

W kierunku umiędzynarodowienia / Towards internationalization

Stock market performance in the face of external shocks. Does ESG compliance immunize against the pandemic?

Notowania giełdowe w obliczu wstrząsów zewnętrznych.
Czy zgodność działalności firm z zasadami ESG
chroni przed negatywnymi skutkami pandemii?

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Abstract


Purpose: This study explores the link between corporate social responsibility and enhanced stock market resilience during crises. It examines whether adherence to Environmental, Social, and Governance (ESG) principles improves stock performance under economic stress.

Methodology/approach: We use a standard event study with market model estimation to evaluate the impact of the first reported COVID-19 deaths on stock performance for companies in the STOXX Europe 600 and the S&P 500.

Findings: The results show that capital market participants reward ESG performance during crises. Environmental and social factors enhance resilience, while corporate governance does not seem relevant in this context.

Research limitations: The research focuses on the early COVID-19 pandemic stages, potentially missing long-term ESG dynamics. The sample comprises US and European companies, possibly limiting global generalizability.

Practical implications: Understanding the relationship between ESG compliance and stock market resilience is crucial for investors, corporations, and policymakers to make informed decisions in a changing economic environment.

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Originality/value: This study demonstrates that during a pandemic, stock market resilience is driven by strong environmental and social performance rather than corporate governance, using a broad sample of US and European companies to highlight regional differences in ESG impact during crises.

Keywords: COVID-19, ESG, stock market performance, shocks, crisis.

Streszczenie

Cel: Niniejsze badanie analizuje związek między społeczną odpowiedzialnością biznesu a zwiększoną odpornością rynku akcji podczas kryzysów. Pozwala odpowiedzieć na pytanie, czy przestrzeganie zasad środowiskowych, społecznych i ładu korporacyjnego (ESG) poprawia wyniki akcji w warunkach stresu gospodarczego.

Metodologia/podejście: Wykorzystano standardowe badanie zdarzeń z estymacją modelu rynkowego, aby ocenić wpływ pierwszych zgłoszonych zgonów z powodu COVID-19 na wyniki akcji spółek z indeksów STOXX Europe 600 i S&P 500.

Wyniki: Wyniki pokazują, że uczestnicy rynku kapitałowego nagradzają wyniki ESG podczas kryzysów. Czynniki środowiskowe i społeczne zwiększają odporność, podczas gdy ład korporacyjny nie wydaje się istotny w tym kontekście.

Ograniczenia badań: Badanie dotyczy wczesnych etapów pandemii COVID-19, potencjalnie pomijając długoterminową dynamikę ESG. Próba obejmuje spółki amerykańskie i europejskie, co może ograniczać globalne uogólnienie.

Praktyczne implikacje: Zrozumienie związku między zgodnością z ESG a odpornością giełdy ma kluczowe znaczenie dla inwestorów, korporacji i decydentów politycznych w podejmowaniu świadomych decyzji w zmieniającym się środowisku gospodarczym.

Oryginalność/wartość: Niniejsze badanie pokazuje, że podczas pandemii odporność rynku akcji jest napędzana przez dobre wyniki środowiskowe i społeczne, a nie ład korporacyjny, przy wykorzystaniu szerokiej próby spółek amerykańskich i europejskich w celu podkreślenia regionalnych różnic w wpływie ESG podczas kryzysów.

Słowa kluczowe: COVID-19, ESG, wyniki rynku akcji, wstrząsy, kryzys.

Introduction

Since the novel SARS-CoV-2 (COVID-19) virus was first reported in December 2019, the life of the world's population has been mainly determined by pandemic developments. The pandemic and the subsequent government measures impacted social life, while the capital markets were also subjected to an enormous shock. Consequently, investors are expected to increasingly move towards a more responsible investment strategy, with a particular focus on building resilience against future crises (see, e.g., J.P. Morgan, 2020).

