms to reward revenue performance where a 'prospector' business strategy is followed. The 'prospector' strategy is based the keen interest of firms to lead through new product development and innovation. This gains them significant market share that translates to increased sales. Thus, the positive and significant impact of the environmental and social performance of firms which has key elements such as innovation, product responsibility on revenue can be understood from this prospector's perspective. More recently, studies have identified issues including innovative capabilities, apt customer service, CSR and environmental performance as important factors for firms' enhancing their sales (Ahmad et al., 2021; Li et al., 2020). The resulting effect of the firm's activities in these factors is a successful competitive advantage developed and sustained through innovation (Rauter et al., 2019). Though increasing sales from new products and services or frequency of new product lunch has been a measure of firm innovative performance (c.f. Sofka and Grimpe, 2010), it is not an all informative measure since revenue is not directly amounting to profit or value to company and shareholders. Thus, it is important to consider general performance outlook such as profitability and valuation (Canh et al., 2019).

Corporate social responsibility (CSR) and now ESG has been said to be capable of influencing customers' opinion (e.g., Wang, 2020; Yuen et al., 2016) and eventually loyalty (e.g., Aramburu and Pescador, 2019; Inoue et al., 2017) brands and companies. Similar to Albuquerque et al. (2020) study evaluating ES performance impact on stock returns during the COVID-19 pandemic, this study confirms the customer loyalty importance with the positive relationship of the environmental and social with profitability. This is based on the conclusion that firms can charge relatively higher prices for goods or services as a result of lower price elasticity of demand. This is a result of firms' investment in ESG as a product differentiation strategy. In addition, the result of comparison in firms' profitability due to ESG reporting confirms the assertion of Albuquerque et al. (2019) that the ESG activities of firms are a product differentiation strategy capable of delivering improved financial performance this study documents significantly higher profitability in firms with ESG scores during the COVID-19 pandemic. This result is contrary to the finding of Hu and Zhang (2021) which suggests a drop in the average ROA of firms as the number of COVID-19 cases skyrockets.

However, the finding in this study aligns with studies (e.g., Statman, Glushkov, et al., 2009; Torugsa et al., 2012) emphasising a positive impact of CSR on firm profitability.

Similarly, the significant impact of firm environmental and social performance on firm valuation is consistent with the findings of Hwang et al. (2021) that investment in social capital creates trust and bonds between firms and stakeholders. This informs an investment preference for shareholders as stressed by Heinkel et al. (2001), that SRI (that can be likened to ESG) investors are less likely to flee the market when others do thereby keeping the price of ESG stocks relatively stable. The improved valuation shown in firm with environmental and social scores as those without during the COVID-19 pandemic strengthens the conclusion of Bollen (2007), suggesting that there is less sensitivity in crisis for investors with a preference for ESG stocks. The conclusion stems from the documented evidence that SRI funds out-perform when compared to conventional mutual funds. Investors can value firms highly where high performance is shown in ESG issues as studied (c.f. Jackson and Singh, 2015) documents a boost in revenue for companies that are successful in resolving environmental challenges. Specifically, ESG rating sets firms apart from their counterparts without ESG ratings for reasons including responsibility and economic performance.

6 Test of robustness and additional consideration

In a bid to isolate the impact of lockdown on ESG firms' performance, this study compares the relationship between the environmental and social scores and the performance of firms in the countries with and without lockdown. The result of this analysis is presented in Table 7. Though statistically insignificant, the economic significance of the result shows that the weighted average of environmental and social (ES scores) and social pillar scores of firms in countries with lockdown treatment during COVID-19 are decreasing profitability. This finding is contrary to the assumption that consumer preference for ESG (sustainable) products allows are attributed to customer inelastic demand that allows these firms to charge relatively higher prices. The result is not surprising given that movement restriction is country-wide, affecting customer visits to shops or service outlets and as such, the cost of ESG activities is not immediately repaid in customer patronage through sales and revenue. In addition, the social activities including community and employee support during the lockdown year are enormous and can temporarily drive down the financial performance of firms

that are already strained.

