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Responsible investment and stock market shocks: Short-term insurance and persistent outperformance post-crisis?

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Abstract

We investigate the differential effect of the COVID-19 shock to the stock market shock on the share prices of firms with different levels of ESG (Environmental, Social and Governance) scores. Thereby, we analyse whether and to what extent better ESG ratings provided insurance for investors in the stocks of those firms during this shock. We focus our analysis on the European market in which ESG investment plays a particularly important role. Using a broad sample of listed firms we provide mixed evidence. On the one hand, we show that immediately after the start of the shock firms with a higher ESG score outperformed their peers. On the other hand, this effect faded less than six weeks later. Given the quick recovery of the market our finding supports the idea that ESG stocks provide limited insurance in severe crises.

Keywords: Responsible investment, ESG, stock market crisis, persistence

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1 Introduction

Incorporating environmental, social and governance (ESG) measures into investment strategies has become a decisive factor of investment behavior for retail as well as institutional investors.[1] The level and growth of ESG related investment, often also referred as socially responsible (see, e.g., Cheah *et al.*, 2011; Trinks and Scholtens, 2017) or sustainable investment (see, e.g., Liang and Renneboog, 2021; Pástor *et al.*, 2021), has led this investment strategy to become a key force in financial markets. Despite this fact and despite the academic discussion on the motives of firms to engage in such activities (see, e.g., Bénabou and Tirole, 2010; Galbreath, 2010), we still know rather little about how this investment strategy relates to firm performance in stock markets.[2] Recent studies have pointed in different directions. While Hong and Kacperczyk (2009) show that ESG investments are associated with lower financial returns (see also Bolton and Kacperczyk, 2021; Pástor *et al.*, 2021), Edmans (2011) argues in favor of a positive return for ESG factors. Pedersen *et al.* (2021) provide a more nuanced, balanced view. On theoretical grounds McWilliams and Siegel (2001) reinforce this balanced view by stressing that corporate social responsibility (CSR) is most likely to be associated with higher costs as well as higher revenues.

We aim to contribute to this discussion by investigating the stock performance of ESG stocks when being exposed to an unexpected but systematic shock. We particularly rely on the stock market reaction to the COVID-19 pandemic in the Spring of 2020. Thereby, we focus not only on the performance of ESG stocks in a crisis environment but also attach particular weight to a key aspect of ESG investment: the higher potential resilience of ESG firms to a systematic risk factor. Furthermore, paying tribute to the fact that ESG investing is particularly prominent in Europe, we use a sample of European firms to investigate the stock performance during the COVID-19 crisis.

We build on the literature to form hypotheses about the relationship between ESG characteristics of firms and their stock performance during the peak of the COVID-19 crisis as well as afterwards. The literature has identified two channels for why ESG matters for returns during crises. First, management scholars have argued that socially responsibility is one

[1] According to the United Nation's supported Principles for Responsible Investment Initiative global investors with assets under management of more than 100 trillion US-Dollars had committed to the ESG investment approach by 2020. In 2020, current ESG assets under management amounted to close to 40 trillion USD and hence to almost a third of the entire market, with Europe accounting for half of global ESG assets (Bloomberg, 2021).

[2] There is also ample studies on the relationship between CSR and firm operative performance, see e.g. Han *et al.* (2016) and Orlitzky *et al.* (2003).

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of the primary mechanisms through which a firm fosters trusting stakeholder relationships (Barnett and Salomon, 2012). Second, a number of studies have identified the insurance-like aspect of a firm's social responsibility and that of their investors (see Gardberg and Fombrun, 2006; Godfrey, 2005; Godfrey *et al.*, 2009; Kanamura, 2021).

We aim to bring these two hypotheses to the data. In particular, we ask to what extent is investing in socially responsible stocks associated with investors trusting these stocks more in severe crises and hence, are less prone to sell them. We test these mechanisms with the help of stock market developments in the course of the COVID-19 crisis. In particular, we use the initial COVID-19 outbreak as a crisis setting. The COVID-19 outbreak in early 2020 was without doubt a very severe crisis event which has led informed observers such as Carmen Reinhart to claim that "this time it is indeed different" (see Reinhart, 2020). As the initial shock is relatively unrelated to the economy and resulted from anticipated measures taken to combat medical concerns, the COVID-19 crisis represents a more straightforward natural experiment to isolate the non-obfuscated effect of ESG scores than any past slowly unfolding crisis that resulted from economic conditions or financial anomalies (see Albuquerque *et al.*, 2020). We hence use the time of the outbreak of the pandemic in February 2020 as an exogenous crisis event to investigate our hypotheses. In a next step, we investigate the persistence of the potential effects by looking into the relative stock returns of companies with pronounced ESG scores in the longer periods after February 2020.