A company's sense of responsibility towards its environment is often measured by its ESG score, which values activities from environmental (E), social (S), and governance (G) perspectives (Omura et al., 2021). Based on stakeholder theory, the extant literature provides evidence that a higher level of social responsibility or sustainability leads to superior performance in times of crisis. Omura et al. (2021) attribute this to three key actors. First, companies can differentiate themselves

from their competitors through an increased sense of responsibility, which is rewarded with brand loyalty and recognition value (Albuquerque et al. 2020; Flammer, 2015; Heal, 2005). This, in turn, leads to higher profitability and strengthens resilience during economic downturns (Omura et al., 2021). Second, companies that operate responsibly often have more professional management (Heal, 2005), which may lead to higher productivity and, thus, higher profitability. Finally, previous studies have shown that loyal investors are attracted to responsible companies (Becchetti et al. 2015; Nofsinger, Varma, 2014). These investors have chosen to invest not only for financial reasons but also because of shared values, which create a stronger bond to the company and reduce the propensity to sell shares in times of crisis (Nakai et al., 2016).

Recently, Hartzmark and Sussman (2019) raised the question of whether investors value sustainability by examining mutual fund capital flows. A fund classified as low sustainability results in significant net outflows, while one classified as high sustainability leads to significant net inflows. At the same time, however, they found no evidence that funds with high sustainability perform better (see also El Ghoul, Karoui, 2017, Bauer et al., 2005).

In addition to this discussion, some studies examine whether investors specifically pay attention to corporate ESG performance during economic downturns. Using the example of the COVID-19 lockdown in Wuhan, China, Broadstock et al. (2021) showed that high-ESG portfolios in the Chinese stock market outperformed ESG portfolios over this period (February 3 to March 31, 2020). This result was confirmed based on stock indices and Exchange Traded Funds (ETFs) (Omura et al., 2021). For individual US companies, Albuquerque et al. (2020) found that, in the first quarter of 2020, when the COVID-19 pandemic started to spread and strong government measures were implemented, ESG-strong companies showed higher market returns, lower volatility, and higher margins. They discuss higher customer and investor loyalty in times of crisis. However, these studies had a number of limitations. Broadstock et al. (2021) cannot be considered fully representative due to the focus on the Chinese market and the very strong lockdown measures in Wuhan. Meanwhile, Albuquerque et al. (2020) only analyzed one quarter. Therefore, they are neither able to distinguish between investor and customer reactions nor to attribute the corresponding stock market reaction to specific news or political decisions.

Heyden and Heyden (2021) investigated how stock markets in various countries reacted to the initial stages of the COVID-19 pandemic and to subsequent fiscal and monetary policy responses. They utilized an event-study approach, focusing on data from US and European firms, to examine short-term market reactions to specific COVID-19-related events, like the announcement of the first death and the implementation of policy measures. Their findings indicate that stock markets responded negatively to the first reported death in a country but showed no significant reaction to the announcement of the first case of COVID-19. Additionally, the study revealed that while fiscal policy measures generally had a negative impact on stock returns, monetary policy actions appeared to stabilize the markets. They

suggest that fiscal measures may increase investor uncertainty, which could negatively affect stock prices. We bridge the gap between the research conducted by Broadstock et al. (2021) and Albuquerque et al. (2020) by utilizing an international sample and focusing on capital market reactions. Employing the methodology established by Heyden and Heyden (2021), we incorporate various ESG factors to explore whether adherence to ESG standards significantly impacts stock market performance shortly after the first death in a given region was confirmed.

By applying event study methodology on a sample of US and European companies, we find strong evidence that ESG performance is rewarded by a better/less negative stock market performance after negative news. We can also show that the environmental and social scores strongly impact stock price, while the governance score does not. We attribute this behavior to the fact that the COVID-19 pandemic was not a governance crisis compared to the 2008 financial market or the 2001 dot-com crisis.

The paper contributes to the literature in numerous ways. For the first time, we demonstrate that stock market resilience during a pandemic is led by socially and environmentally sensitive behavior, with no explicit relevance attributed to good corporate governance. These results are based on a broad international sample, not individual countries, and they can reveal significant differences between the US and Europe.

1. Hypothesis development

ESG-compliant companies, i.e., those that integrate ESG considerations into their operational and strategic frameworks, are increasingly viewed as more resilient and sustainable in the face of various challenges (Omura et al., 2021). The COVID-19 pandemic and subsequent economic upheavals provide a stark context in which to examine the performance of ESG-aware companies compared to their less ESG-conscious counterparts.