However, it is encouraging to see that firms' activities especially in the social pillar of ESG are rewarded with an improved firm valuation during the lockdown year of COVID-19. This implies that investors value such practices even more during the COVID-19 crisis and especially in countries where there's a lockdown. These could be due to two reasons. First, firms with better social scores during this period are viewed as responsible by investors, particularly as the COVID-19 and lockdown spread containment measures affected the health and economic conditions of people. Thus the support by companies to e.g. employees and the community is not unnoticed by investors. Second, investors' assessment of such companies is that they demonstrate invaluable goodwill during a tough atmosphere imposed by lockdown despite reduced earnings as shown in ESG and profitability relationship. Generally, our result supports Hartzmark and Sussman (2019) claim that there are non-pecuniary motives (such as rationale that stems from an individual's commitment to the environment, and social issues) as well as the guarantee of better risk-adjusted return for stakeholders in sustainable firms.

Insert Table 7 approximately here

Similarly, the severity of COVID-19 is felt in the year 2020 due to lockdown imposed in various countries across the globe. The pandemic was still affecting the health of people and the economy though at a slower pace that allows for adjustment and recovery in the year 2021. This study examines the impact of firm sustainability at the beginning of recovery(Year 2021) for businesses. In this sub-sample analysis, estimations of the interaction between environmental and social performance and a dummy variable that is 1 for firm data in the year 2021 are carried out. The result as shown in Table 8 suggests the sustainability performance firm is positively related to firm profitability in the recovery year 2021. Though the result is not statistically significant, the positive relationship is an improvement on the negative relationship that exists during the lockdown as shown in Table 8. The result of our models evaluating the relationship between the ES performance of firms and valuation is not different from the relationship in the lockdown year.

Insert Table 8 approximately here

7 Summary and conclusion

Since the start of 2020 when the COVID-19 pandemic broke out, the world has witnessed a change in how human activities are carried out. Individuals have adjusted how they interact with each other, firms have redefined their businesses to accommodate the need for reduced contacts and the government has initiated a policy to save life and the economy. Despite the adjustments, all of these agents (individuals, firms, and governments) have struggled to cope with the crisis in aspects that concern them, be it depression for isolated individuals, firms' earnings struggle, or the strained economy that is imposed by lockdown measures of the government in times of the increasing number of infection cases.

This study examines the treatment effect of lockdown on the financial and non-financial performance of firms using data on publicly listed firms in the Nordic countries between 2017 and 2021. This study contributes to the knowledge of the impact of a crisis especially one that is not economical to firm performance. Our study provides rare information on the impact differences of the shock imposing treatment of lockdown on most economies during the first months of the COVID-19 outbreak. This paper explores the significance of firms' sustainability in mitigating or limiting the impact of the crisis during the COVID-19 year.

This study document evidence that the lockdown treatment is a healthcare crisis that may as well improve firm performance where corporate social responsibilities are the highest. Thus, firm sustainability is positively related to the lockdown treatment. This implies that in countries where lockdown was implemented, firms are found to have increased social activities captured in the social pillar scores of ESG during the lockdown. This is particularly positive given the importance of social support required during the pandemic, especially in the lockdown countries where many residents lost jobs and others took pay cuts as well as financial and material support to communities.

Generally, the results of this study support the earlier findings that suggest sustainable firms have resilience in times of crisis as it established that these firms have relatively better financial performance and increased valuation during the COVID period. These are the conclusion of Hwang et al. (2021) and Albuquerque et al. (2020) that supports the ability of sustainable firms to charge relatively higher prices due to the in-elasticity of customer demands as a result of loyalty to socially responsible brands. Similarly, sustainable firms enjoy higher or at least stable valuations due to investors' preference for ESG stocks which are said to have less investor exit during the crisis due to the guarantee of better risk-adjusted return for investors (Hartzmark

& Sussman, 2019).

However, there are a few limitations to this study. First, ESG ratings are annual data that do not allow for monthly or quarterly analysis. Hence, the data does not allow for exact period analysis that e.g. could take care of the exact months or quarters of lockdown in countries. Nevertheless, this study provides a good measure of the disruption in earnings that can affect firm performance. Second, the COVID-19 pandemic saw firms receive support funds from the government. It is unclear which firms receive what and these could possibly affect firms' operations and in turn performance though it is believed that most supports goes to small and medium enterprises of which are very few in our sample. A good suggestion for future research will be a study that considers the performance of firms during the recovery years beyond 2021 when activities have returned to 'normal' in economies across the world. In addition, the effect of COVID-19 on firms' capital structure will be interesting to research.