We find that companies with a one standard deviation higher ESG score are, on average, associated with a 2 percentage points lower reduction in stock returns in the very beginning of the COVID-19 outbreak, that is during the sharp market downturn. We show that these patterns are driven by the E and S factors while the G factors seems to have no effect. The immediate effect which can be observed during the immediate market drop fades away right after this period. Six weeks after the start of the crisis higher ESG scores did not lead to any cumulative abnormal returns. In our analysis we do not only control for firm characteristics, but also industry and country fixed effects as well as Fama-French risk-factors, the momentum factor and factor loadings. Thereby we aim to take other drivers of abnormal returns in the crisis period extensively into account Our results support the hedging hypothesis but also show that there is very little, if any, evidence that ESG investments persistently outperform. Our results indicate that considering stakeholders' interests pays off immediately during crises but not beyond.

We build and contribute to the small amount of studies on the relationship between

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socially responsible investment and crisis resiliency. Lins *et al.* (2017) initiate the discussion by focussing on the effects of the financial crisis, which they characterize as a trust crisis, on the returns of socially responsible investments. They show that the stocks of US firms with high social capital, as measured by CSR intensity, returned 4 to 7 percentage points more than with low social capital. With respect to the analysis of the COVID-19 crisis the few papers available show conflicting results. While Albuquerque *et al.* (2020) use a broad sample of US firms and find that firms with high ES scores outperformed other firms during the COVID-19 crisis, Demers *et al.* (2020) challenge their findings by adding market-based, accounting-based, and other control variables. By doing so, they find non-positive effects of the ES stocks during the COVID-19 crisis for their US firms. Ding *et al.* (2021) use a broad sample of international firms to analyse stock performance during the height of the COVID-19 crisis. Among (many) other things they also show a positive effect of ES characteristics. However, their analysis does not control for traditional market-based measures of risk and other confounding variables that potentially lead to an omitted variable bias (Demers *et al.*, 2020). In line with our argument of stronger investors' preferences for ESG stocks in severe crises Ferriani and Natoli (2020) show that during the COVID-19 crisis investors showed a preference for low ESG-risk funds that indicate they were less inclined to sell assets with strong ESG characteristics. We complement the two former studies by focusing on European firms for which ESG characteristics are more prominent and should be expected to matter more. In addition, rather than by only looking at the immediate consequences of the COVID-19 crisis we also investigate the persistence of potential effects.

The paper is organized as follows. In the next section, we review the related literature which allows us to derive our two main hypotheses. In the third section, we outline our data source as well as the main characteristics of the data and their descriptive statistics. In the fourth section we bring our hypotheses to the data and test the effect of ESG characteristics on stock performance in February 2020 and beyond. The last section concludes.

2 Theoretical Background and Hypotheses

The social responsibility of firms and socially responsible investing is not a new phenomena. In the 1970s an intense discussion and public debate had already taken place; Friedman (1970) fiercely defended the strict position of shareholder value against other scholars who supported the idea of a socially responsible firm (see Barnekov and Rich, 1972; Hay and Gray,

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1974). In the meantime the discussion became more nuanced. Particularly, the analysis of the motivation and detailed strategies behind CSR and socially responsible investments led to new arguments. We explore certain segments of this discussion and derive our hypotheses on the basis of the theoretical (and partially empirical) literature on the relationship between socially responsible investments and their stock performance in crises. It seems helpful to relate the two main terms associated with the social investing and social behavior of firms: CSR and ESG. The main difference is that CSR has a broader scope and lacks comparable data points (see Porter and Kramer, 2006) while ESG incorporates more specific criteria that enables a better quantification of firm's stakeholder commitment (for a critical view see Berg *et al.*, 2019). This quantification leads us mainly to the use of ESG instead of CSR. However, we adhere to the view that the terms are very closely related (see also Gillan *et al.*, 2021).

As a starting point, we investigate potential motives and driving forces behind ESG strategies and investments, and deduce a potential channel from ESG criteria-fulfilling companies and their stock price performance during crises. We focus in particular on the stakeholder and the shareholder perspectives, and use the standard valuation perspective of stock prices to structure our analysis (see also Gormsen and Koijen, 2020). Stock prices reflect the discounted stream of future dividends earned by shareholders. Hence, any shock may either affect current dividends and their future growth or the expected rate of return (and the associated risk premium) demanded by investors.

Motives and driving forces behind ESG strategies. ESG refers to the incorporation of environmental, social, and governance considerations into corporate management, financial decision-making, and investors' portfolio decisions (Liang and Renneboog, 2021). Bénabou and Tirole (2010) distinguish between three main motives: reputational concerns of corporations (doing well by doing good), delegated philanthropy (the firm as a channel for the expression of shareholders' values) and insider-initiated corporate philanthropy (management uses the corporation to implement their social values). While the first two aspects translate into a long-term orientation for the firm, the latter is closely tied to potential corporate governance problems. With the former two views firms give up short-term profits in exchange for long-term ones or for achieving social goals shared by stakeholders.