ESG-compliant companies typically have robust risk management systems in place, addressing a wide array of risks, including environmental impacts, social responsibilities, and governance structures. These companies are often better prepared to handle crises due to their proactive identification and mitigation of risks. For example, strong governance practices can prevent mismanagement and ethical breaches, while environmental sustainability efforts can reduce regulatory and operational risks. This resilience is likely to be reflected in their stock prices, which may exhibit less volatility and decline during crises compared to companies that lack such foresight and preparedness.

In line with Stakeholder Theory, companies with high ESG standards often cultivate greater trust and loyalty among stakeholders, including customers, employees, and investors (Albuquerque et al., 2020; Flammer, 2015; Heal, 2005). During a crisis, this trust can translate into more stable financial performance as stakeholders are more likely to support and engage with these companies. Investors, in

particular, may view ESG-aware companies as safer investments, leading to less severe drops in stock prices. The enhanced reputation and stronger relationships with stakeholders can act as buffers against the adverse impacts of crises, supporting the stability of stock prices.

ESG-compliant companies are frequently at the forefront of innovation and operational efficiency, driven by their commitment to sustainability and social responsibility. Such companies often implement energy-efficient technologies, waste reduction practices, and sustainable supply chain management, which can lead to cost savings and improved operational performance. During a crisis, these efficiencies can provide a competitive edge, allowing ESG-aware companies to maintain profitability and avoid the severe financial impacts that might befall less efficient, non-ESG-compliant companies. This operational advantage can be reflected in more favorable stock price performance.

Adherence to ESG principles can also confer advantages in terms of regulatory compliance and market positioning. ESG-aware companies are often better equipped to navigate regulatory changes and are less likely to face fines, litigation, or reputational damage. Additionally, as consumer and investor preferences increasingly shift towards sustainability, ESG-aware companies may experience higher demand for their products and services. This market advantage can contribute to more stable and possibly even enhanced stock performance during crises.

Based on the theoretical and empirical foundations discussed, we propose the following hypothesis:

H1: During times of crisis, companies that are ESG-compliant exhibit better (or less bad) stock price performance compared to companies that are not ESG-aware.

This hypothesis posits that the integration of ESG factors contributes to a company's resilience and attractiveness to investors, thereby cushioning it against the adverse impacts of crises on stock prices.

2. Methodology and data

We apply standard event study methodology in R using the market model estimation (MacKinlay, 1997) to those companies that constituted the STOXX Europe 600 and the S&P 500 in January 2022. We compute cumulative abnormal returns (CAR) for different event windows around the day of the first reported death in the respective region. Thereby we distinguish between Europe and the US – the first death in Europe was reported in Italy on February 21; the first death in the US was reported on February 29. Inspired by Heyden and Heyden (2021), who investigated capital market reactions to this event in the US and Europe, we set the estimation window to the last 200 trading days of 2019 to avoid any confounding effects of the estimation window with the prelude to the pandemic. The beta estimates (β_i) from the estimation window for company i are multiplied with the market returns (R_{mt}) for the calculation of expected returns (ER_{it}) during the event window by $ER_{it} = \beta_i \times R_{mt}$. By subtracting the daily expected returns from the

observed returns (R_{it}), we obtain the abnormal returns $AR_{it} = R_{it} - ER_{it}$. We receive cumulative abnormal returns (CAR_i) for each company by summing across the days t of the event window $CAR_i = \sum_t AR_{it}$.

The CARs are then explained in an ordinary least squares (OLS) model to measure the impact of ESG compliance on the stock performance around the event day. As an indicator for ESG compliance, we apply Refinitiv Eikon's ESG score and its subcomponents E (environmental score), S (social score) and G (governance score), given in a range from 0 to 1.

Large and profitable companies typically possess the financial resources required to establish an ESG process structure. Additionally, they benefit from economies of scale that allow them to manage these processes cost-effectively. As such, the size and profitability of a company not only directly enhance its resilience during crises—an effect that is readily apparent—but also improve its ability to comply with ESG standards. Financial stability further supports this capability by influencing a company's refinancing options. This, in turn, bolsters resilience through additional borrowing and provides financial flexibility to meet ESG compliance.