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Figure

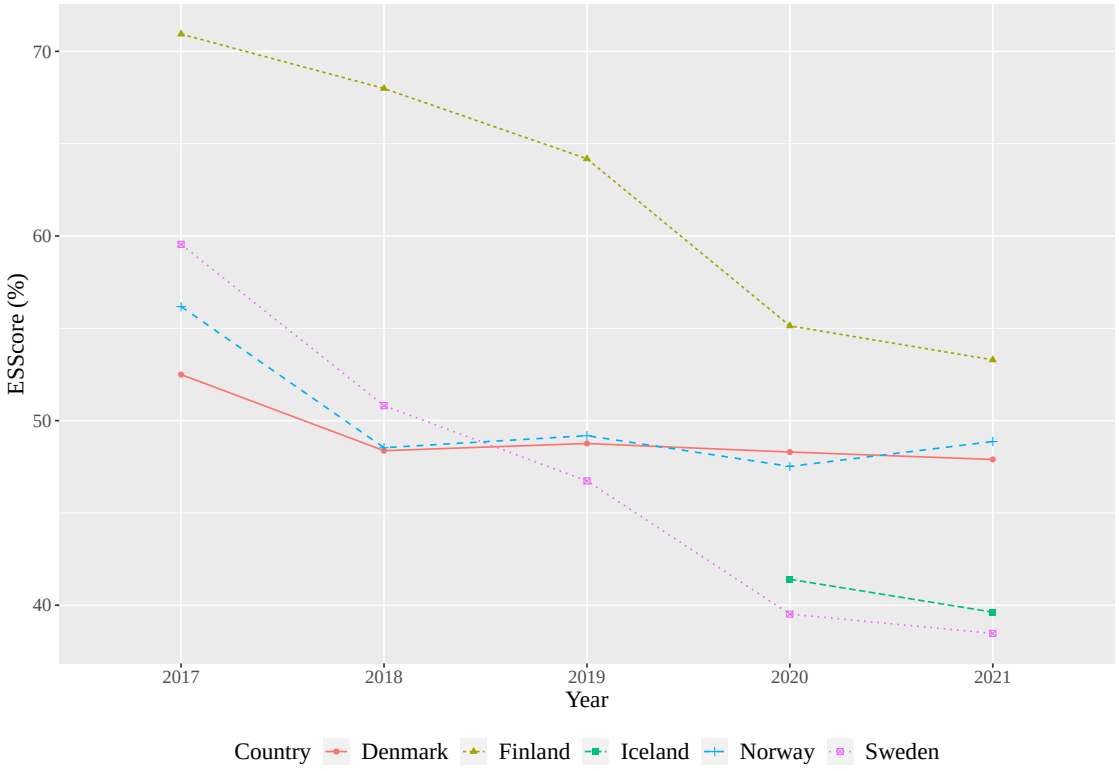

Figure 1: ES Score performance of firms by country 2017-2021 .

Tables

Table 1: Sample descriptive statistics and correlation matrix

This table shows the descriptive statistics (Number of observations, mean, standard deviation maximum, and minimum), mean and standard deviation of ESG firms in the columns with an asterisk (*) and the Pearson correlation matrix of sustainability variables: environmental, social, as well as the average of the environmental and social scores combined and the financial variables: Return on assets (ROA), Tobin's Q, Size (Natural log of total assets), Leverage, Cash Holding, Tangibility, and LnSales (Revenue).

Panel A: Descriptive Statistics

	N	Mean	St. Dev.	Min	Median	Max	Mean*	St. Dev.*
ES	1,699	47.144	23.949	0.458	47.000	95.000	47.144	23.949
Env	1,693	42.612	27.271	0.000	40.655	98.480	42.612	27.271
Soc	1,724	51.521	23.667	0.600	53.115	95.954	51.521	23.667
Ln(Tobin's Q)	5,304	1.032	1.226	−5.528	0.670	12.730	0.682	0.798
ROA	5,279	−0.114	0.575	−31.527	0.011	1.562	0.037	0.155
Firm Size	5,769	18.275	2.768	7.754	18.173	27.089	20.866	2.080
Leverage	2,571	0.012	0.227	−1.743	0.003	10.985	0.018	0.300
Cash Holding	2,821	13.719	718.635	−0.019	0.097	38,169.090	0.146	0.201
Tangibility	3,006	0.731	30.266	0.000	0.087	1,659.526	0.201	0.218
LnSales	5,124	17.277	3.250	−0.015	17.644	25.450	19.984	2.216