Trading off short-term profits with long-term shareholder value is associated with a number of strategies on which many studies have focused on. By developing an industry equilibrium model Albuquerque *et al.* (2019) argue that CSR/ESG is associated with a product

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differentiation strategy which means that firms that undertake such a strategy face less elastic demand and hence are able to increase their long-term profits. In addition, these authors stress that these firms are able to avoid certain risks that makes them more attractive to investors. Furthermore, using standard asset-pricing arguments they show that from the perspective of a risk-averse investor, firms facing a less price elastic demand have lower systematic risk that leads to their higher values. McWilliams and Siegel (2011) combine arguments from the resource-based framework and standard economic models to argue that CSR/ESG can act as the private provision of public goods which in turn can be used strategically by managers to increase firm value. Along a similar vein, Brekke and Nyborg (2008) argue that ESG may act as a screening strategy in the labor market that enables the firm to attract highly motivated and productive employees that thereby increases the long-term value of the firm. Relatedly, in an early contribution Russo and Fouts (1997) consider ESG as a mechanism for developing long-term environmental resources and capabilities. Other aspects of value-enhancing ESG strategies are the improvements in long-range innovative capabilities (see Nidumolu *et al.*, 2009), and political and social costs-savings (see Gamerschlag *et al.*, 2011).

The motives of investors to engage in ESG stocks are closely tied to this discussion in the sense that long-term perspectives and risk-mitigation plays a key role. In a detailed study on the motives of investors for engaging in ESG stocks Riedl and Smeets (2017) show that intrinsic motives a well as social image concerns are key drivers of socially responsible investment (see also Bauer *et al.*, 2021). These motives lead investors to undertake such investments even at the expense of financial performance. In addition, Riedl and Smeets (2017) also show that these investors are significantly more long-term oriented, that is, they undertake their investment with a longer investment horizon that makes them more loyal over time to their equity investments.

Krueger *et al.* (2020) stress the role of the perception of severe climate-related risks as a key aspect for institutional investors who are leaning more towards management of such risks rather than divestment strategies (by selling the respective stocks). Verheyden *et al.* (2016) show that relying on ESG strategies indeed curtail tail-risk that lowers the likelihood of a severely negative daily return.

Taken together this literature underscores the importance of risk consideration when investing in ESG assets as well as the long-term orientation of such investors.

Valuation and ESG stocks. In order to explore the overall effects of the COVID-19

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shock to stock prices, it is useful to consider the main elements and driving forces behind stock valuations based on discounted cash flows or dividends. We explore these two elements separately and in more detail by considering the sharp decline in stock prices in February and March of 2020. Starting in mid-February of 2020 stock prices declined by about a third (taking, e.g., the broad Eurostoxx600 index as a benchmark) reaching its trough on March 19, 2020. Using the stock valuation model, this steep change in market prices could either be due to a sudden and sharp reduction in expected cash flows at a given discount rate, or to an increase in the discount rate (see Cochrane, 2011). In the following we explore why an ESG differential might have existed for either factor.

Cash flow (growth) and stakeholder perspective. The COVID-19 shock had a strong effect on investors' perception about future earnings and their growth. The downward adjustment in the immediate period could be different for firms with high and low ESG scores a number of cash-flow related reasons. First, a key potential driver is the build up of trust between the ESG focused firm and their stakeholders (see, e.g., Lins *et al.*, 2017) making the relationship between them more resilient. Hence, the cash flows of the firm would be expected to be less volatile and more stable vis-a-vis the COVID-19 shock . Second, if ESG strategies are associated with a closer and more long-term relationship between stakeholders and the firm (e.g., via product differentiation, see Albuquerque *et al.*, 2019), this relationship could also translate into less pronounced negative effects of the crisis on cash flows leading to a less negative effect on cash flows and their trajectories. If such a long-term relationship also held for shareholders, they would be less willing to sell their stocks. This unwillingness, too, may lead to less pronounced selling pressures on ESG stocks and, hence, the immediate effect on ESG stocks would be that those stocks would outperform during a very pronounced economic shock such as the COVID-19 crisis.

Required return, ESG and COVID-19 One reason for the expected-return differential between low and highly rated ESG stocks could be a structural difference vis-a-vis systematic risk between the two types of stocks (see Giese *et al.*, 2019). A further channel could stem from time-varying expected returns in the crisis. If investors revise their required expected returns upward more strongly for low ESG rated stocks than for highly ESG rated shares, then this revision would translate into a stronger reduction in the stock price of low as opposed to high ESG stocks. The reasons behind lower expected returns for investors with ESG stocks may lie in their willingness to trade-off their social preferences and financial returns (see Cornell, 2021). The differential effect of the COVID-19 crisis on the required

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expected returns could be associated with the long-term orientation of ESG-investors as discussed above. This association would also be in line with the findings on such differential effects during the financial crisis (see Bouslah *et al.*, 2018) as well as with the insurance-like protection aspect of socially responsible behavior of the firm and their investors (see, e.g., Gardberg and Fombrun, 2006; Godfrey, 2005; Godfrey *et al.*, 2009; Kanamura, 2021).