Consequently, we incorporate established standard control variables to account for these company characteristics like firm size as logarithmized assets (LN_ASSETS), profitability as profit margin ($PROF$) and return on equity (ROE), and market-to-book ratio (MTB) (Heyden, Heyden, 2021; Ramelli, Wagner, 2020). The ratio of tangible assets (TAN) (e.g., Hackbarth et al., 2015), the liquidity ratio (LIQ) (e.g., Bates et al., 2009), as well as the leverage ($TLEV$), affect firm performance, especially during economic downturns (e.g., Opler, Titman, 1994). Considering prior research, we further include the dividend yield (DY) and volatility ($VOLA$) into our model (Ang et al., 2006; Haugen, Baker, 1996). Due to its characteristics as a proxy for the availability of shares to be short-sold, we include the percentage of shares held by institutional shareholders ($INST$) (Asquith et al., 2005; D'Avolio, 2002; Nagel, 2005). All controls, except the logarithmized assets, are winsorized at the 5th and 95th percentiles. We further use the binary variable *Region US* to distinguish between the USA and Europe. In this way, we take into account both the temporally different occurrences of the first COVID-19 death and possible different reactions to this case. Last but not least, we include industry effects since it is well known that some industries suffered due to COVID-19 while others gained. Equation 1 shows the econometric model of our baseline model (1):

$$\begin{aligned}
 CAR_i = & \alpha + \beta_1 \times ESG\ Score_i + \beta_2 \times LN_ASSETS_i + \beta_3 \times PROF_i + \beta_4 \\
 & \times ROE_i + \beta_5 \times MTB_i + \beta_6 \times TAN_i + \beta_7 \times LIQ_i + \beta_8 \\
 & \times TLEV_i + \beta_9 \times DY_i + \beta_{10} \times VOLA_i + \beta_{11} \\
 & \times INST_i + \beta_{12} \times Region\ U.S. + \beta_{13} \times Industry + \varepsilon_i
 \end{aligned} \tag{1}$$

In addition, we compute five further models. Our Model (0) omits the ESG score as a predictor in order to replicate the results of Heyden and Heyden's (2021) as closely as possible. By doing so, we check our methodology for consistency against the prior literatures' results. Despite individual deviations in the methodology and

the sample, we can confirm Heyden and Heyden's main results. To determine if there is a particular component of the ESG score that has a significant impact on stock performance by itself, we replace the ESG score with the environmental score in Model (2), with the social score in Model (3), and with the governance score in Model (4). Model (5) depicts an interaction effect between the ESG score and ROE to test whether the ESG score affects the ROE and, thus, indirectly influences stock performance. To prevent problems with heteroskedasticity, all models were computed with robust standard errors. The highest VIF observed is 2.86. Thus, multicollinearity can be excluded, and stable regression models are assumed. In the case of model (5), we applied the Holm correction for multiple testing due to the inclusion of the interaction effect. However, the significance statements did not change.

We retrieve all data from the Refinitiv Eikon Database. Of the 1,106 constituents of the two stock indices, we were able to obtain 845 complete data sets, which will provide the basis for our analysis. The sample composition is presented in Table 1 and the respective descriptive statistics are shown in Table 2.

Table 1. Sample composition

Industry	EU	US	Sum
Basic materials	54	24	78
Consumer cyclicals	84	70	154
Consumer non-cyclicals	47	36	83
Energy	19	22	41
Healthcare	49	53	102
Industrials	91	66	157
Real Estate	33	7	40
Technology	59	80	139
Utilities	27	24	51
Sum	463	382	845

Note: All companies from the financial sector were removed from the sample.

Source: authors' own elaboration.

Table 1 outlines the distribution of companies across various industries in the European Union (EU) and the United States (US), forming a sample size of 845 companies. Notable disparities exist in sector representation, with the industrial sector having the highest count in both regions (91 in the EU and 66 in the US). At the same time, Real Estate displays a significant difference, with 33 companies in the EU compared to 7 in the US.