Panel B: Pearson correlation matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)ES									
(2)Env	0.948^{***}								
(3)Soc	0.930^{***}	0.765^{***}							
(4)Ln(Tobin's Q)	-0.216^{***}	-0.226^{***}	-0.184^{***}						
(5)ROA	0.182^{***}	0.158^{***}	0.182^{***}	-0.189^{***}					
(6)FirmSize	0.634^{***}	0.620^{**}	0.572^{***}	-0.525^{***}	0.358^{***}				
(7)Leverage	0.002	−0.012	0.020	−0.027	−0.026	0.015			
(8)CashHolding	-0.259^{***}	-0.258^{**}	-0.237^{***}	0.398^{**}	-0.370^{***}	-0.099^{***}	−0.008		
(9)Tangibility	0.181^{***}	0.202^{**}	0.134^{***}	-0.219^{***}	0.069^{***}	-0.091^{***}	0.051^{**}	0.021^{***}	
(10)LnSales	0.679^{**}	0.637^{**}	0.642^{***}	-0.497^{*}	0.523^{***}	0.853^{***}	0.004	−0.447	0.250^{***}

Table 2: Firm revenue and profitability in lockdown vs no-lockdown countries

This table shows the results of a difference-in-difference analysis on firm profitability and valuation in countries during the COVID-19 pandemic with the lockdown treatment effect. LnSales is the revenue generated by the firm from sales in a year and ROA is net income over the total assets of the firm. Lockdown is a treatment dummy that takes 1 if a firm belongs to one of the countries that had a lockdown during the COVID-19-year 2020 and zero otherwise and CovidYears is a time dummy that takes 1 for the year there was a lockdown (2020) and zeroes otherwise. Lockdown × CovidYears is the interaction diff-in-diff analysis that shows the treatment effect. Firm Size is the natural logarithm of the book value of total assets of a firm, Leverage is the debt-to-equity ratio of the firm, Cash Holding is cash, and short-term investment over total assets in percentage, Tangibility is tangible assets (property, plant, and equipment) over total assets in percentage and GDP growth is the change in GDP in a country. The last rows include the industry control, the number of observations in the models estimated, and adjusted R^2. Firm-level clustered standard errors are given in parentheses and *** (**, *) denotes significance at the 1% (5%, 10%) level (two-sided test).

	LnSales		ROA	
	(1)	(2)	(3)	(4)
Lockdown	−0.0001	0.103*	−0.022**	−0.007
	(0.075)	(0.060)	(0.011)	(0.011)
CovidYears	0.213***	−0.233***	0.032**	−0.027***
	(0.074)	(0.056)	(0.012)	(0.012)
Lockdown×CovidYears	0.413***	0.209**	0.123***	0.056***
	(0.112)	(0.085)	(0.018)	(0.018)
Firm Size	0.899***	0.899***	0.025***	0.030***
	(0.014)	(0.014)	(0.002)	(0.002)
Leverage	−0.018	−0.018	−0.034**	−0.027*
	(0.103)	(0.103)	(0.015)	(0.015)
Cash Holding	−1.601***	−1.601***	−0.229***	−0.130***
	(0.156)	(0.156)	(0.024)	(0.027)
Tangibility	0.174	0.174	−0.068***	0.009
	(0.130)	(0.130)	(0.020)	(0.030)
GDP Growth	2.377***	2.377***	0.431***	0.289**
	(0.774)	(0.774)	(0.120)	(0.119)
Constant	1.628***	1.628***	−0.443***	−0.491***
	(0.288)	(0.288)	(0.044)	(0.060)
Industry control	No	Yes	No	Yes
Observations	2,003	2,003	1,806	1,806
Adjusted R^2	0.752	0.860	0.179	0.231