We summarize our discussion in the following two hypotheses.

Hypothesis 1 Investors of firms which follow ESG strategies closely adjust their expected returns and their cash flows less sharply in times of crisis relative to those firms that do not follow these strategies. Therefore, a less pronounced downward pressure on ESG stocks exists that makes them to perform relatively better in crisis.

and

Hypothesis 2 The resilience of ESG stocks vis-a-vis shocks eventually peters out after the immediate crisis. Therefore, the initial performance advantage is not persistent.

3 Data and Descriptive Statistics

Our sample comprises all publicly listed non-finance firms headquartered in the European Union (compositions as of December 31st, 2020) for which ESG scores for year-end 2019 are available in the Thomson Reuters Refinitiv ESG database and for which we could match financials from Bloomberg. We follow Lins *et al.* (2017) and remove micro-cap stocks, that is firms with a year-end 2019 market capitalization of less than $250m. The concern is that they are more volatile and have limited liquidity. As these effects amplify during a crisis (Lins *et al.*, 2017), we exclude them from our analysis. For a similar reason, we exclude firms with a stock price smaller than one Euro since these stocks tend to behave highly volatile as well. These criteria lead to a sample of 1042 firms.

We use the Refinitiv ESG Score database for the main independent variable in this study, the ESG score per firm and its different components. It is calculated based on three *Environmental*, four *Social* and three *Governance* categories that underlie the ESG rating methodology[3][4]. Furthermore, the ESG scores are relative measures - it is the percentile at which the company is ranked within its industry. Hence, it is relative to the industry peers in the ESG database.

[3]We use 2019 ESG scores to exclude that firms adapted their ES policies to the crisis.
[4]We use the weights from the ESG score to scale each subscore, i.e., E, S, G or ES score.

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We calculate the firms' abnormal returns during the crisis period. Following Albuquerque *et al.* (2019) we define the crisis period in our main analysis as being between February 24, 2020 and March 17, 2020. We use information on daily closing stock prices adjusted for dividends and stock splits. We convert all stock prices into Euro based on their historical exchange rate. We use the European value-weighted market value and risk-free rate from Kenneth French data library.[5] Abnormal returns are calculated as the difference between the raw returns and the expected returns which are based on the market model over the 60 month period that ended in January 2020.[6]

We follow Lins *et al.* (2017) and use firm and stock characteristics as additional control variables. All variables are summarized in Table 1. We also add country and industry fixed effects to our analysis[7]. Furthermore, we add daily Fama-French European factors SMB (Small Minus Big), HML (High Minus Low), and RMRF (European value-weighted market portfolio return minus the one-month rate for U.S. Treasury bills), as well as the momentum factor WML (Winners Minus Losers). We also control for the firms' factor loadings based on the Fama-French three-factor model plus the momentum factor. For this purpose we estimate the factor loadings similar to the firm betas over the 60 months prior to the crisis.

[Insert Table 1 about here]

Table 2 presents the descriptive statistics of the main variables of our analysis. As a consequence of our analysis of a rapid and severe stock market decline, the cumulative raw return (CRR) during the COVID-19 outbreak period from February 24 to March 17, 2020 is on average negative. Our variable of interest, the *ESG Score*, has a mean of 56.018 and a median of 57.681. Hence, the firms in our sample perform on average better in environmental and social activities than their individual industry average. This effect is mainly driven by the social pillar with a mean *S Score* of 61.460. The range of the *ESG Score* is from 1.130 to 97.067.

[Insert Table 2 about here]

[5] `https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html`

[6] We exclude firms with less than 12 months of data.

[7] We rely on the 56 industry groups of the Thomson Reuters Business Classification that are used in the Refinitiv data.

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4 Analysis – Results

4.1 Crisis Resilience

We use an OLS model to regress the cumulative abnormal returns (CARs) - over the crisis-period from February 24, 2020 to March 17, 2020 - on ESG Scores. Thereby, we test Hypothesis 1: did firms with higher ESG scores have more resilient stock prices during the initial COVID-19 shock than firms with lower ESG scores[8].