This sample is particularly suitable for analysis due to its diverse representation across key industries. It provides a comprehensive and comparative perspective on corporate compositions in the EU and US. Including sectors such as Basic Materials, Consumer Cyclicals, and Technology allows for a nuanced exploration of industry-specific trends. Additionally, the broad international scope of the

sample facilitates the identification of potential regional variations, offering valuable insights for a thorough research study on corporate characteristics and behaviors in the context of the EU and US.

Table 2. Summary statistics

Item	mean	sd	var	min	q1	me- dian	q3	max	IQD
CAR [-1, 5]	0.001	0.074	0.006	-0.416	-0.042	0.004	0.046	0.284	0.088
CAR [-5, 5]	0.006	0.085	0.007	-0.511	-0.032	0.009	0.052	0.518	0.083
ESG Score	0.656	0.160	0.026	0.005	0.559	0.685	0.772	0.938	0.213
Environment Score	0.618	0.235	0.055	0	0.482	0.662	0.799	0.991	0.317
Social Score	0.692	0.190	0.036	0.008	0.564	0.734	0.839	0.983	0.275
Governance Score	0.633	0.192	0.037	0.005	0.501	0.651	0.785	0.985	0.284
LN_ASSETS	23.315	1.404	1.971	17.415	22.357	23.320	24.303	27.036	1.946
PROF	0.119	0.105	0.011	-0.017	0.047	0.093	0.158	0.408	0.111
ROE	0.164	0.153	0.023	-0.127	0.078	0.137	0.229	0.547	0.151
MTB	4.875	4.430	19.627	0.762	1.788	3.294	6.251	17.399	4.463
TAN	0.246	0.201	0.041	0.000	0.088	0.184	0.355	0.700	0.267
LIQ	0.326	0.182	0.033	0.006	0.195	0.306	0.459	0.689	0.263
TLEV	0.616	0.173	0.030	0.282	0.499	0.620	0.740	0.932	0.241
DY	0.022	0.017	0.0003	0	0.008	0.019	0.031	0.059	0.023
Vola	0.256	0.072	0.005	0.100	0.204	0.244	0.299	0.415	0.095
INST	0.642	0.254	0.064	0.004	0.427	0.696	0.862	0.984	0.435

Note: Balance sheet data used to calculate control variables and ESG scores are based on fiscal year 2019 using a cut-off date of June 30, 2020. Market capitalization, dividend yield and percentage of institutional shareholders are based on Dec. 31, 2019, market values.

Source: authors' own elaboration.

The summary statistics provide a comprehensive overview of the 845 companies in the sample, revealing key insights into their financial and sustainability characteristics. On average, the Cumulative Abnormal Returns (CAR) over different intervals ([-1, 5] and [-5, 5]) are close to zero, suggesting minimal abnormal performance. The ESG score averages at 0.656, with environment, social, and governance scores at 0.618, 0.692, and 0.633, respectively, indicating a generally positive sustainability profile. Financial metrics include LN_ASSETS at an average of 23.315, PROF at 0.119, ROE at 0.164, and MTB at 4.875, providing insights into asset levels, profitability, return on equity, and market-to-book ratios. Additionally, measures such as TAN (0.246), LIQ (0.326), TLEV (0.616), DY (0.022), Vola (0.256), and INST (0.642) shed light on tangibility, liquidity, leverage, dividend yield, volatility, and institutional ownership. These statistics offer a robust foundation for analyzing the financial and sustainability dimensions of the studied companies, facilitating a nuanced understanding of their performance and characteristics.

3. Results and discussion

Table 3 shows the results of our models. Panel A shows the results for an event window of one day before the event until five days after it (CAR [-1, 5]), assuming that the report of the first death was unexpected. Panel B shows an event window of five days before until five days after the event (CAR -5, 5], considering that the reporting of the first death was to be expected a few days before the event. Based on the strongly increased model fit and the sudden significance of the constant, it can be assumed that the confirmation of the first death indeed had a surprising effect on the stock markets.