Table 3: Firms' ESG performance during the COVID-19 crisis

This table shows the results of a difference-in-difference analysis considering the impact of lockdown on a firm's ES performance. ES is the equally-weighted average score of the environmental (Env) and social pillars (Soc). Lockdown is a treatment dummy that takes 1 if a firm belongs to one of the countries that had a lockdown during the COVID-19-year 2020 and zero otherwise and CovidYears is a time dummy that takes 1 for the year there was a lockdown (2020) and zeroes otherwise. Lockdown × CovidYears is the interaction diff-in-diff analysis that shows the treatment effect. Firm Size is the natural logarithm of the book value of total assets of a firm, Leverage is the debt-to-equity ratio of the firm, Cash Holding is cash, and short-term investment over total assets in percentage, Tangibility is tangible assets (property, plant, and equipment) over total assets in percentage and GDP growth is the change in GDP in a country. The last rows include the industry control, the number of observations in the models estimated, and adjusted R^2. Firm-level clustered standard errors are given in parentheses and *** (**, *) denotes significance at the 1% (5%, 10%) level (two-sided test).

	ES		Env		Soc	
	(1)	(2)	(3)	(4)	(5)	(6)
Lockdown	0.003	0.003	0.013	0.014	−0.006	−0.007
	(0.016)	(0.016)	(0.019)	(0.019)	(0.016)	(0.016)
CovidYears	−0.011	−0.011	0.005	0.004	−0.023	−0.023
	(0.014)	(0.014)	(0.017)	(0.017)	(0.014)	(0.014)
Lockdown×CovidYears	0.031	0.030	0.018	0.017	0.043**	0.043**
	(0.020)	(0.020)	(0.024)	(0.024)	(0.021)	(0.021)
Firm Size	0.085***	0.085***	0.092***	0.092***	0.078***	0.078***
	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)
Leverage	0.007	0.007	−0.008	−0.010	0.023	0.023
	(0.015)	(0.015)	(0.018)	(0.018)	(0.016)	(0.016)
Cash Holding	0.033	0.038	0.022	0.034	0.035	0.033
	(0.028)	(0.029)	(0.034)	(0.035)	(0.029)	(0.029)
tangibility	0.006	0.005	0.061**	0.059**	−0.054**	−0.053**
	(0.024)	(0.024)	(0.028)	(0.028)	(0.024)	(0.024)
GDP Growth	0.304**	0.301**	0.311*	0.304*	0.291**	0.293**
	(0.137)	(0.137)	(0.165)	(0.165)	(0.143)	(0.143)
Constant	−1.267***	−1.280***	−1.481***	−1.514***	−1.059***	−1.053***
	(0.065)	(0.066)	(0.078)	(0.079)	(0.067)	(0.068)
Industry control	No	Yes	No	Yes	No	Yes
Observations	1,238	1,238	1,238	1,238	1,250	1,250
Adjusted R^2	0.466	0.466	0.422	0.424	0.399	0.399

Table 4: ESG performance impact on firm revenue during the COVID-19 pandemic

This table shows the results of the models' estimation of firms' Environmental and Social performance relationship with Sales during the COVID-19 pandemic. LnSales is the natural logarithm of total sales of a firm i in year t. The main explanatory variables are the individual pillar scores (environmental and social) of ESG and ES is the equally-weighted average score for the environmental and social pillars. The Env, Soc, and ES coefficients are scaled up by 100 for reporting. ESGFirm is a dummy that is 1 if a firm has an ESG score during the period in our sample or zeros otherwise. CovidYears is a dummy variable that takes 1 for COVID-19 years 2020 and 2021 and zeroes otherwise. The control variables; Firm Size is the natural logarithm of the book value of total assets of a firm, Leverage is the debt-to-equity ratio of the firm, Cash Holding is cash, and short-term investment over total assets in percentage, Tangibility is tangible assets (property, plant, and equipment) over total assets in percentage and GDP growth is the change in GDP in a country. The last rows include the fixed effects, the number of observations in the models estimated, and adjusted R^2. Country and firm-level clustered standard errors are given in parentheses and *** (**, *) denotes significance at the 1% (5%, 10%) level (two-sided test).