We add the variables in Table 1 as well as industry and country dummies as control variables. In particular, long-term debt (LTD), short-term debt (STD), cash holdings ($Cash$), and profitability ($Profit$) are important in order to control for a tightening of firms' access to external finance and effects on revenues during the crisis (Ramelli and Wagner, 2020). As capital markets during the crisis-period were hesitant to provide financing, firms with more cash, less debt, and higher profitability had better preconditions to maintain their business operations and to continue their investments in the recovery period (De Vito and Gómez, 2020; Ramelli and Wagner, 2020). Furthermore, we add characteristics to the model that can explain stock returns: the natural logarithm of a firm's market capitalization ($Size$), the Book-to-Market ratio (BtM), a dummy variable for negative Book-to-Market ratios ($Neg.B/M$), returns over the year before the crisis-period ($Moment$), and idiosyncratic stock variance (IR), as well as two factor loadings from the Fama-French three-factor model (SMB, HML), and the momentum factor loading (WML). Industry dummies account for the heterogeneous average ESG scores across industries.

Table 3 summarizes the result. The standard errors are clustered on the industry level.

[Insert Table 3 about here]

Specification 1 shows a positive coefficient for the ESG score. It is statistically significantly different from zero at the 5% level. Taking a more nuanced look in specifications 2-5 of Table 3 shows that this positive effect is driven by the ES factors. While both the *E score* and the *S score* have a statistically significant effect, the *G score* seems to have no effect.

Using only the ES score - as proposed by Albuquerque *et al.* (2020) - we find a positive effect that is different from zero at the 1% evel. A one standard deviation increase in the ES

[8]We follow Lins *et al.* (2017) who find stock price overperformance of higher ES-rated firms during the financial crisis.

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score is associated with a 1.9 percentage points increase in the CAR during the crisis period. The economic size of the effect of the E and S factors is rather similar. A one-standard deviation increase in the *E score* leads to a 1.3 percentage points increase in the CAR. The respective number for the S factor amounts to 1.7 percentage points. The coefficient for the G factor is not statistically significant that indicates that the more traditional mechanisms (governance mechanisms) seem to have played no special role in the COVID-19 related stock market crisis in 2020.

4.2 Persistence

In the next step, we investigate the persistence of the effects summarized in Hypothesis 2. For this, we extend the observation period starting step-wise with the origin of the crisis on February 24. We use our baseline model for the CAR as laid out in Table 3 and estimate the model for different time windows. We start with February 24, 2020 and expand our observation window step-by-step on a daily (trading-day) basis. We move the window forward for a maximum of 60 days. We report the resulting estimates of the respective coefficients and the corresponding confidence intervals for the ES, the E as well as the S score in Figures 1 - 3. The three figures illustrate the time series of the effect. Note that all regressions include the full set of control variables.

Figure 1 shows that firms with a higher ES score started to mildly outperform their counterparts with a lower ES score right from the beginning of the crisis. This effect became more and more pronounced and statistically significant until the trough of the stock prices in the COVID-19 crisis was reached on March 19, or after 17 trading days . Until the beginning of the fifth trading week the effect was positive and statistically significant. Thereafter the effect remained positive but became statistically insignificant. In the seventh week of trading the coefficient for the *ES score* became basically zero, that is, the effect of the *ES score* completely vanished. Afterwards it basically stays at the zero-line. Hence, there is no long-term effect of the *ES score* on the CAR of the firms in our sample.

Similar patterns can be observed in Figures 2 and 3. A close look at these figures shows that the effects are relatively more pronounced in size and statistical significance with the *S score* than the *E score*. The *E score* coefficients are statistically significant for a smaller number of trading days.

[Insert Figures 1 - 3 about here]

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Hence, our analysis provides evidence for Hypothesis 2.

5 Conclusion

The main aim of this paper is to analyze the performance of socially responsible investments during the COVID-19 associated stock market crash. We focus on the European market in which aspects of socially responsible investments have turned out to become particularly important in the public debate but also in the financial service industry (e.g., in asset management). We take an extensive list of further risk factors as well as firm characteristics into account to carve out the effects of higher ESG ratings on stock market performance. We provide some evidence for the insurance effects of socially responsible investment. While our analysis shows a positive statistically significant effect of ESG scores in the downturn of the crisis, the effect is economically rather small in size and fades away completely in the recovery of the market. Our findings are in line with theoretical reasoning and add to a further understanding of socially responsible investment: while they provide a certain degree of insurance there are no persistent effects over a longer period of time.