Table 3. Panel A: Dependent variables – cumulative abnormal returns [-1, 5]

Item	<i>Dependent variable:</i> CAR [-1, 5]					
	(0)	(1)	(2)	(3)	(4)	(5)
ESG Score		0.050***				0.056**
		(0.019)				(0.027)
Environment Score			0.038***			
			(0.012)			
Social Score				0.040***		
				(0.014)		
Governance Score					0.010	
					(0.014)	
ESG Score x ROE						-0.037
						(0.103)
Constant	-0.142**	-0.105*	-0.103*	-0.110*	-0.137**	-0.109*
	(0.058)	(0.059)	(0.059)	(0.059)	(0.058)	(0.062)
Region US	-0.034***	-0.029***	-0.032***	-0.030***	-0.033***	-0.029***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
LN_ASSETS	0.006***	0.003	0.003	0.003	0.005**	0.003
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
PROF	0.013	0.014	0.019	0.017	0.011	0.014
	(0.027)	(0.027)	(0.027)	(0.027)	(0.026)	(0.026)
ROE	0.006	0.006	0.004	0.005	0.006	0.031
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)	(0.074)
MTB	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TAN	-0.044***	-0.047***	-0.048***	-0.046***	-0.045***	-0.047***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
LIQ	0.085***	0.079**	0.079***	0.081***	0.084***	0.079***

Item	<i>Dependent variable:</i> CAR [-1, 5]					
	(0)	(1)	(2)	(3)	(4)	(5)
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
TLEV	-0.029*	-0.031**	-0.029*	-0.029*	-0.030*	-0.031**
	(0.016)	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)
DY	0.070	-0.035	-0.025	-0.002	0.050	-0.042
	(0.184)	(0.179)	(0.181)	(0.181)	(0.182)	(0.181)
Vola	0.157***	0.164***	0.169***	0.163***	0.157***	0.164***
	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)	(0.043)
INST	0.022	0.017	0.023	0.020	0.019	0.017
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	845	845	845	845	845	845
R ²	0.202	0.209	0.212	0.209	0.202	0.209
Adjusted R ²	0.183	0.190	0.192	0.190	0.183	0.189

* p < 0.1; ** p < 0.05; *** p < 0.01, standard errors are in brackets

Source: authors' own elaboration.

Table 4. Panel B: Dependent variables – cumulative abnormal returns [-5, 5]

Item	<i>Dependent variable:</i> CAR [-5, 5]					
	(0)	(1)	(2)	(3)	(4)	(5)
ESG Score		0.058***				0.051
		(0.022)				(0.033)
Environment Score			0.036**			
			(0.015)			
Social Score				0.050***		
				(0.017)		
Governance Score					0.016	
					(0.016)	
ESG Score x ROE						0.039
						(0.130)
Constant	-0.056	-0.014	-0.020	-0.016	-0.049	-0.009
	(0.066)	(0.068)	(0.068)	(0.068)	(0.067)	(0.073)
Region US	-0.024**	-0.019*	-0.022**	-0.019*	-0.022**	-0.019*
	(0.010)	(0.011)	(0.010)	(0.011)	(0.011)	(0.011)
LN_ASSETS	0.001	-0.002	-0.001	-0.002	0.001	-0.002

Item	<i>Dependent variable:</i> CAR [-5, 5]					
	(0)	(1)	(2)	(3)	(4)	(5)
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
PROF	0.039	0.042	0.045	0.045	0.037	0.042
	(0.031)	(0.031)	(0.031)	(0.031)	(0.030)	(0.030)
ROE	0.001	0.002	-0.0003	0.0004	0.002	-0.024
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.097)
MTB	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
TAN	-0.033*	-0.036*	-0.035*	-0.035*	-0.034*	-0.036*
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
LIQ	0.102***	0.095***	0.097***	0.097***	0.101***	0.096***
	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)
TLEV	-0.019	-0.022	-0.020	-0.019	-0.022	-0.022
	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.019)
DY	0.101	-0.019	0.011	0.010	0.070	-0.012
	(0.213)	(0.205)	(0.209)	(0.209)	(0.207)	(0.208)
Vola	0.161***	0.169***	0.172***	0.168***	0.160***	0.169***
	(0.048)	(0.048)	(0.048)	(0.047)	(0.048)	(0.048)
INST	0.009	0.003	0.010	0.006	0.004	0.002
	(0.018)	(0.018)	(0.018)	(0.018)	(0.019)	(0.019)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	845	845	845	845	845	845
R ²	0.165	0.173	0.172	0.174	0.166	0.173
Adjusted R ²	0.146	0.152	0.152	0.154	0.146	0.151

* p < 0.1; ** p < 0.05; *** p < 0.01, standard errors are in brackets

Source: authors' own elaboration.