	LnSales						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ES	0.974***	1.262***					
	(0.202)	(0.237)					
Env			0.765***	0.741***			
			(0.201)	(0.171)			
Soc					1.382***	0.804***	
					(0.235)	(0.199)	
ESGFirm							0.128***
							(0.032)
CovidYears							0.009
							(0.055)
ES×CovidYears	0.587***	0.834**					
	(0.214)	(0.277)					
Env×CovidYears			0.602**	0.369**			
			(0.241)	(0.185)			
Soc×CovidYears					0.630**	0.549**	
					(0.281)	(0.220)	
ESGFirm×CovidYears							0.126**
							(0.059)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	No	No	Yes	No	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	No	No
Observations	1,017	1,017	1,017	1,017	1,029	1,029	1,806
Adjusted R^2	0.163	0.114	0.115	0.164	0.135	0.167	0.125

Table 5: ESG performance impact on firm profitability in the COVID-19 pandemic

This table shows the results of the models' estimation of firms' Environmental and Social performance relationship with profitability (ROA) during the COVID-19 pandemic. ROA is net income over the total assets of the firm. The main explanatory variables are the individual pillar scores (environmental and social) of ESG and ES is the equally-weighted average score for the environmental and social pillars. The Env, Soc, and ES coefficients are scaled up by 100 for reporting. ESGFirm is a dummy that is 1 if a firm has an ESG score during the period in our sample or zeros otherwise. CovidYears is a dummy variable that takes 1 for COVID-19 years 2020 and 2021 and zeroes otherwise. Firm Size is the natural logarithm of the book value of total assets of a firm, Leverage is the debt-to-equity ratio of the firm, Cash Holding is cash, and short-term investment over total assets in percentage, Tangibility is tangible assets (property, plant, and equipment) over total assets in percentage and GDP growth is the change in GDP in a country. The last rows include the fixed effects, the number of observations in the models estimated, and adjusted R^2. Country and firm-level clustered standard errors are given in parentheses and *** (**, *) denotes significance at the 1% (5%, 10%) level (two-sided test).

	ROA						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ES	0.053*	0.032**					
	(0.028)	(0.015)					
Env			0.130***	0.048**			
			(0.021)	(0.024)			
Soc					0.057***	0.040**	
					(0.025)	(0.012)	
ESGFirm							0.017*
							(0.008)
CovidYears							0.002
							(0.013)
ES×CovidYears	0.089***	0.056*					
	(0.027)	(0.031)					
Env×CovidYears			0.072***	0.081***			
			(0.021)	(0.023)			
Soc×CovidYears					0.049*	0.055**	
					(0.026)	(0.027)	
ESGFirm×CovidYears							0.120***
							(0.020)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	No	No	Yes	No	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	No	No
Observations	1,017	1,017	1,017	1,017	1,029	1,029	1,806
Adjusted R^2	0.163	0.114	0.115	0.164	0.135	0.167	0.125

Table 6: ESG performance impact on firm valuation in the COVID-19 pandemic

This table shows the results of the models' estimation of firms' Environmental and Social performance relationship with firm valuation during the COVID-19 pandemic. Tobin's Q is the market value of the firm divided by the asset replacement cost. The main explanatory variables are the individual pillar scores (environmental and social) of ESG and ES is the equally-weighted average score for the environmental and social pillars. The Env, Soc, and ES coefficients are scaled up by 100 for reporting. ESGFirm is a dummy that is 1 if a firm has an ESG score during the period in our sample or zeros otherwise. CovidYears is a dummy variable that takes 1 for COVID-19 years 2020 and 2021 and zeroes otherwise. Firm Size is the natural logarithm of the book value of total assets of a firm, Leverage is the debt-to-equity ratio of the firm, Cash Holding is cash, and short-term investment over total assets in percentage, Tangibility is tangible assets (property, plant, and equipment) over total assets in percentage and GDP growth is the change in GDP in a country. The last rows include the fixed effects, the number of observations in the models estimated, and adjusted R^2. Country and firm-level clustered standard errors are given in parentheses and *** (**, *) denotes significance at the 1% (5%, 10%) level (two-sided test).

	Ln(Tobin's Q)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ES	0.238*	0.524***					
	(0.133)	(0.117)					
Env			0.381***	0.260**			
			(0.111)	(0.111)			
Soc					0.427***	0.055	
					(0.130)	(0.127)	
ESGFirm							0.059**
							(0.023)
CovidYears							0.078**
							(0.039)
ES×CovidYears	0.346***	0.472***					
	(0.112)	(0.138)					
Env×CovidYears			0.310***	0.313***			
			(0.101)	(0.096)			
Soc×CovidYears					0.494***	0.250**	
					(0.114)	(0.107)	
ESGFirm×CovidYears							0.124***
							(0.014)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	No	No	Yes	No	Yes	Yes
Country FE	No	Yes	Yes	No	Yes	No	No
Observations	1,238	1,238	1,238	1,238	1,250	1,250	2,029
Adjusted R^2	0.400	0.225	0.220	0.401	0.238	0.406	0.237