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Variable	**Definition**
Size	Natural logarithm of a firm's market capitalization
LTD	Long-term debt divided by total assets
STD	Debt in current liabilities divided by total assets
Cash	Cash and marketable securities divided by total assets
Profit	Adjusted operating income divided by total assets
BtM	Book value of equity divided by market capitalization
Neg. B/M	Dummy variable set to one if the Book-to-Market ratio is negative
Moment	Cumulative raw return of each company over the period from February 22nd, 2019 until February 23rd, 2020
IR	Residual variance from the market model estimated over the five-year period from February 2015 until January 2020
Industry	56 industry groups of the Thomson Reuters Business Classification

Table 1: Control variables

	N	mean	sd	min	max
CRR	1022	-0.346	0.152	-0.773	0.283
CAR	1022	-0.217	0.180	-0.739	1.470
$ESG\ score$	1022	56.018	19.556	3.001	94.105
$ES\ score$	1022	57.763	21.991	1.130	97.067
$E\ score$	1022	51.528	26.169	0	98.989
$S\ score$	1022	61.460	21.697	2.040	97.568
$G\ score$	1022	52.035	22.467	1.154	97.917
$Size$	1022	21.821	1.406	19.347	26.384
LTD	1022	0.220	0.154	0	1.019
STD	1022	0.268	0.152	0	1.013
$Cash$	1022	0.122	0.133	0	0.952
$Profit$	1022	0.078	0.112	-0.738	2.103
BTM	1022	0.530	0.559	-1.876	11.915
$neg\ BTM$	1022	0.011	0.103	0	1
$Moment$	1022	0.174	0.318	-0.727	8.319
IR	1022	0.012	0.007	0.002	0.336

Table 2: Descriptive statistics

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	(1) CAR	(2) CAR	(3) CAR	(4) CAR	(5) CAR
ESG score	0.0009**				
	(0.0004)				
ES score		0.0009***			
		(0.0003)			
E score			0.0005**		
			(0.0002)		
S score				0.0008**	
				(0.0003)	
G score					0.0002
					(0.0003)
Size	-0.0023	-0.0028	0.0002	-0.0015	0.0042
	(0.0051)	(0.0049)	(0.0044)	(0.0050)	(0.0043)
LTD	-0.0286	-0.0268	-0.0216	-0.0255	-0.0178
	(0.0618)	(0.0614)	(0.0613)	(0.0616)	(0.0629)
STD	-0.1009*	-0.1020*	-0.0981*	-0.0953*	-0.0855
	(0.0536)	(0.0534)	(0.0534)	(0.0542)	(0.0551)
Cash	0.0403	0.0449	0.0432	0.0419	0.0334
	(0.0585)	(0.0585)	(0.0570)	(0.0592)	(0.0588)
Profit	0.1053	0.1064	0.0995	0.1054	0.0961
	(0.0790)	(0.0766)	(0.0775)	(0.0755)	(0.0759)
BtM	0.0164	0.0158	0.0171	0.0168	0.0196
	(0.0120)	(0.0119)	(0.0122)	(0.0117)	(0.0118)
neg BtM	-0.0306	-0.0321	-0.0295	-0.0334	-0.0282
	(0.0897)	(0.0895)	(0.0895)	(0.0889)	(0.0885)
Moment	0.0021	0.0016	0.0002	0.0017	-0.0002
	(0.0197)	(0.0193)	(0.0194)	(0.0195)	(0.0203)
IR	3.2639***	3.2268***	3.1849***	3.2420***	3.1989***
	(1.1553)	(1.1385)	(1.1535)	(1.1406)	(1.1887)
Constant	-0.2960***	-0.2875***	-0.3235***	-0.3189***	-0.3968***
	(0.1004)	(0.0987)	(0.0921)	(0.1004)	(0.0912)
Industry FE	yes	yes	yes	yes	yes
Country FE	yes	yes	yes	yes	yes
Factor loadings	yes	yes	yes	yes	yes
Observations	1022	1022	1022	1022	1022

Standard errors clustered on the industry level in parentheses.