The constant reflects a significant negative unmoderated stock reaction around the reporting of the first death. European markets were strongly negatively impacted, leading to a drop in stock prices of about 10.3–14.2 p.p. for the event window [-1, 5]. Companies listed in the S&P 500 fared much worse, with an additional average decline of around 2.9–3.4 p.p.

The significant positive coefficient for the ESG score in Model (1) shows that ESG-compliant companies suffered less from the above-mentioned downturn of the stocks. Each additional index point of the ESG score led to a 0.050–0.058 p.p. improvement in CAR around the event date for the companies studied – regardless of which event window was selected. This result initially supports our hypothesis that

ESG compliance leads to a certain degree of crisis resilience. Furthermore, based on the numbers, it can be concluded that an immunization strategy should be possible through ESG measures.

From model (5), we can see that the interaction between ESG and ROE is insignificant, so an indirect effect of ESG on ROE and further on CAR cannot be found here. But even when adjusted for the interaction effect, the ESG score remains highly significant. A closer look at the sub-scores shows that not all three ESG categories play an equally important role in the performance of the companies. While the environmental (E) and the social (S) scores are highly significantly positive, the coefficient of the governance (G) score is not significant. The division of the event windows again plays a subordinate role. In all cases, the control variables exhibit the expected behavior and are consistent with available results from the extant literature.

In addition to the hypothesis variables, the strong group difference between the capital market reactions in Europe and the USA is particularly striking. The capital markets in the USA react significantly more negatively to the news of the first death than those in Europe, even without taking ESG criteria into account. Much can be speculated about the reasons for this behavior. However, it is important to note that the first death in the USA was reported eight days after the first European death, so it can be assumed that the severity of the pathogen was already more obvious.

At the time of the events, the annual financial reports for 2019 were only partially available. Nevertheless, it can be assumed that they best reflect the level of information available to the capital market, especially since the pandemic effects may not yet be included in the data. Nevertheless, to check robustness, we repeated the analysis based on 2020 financial statements. The results were confirmed and proved to be robust. It was also observed that, in addition to many other variables, the interaction effect between ESG and ROE, in particular, then became significant. This suggests that investors' initial reaction to the event anticipates the reaction of both customers and the operating business.

To further check for robustness, shorter $[-1, 1]$ and longer $[-1, 10]$ and $[-5, 10]$ event windows were examined for all models. The application of the shorter event windows confirmed our results. A longer event window is usually accompanied by dilution from confounding events and other noise. Accordingly, weaker capital market responses were found. Further, we replaced CAR with Buy-and-Hold Abnormal Returns ($BHAR_i = \prod_t (1 + AR_{it}) - 1$), which are typically used in long-term event studies to account for the compounding of interest effect. As this led to largely identical results, we will not present them here.

Freeman's stakeholder theory (Freeman et al., 2007) offers a possible explanation for the behavior shown. This theory states that ethical and moral aspects and mutual care are necessary to overcome challenging economic periods. Following Albuquerque et al. (2019), companies that demonstrate environmental and social responsibility may develop unique selling propositions, stronger brand awareness, and increased customer loyalty. This, in turn, can lead to lower price elasticity and,

thus, higher profit margins. Our findings strongly suggest that investors also show loyalty towards ESG-compliant companies, potentially anticipating the same loyalty from customers.

Another possible explanation would be that companies with greater social responsibility are more likely to be supported by governments with bailouts in the event of external shocks, which significantly reduces shareholder risk. The “too-big-to-fail” argument thus becomes a “too-social-to-fail” one. In addition, employee engagement can be strengthened through fair wages and good working conditions. This leads to lower staff turnover and can, therefore, be seen as an indicator of maintaining company performance levels during the crisis. Finally, investors who value ESG principles may be drawn to ESG-strong companies not only for financial gain but also due to shared values. This alignment can increase their willingness to hold these shares even in turbulent times.