Table 7: ESG and firm performance in lockdown countries

This table shows the results of the sub-sample (2020 and 2021) models' estimation of firms' Environmental and Social performance relationship with firm valuation during the COVID-19 pandemic in Lockdown vs no-lockdown countries. ROA is net income over the total assets of the firm and Tobin's Q is the market value of the firm divided by the asset replacement cost. The main explanatory variables are the individual pillar scores (environmental and social) of ESG and ES is the equally-weighted average score for the environmental and social pillars. The Env, Soc, and ES coefficients are scaled up by 100 for reporting. CountryTreated is a dummy that is 1 for observations of firms in a country that had lockdown during the year 2020 and zeros otherwise. The last rows include firm-level and country controls (Firm Size is the natural logarithm of the book value of total assets of a firm, Leverage is the debt to equity ratio of the firm, Cash Holding is cash and short-term investment over total assets in percentage, Tangibility is tangible assets (property, plant, and equipment) over total assets in percentage and GDP growth is the change in GDP in a country), the industry fixed effect, the number of observations in the models estimated, and adjusted R^2. Country and firm-level clustered standard errors are given in parentheses and *** (**, *) denotes significance at the 1% (5%, 10%) level (two-sided test).

	ROA			Ln(Tobin's Q)		
	(1)	(2)	(3)	(4)	(5)	(6)
ES	0.080***			0.311***		
	(0.025)			(0.108)		
Env		0.071***			0.313***	
		(0.018)			(0.091)	
Soc			0.056**			0.138
			(0.024)			(0.099)
CountryTreated	0.025	0.013	0.045	−0.187	−0.089	−0.230
	(0.033)	(0.138)	(0.037)	(0.158)	(0.131)	(0.172)
ES×CountryTreated	−0.020			0.431*		
	(0.051)			(0.248)		
Env×CountryTreated		0.002			0.280	
		(0.046)			(0.209)	
Soc×CountryTreated			−0.051			0.480*
			(0.054)			(0.257)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,017	1,017	1,029	1,238	1,238	1,250
Adjusted R^2	0.162	0.164	0.168	0.402	0.403	0.406

Table 8: ESG performance impact on firm recovery post-COVID-19

This table shows the results of the sub-sample (2020 and 2021) models' estimation of firms' Environmental and Social performance relationship with firm valuation during the COVID-19 pandemic in Lockdown vs no-lockdown countries. ROA is net income over the total assets of the firm and Tobin's Q is the market value of the firm divided by the asset replacement cost. The main explanatory variables are the individual pillar scores (environmental and social) of ESG and ES is the equally-weighted average score for the environmental and social pillars. The Env, Soc, and ES coefficients are scaled up by 100 for reporting. PostLockdownYear is a dummy that is 1 for observations of firms' during the year 2021 and zeros for 2020. The last rows include firm-level and country controls (Firm Size is the natural logarithm of the book value of total assets of a firm, Leverage is the debt to equity ratio of the firm, Cash Holding is cash and short-term investment over total assets in percentage, Tangibility is tangible assets (property, plant, and equipment) over total assets in percentage and GDP growth is the change in GDP in a country), the industry fixed effect, the number of observations in the models estimated, and adjusted R^2. Country and firm-level clustered standard errors are given in parentheses and *** (**, *) denotes significance at the 1% (5%, 10%) level (two-sided test).

	ROA			Ln(Tobin's Q)		
	(1)	(2)	(3)	(4)	(5)	(6)
ES	0.116***			0.554***		
	(0.039)			(0.161)		
Env		0.104			0.486***	
					(0.137)	
Soc			0.075**			0.371**
			(0.037)			(0.147)
ES×PostLockdownYear	0.038			0.382**		
	(0.047)			(0.189)		
Env×PostLockdownYear		0.020			0.266	
		(0.043)			(0.164)	
Soc×PostLockdownYear			0.041			0.378*
			(0.049)			(0.193)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	496	496	500	717	717	721
Adjusted R^2	0.245	0.247	0.245	0.375	0.376	0.371