$^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 3: Crisis resilience

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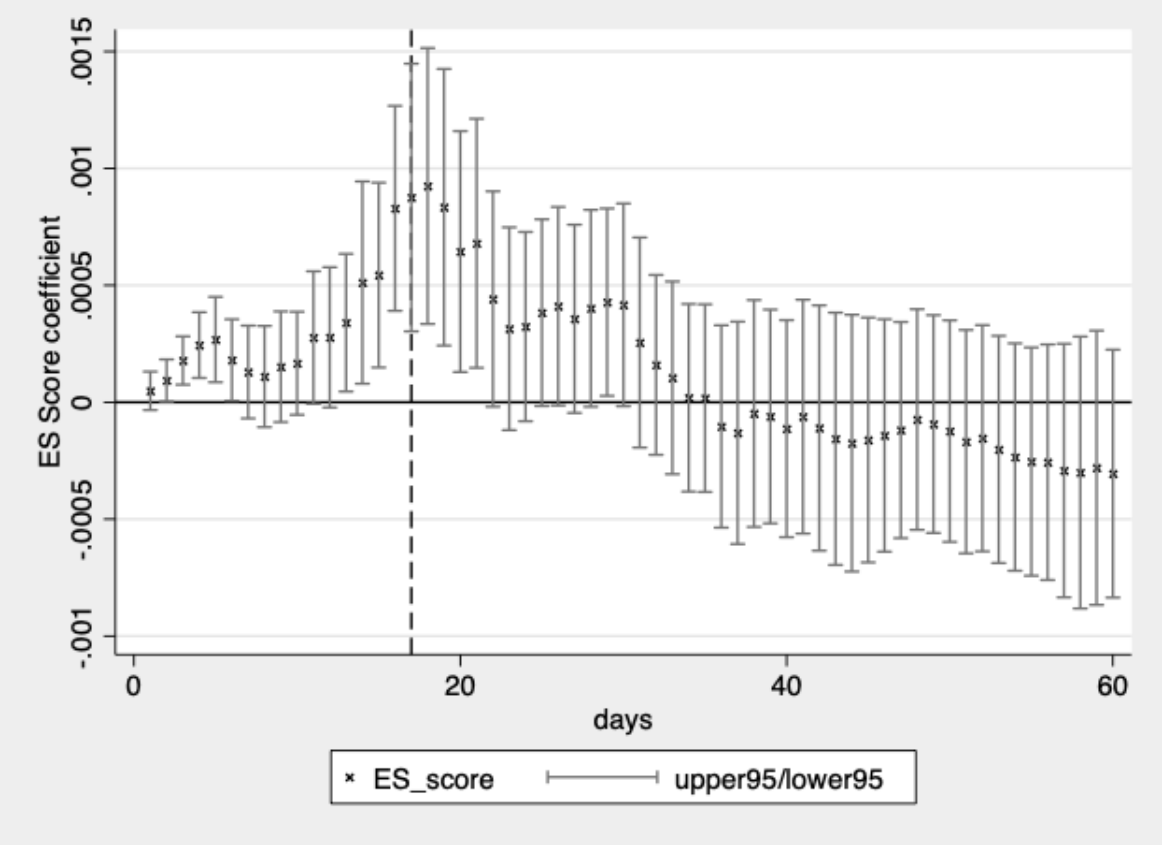

Figure 1: Persistence – ES scores

Notes: The figure shows results from our main regression analysis of the cumulative abnormal return for different time window lengths since the outbreak of the crisis. The coefficient for the *ES score* for each time window length is displayed together with the 95-percent confidence interval, which we calculate using on the industry-level clustered standard errors. The regressions include the full set of control variables. The dashed line indicates the end of the crisis period.

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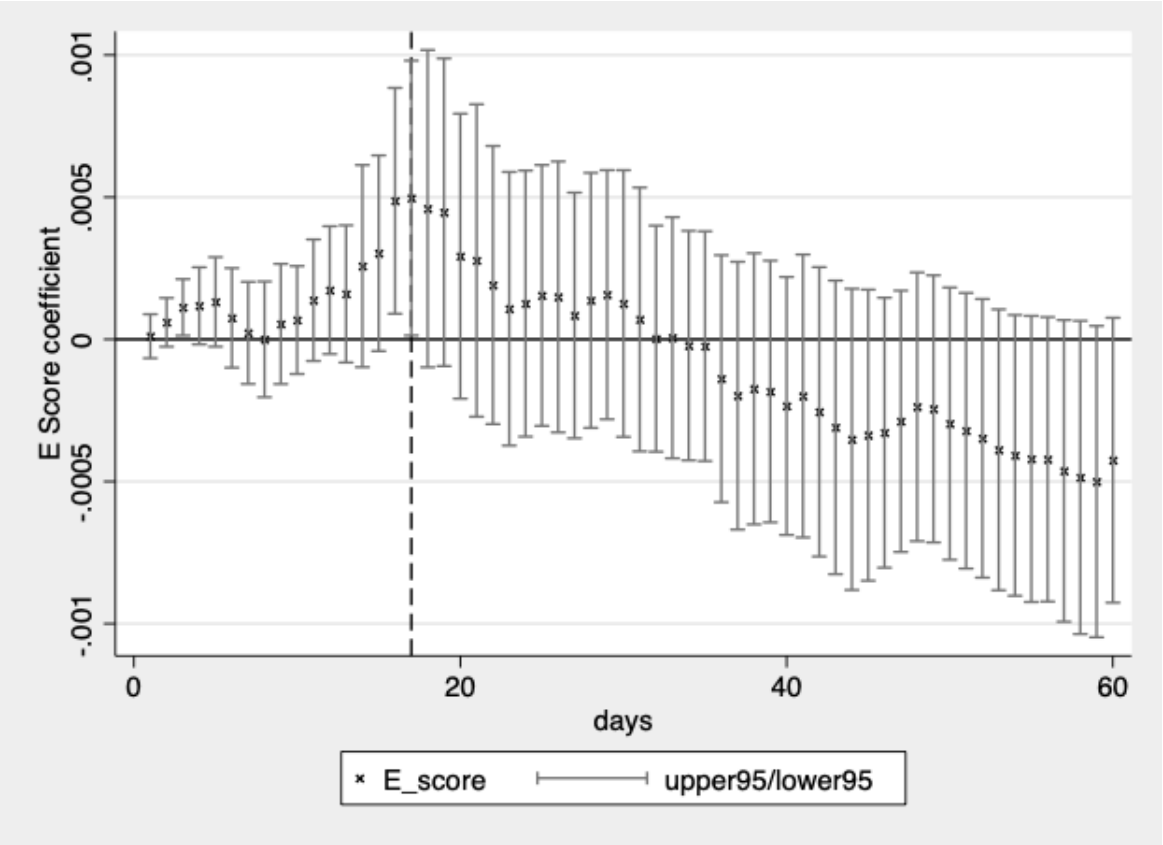