Good corporate governance, on the other hand, does not seem to play a significant role for market participants during economic downturns. Corporate governance is the legal and factual regulatory framework for managing and monitoring companies for the benefit of all relevant stakeholders. In essence, corporate governance focuses on mitigating principal-agent conflicts at all levels of the company. Thus, no initial responses to a pandemic can be drawn from this theoretical framework. However, a key aspect of corporate governance is how to deal with business risks, in particular, maintaining an appropriate risk management system for the company. As observed in our sample, this does not seem to have convinced shareholders.

Conclusions

The unprecedented challenges posed by the COVID-19 pandemic reshaped global dynamics, influencing public health and the financial landscapes. Amid these shifts, investors are increasingly drawn to responsible investment strategies to fortify the resilience of their portfolios during crises. Our research explored the nexus between Environmental, Social, and Governance (ESG) compliance and stock market performance during a critical event – the confirmation of the first COVID-19 death in specific regions.

Our findings, derived from a robust sample of 845 US and European companies, underscore the significance of ESG performance in shaping stock market reactions to adverse events. Companies with higher ESG scores exhibited more favorable stock market performance, indicating a degree of crisis resilience. This result aligns with stakeholder theory, suggesting that responsible and sustainable business practices foster brand loyalty, customer recognition, and enhanced profitability.

Delving into the subcomponents of ESG, our analysis reveals that both the Environmental and Social scores significantly impact stock prices, while Governance scores do not. This nuanced insight suggests that, in the context of the COVID-19 pandemic, the crisis is not primarily a governance-related issue, which

distinguishes it from past financial crises. The interaction effect between ESG and Return on Equity (ROE) was explored to understand whether ESG affects ROE and stock performance. However, this interaction proved to be insignificant, emphasizing that the direct impact of ESG compliance on stock performance remains substantial even when considering potential indirect effects.

Our research contributes to the literature by being the first to demonstrate that, during a pandemic, socially and environmentally responsible behavior drives stock market resilience, with no explicit relevance attributed to good corporate governance. This insight holds across a broad international spectrum, highlighting notable differences between the US and Europe. The analysis employed a rigorous event study methodology, utilizing cumulative abnormal returns (CAR) around the event day, focusing on investor reactions. The econometric models, which incorporated ESG scores and various control variables, reinforce the robustness of our findings. We account for diverse industry characteristics, financial metrics, and market factors, ensuring a comprehensive understanding of the relationship between ESG compliance and stock market performance during crises.

In conclusion, this research provides compelling evidence that investors recognize and reward ESG compliance during times of crisis, such as the COVID-19 pandemic. The implications extend beyond financial metrics, emphasizing the importance of sustainable and socially responsible business practices in navigating challenging economic periods. As responsible investing continues to gain prominence, understanding the dynamic interplay between ESG compliance and stock market resilience becomes paramount for investors, corporations, and policymakers. The novel and unprecedented COVID-19 pandemic provided us with a unique opportunity to investigate whether a focus on social and environmental responsibility pays off for companies in times of crisis, i.e., whether ESG compliance contributes to increased crisis resilience.

Our results support our hypothesis that ESG performance is generously rewarded by capital markets in such times. In particular, we find that environmental and social concerns are crucial to overcoming the crisis better, while corporate governance aspects are not relevant in this situation. The results even suggest that implementing an immunization strategy through ESG-compliant behavior should be possible.

While our research contributes significantly to understanding the interplay between ESG compliance and stock market performance during the COVID-19 pandemic, several limitations merit consideration. Firstly, the study's focus on the initial phase of the pandemic may not capture the longer-term effects on ESG dynamics. Future research could explore the evolving nature of investor sentiments and corporate responses over extended periods.

Secondly, our sample predominantly encompasses US and European companies, potentially limiting the generalizability of findings to a global context. Diverse regional economic and regulatory landscapes may influence the relationship between ESG compliance and stock market resilience differently.

Furthermore, the study assumes the availability of accurate and timely ESG data, which may not always be accurate. Inaccuracies or delays in ESG reporting could introduce noise into our results. Finally, the research does not delve deeply into sector-specific nuances, warranting future investigations into industry-specific impacts of ESG compliance during crises. Despite these limitations, our findings provide valuable insights into the immediate market responses to ESG performance during unprecedented global challenges.

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