Figure 2: Persistence – E scores

Notes: The figure shows results from our main regression analysis of the cumulative abnormal return for different time window lengths since the outbreak of the crisis. The coefficient for the *E score* for each time window length is displayed together with the 95-percent confidence interval, which we calculate using on the industry-level clustered standard errors. The regressions include the full set of control variables. The dashed line indicates the end of the crisis period.

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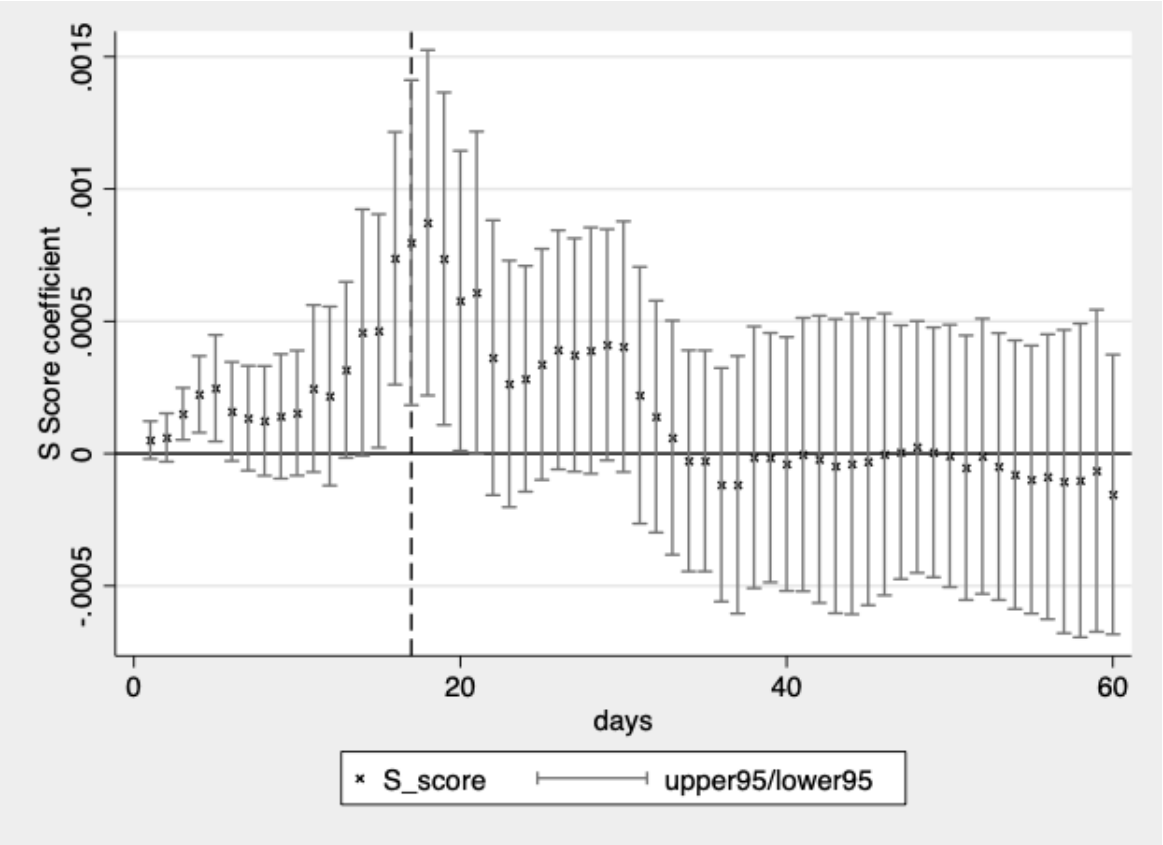

Figure 3: Persistence – S scores

Notes: The figure shows results from our main regression analysis of the cumulative abnormal return for different time window lengths since the outbreak of the crisis. The coefficient for the *S score* for each time window length is displayed together with the 95-percent confidence interval, which we calculate using on the industry-level clustered standard errors. The regressions include the full set of control variables. The dashed line indicates the end of the crisis period.

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