Socially responsible banking: Weathering the Covid-19 storm

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Abstract

This paper investigates the impact of socially responsible banking activities on banks' risk profiles, using data from the period of turmoil caused by the Coronavirus (Covid-19) outbreak in Europe. Our findings show that socially responsible banking activities served as a risk-hedging strategy at the peak of the pandemic. Furthermore, we reveal the role of banks' environmental and social engagement in reducing the exposure to country-level Covid-19 cases and public perception using a Google Trends sentiment analysis. Finally, in explaining the ESG-bank risk relationship, we identify a mediating role of the Covid-19 "panic" as a viable economic channel.

Keywords: Environmental, Social and Governance (ESG); Covid-19; European Banking; Bank Stability; Google Trends.

***JEL* Classification:** G01; G21.

1. Introduction

The disruptive effects of the Covid-19 pandemic in 2020 structurally changed the economic, financial, and social relationships worldwide. No country was prepared: all human activities faced an unprecedented level of uncertainty and volatility, while experiencing an enormous health and death toll. In the same year, global sustainable financial assets grew at their highest level ever (Alliance, 2021), while the debate on their impact on firms' financial performance and risks is still open.

Socially responsible practices are defined as policies aimed at protecting the environmentand social equality by adopting stakeholder-oriented corporate governance models. According to theliterature, they allow companies to increase shareholder and stakeholder welfare through signaling firms' involvement in environmental, social, and governance (ESG) actions (e.g., McWilliams and Siegel, 2001; Ferrell et al., 2016). The mechanism is summarized by the "doing well by doing good" concept: from a risk management perspective, the "risk mitigation view" links firms' sustainability to its hedging properties during periods of financial turmoil (Bouslah et al., 2018). In contrast, ESG issues may also signal potential agency problems (Friedman, 1970): the "overinvestment view" suggests that managers engaging in ESG activities may generate personal benefits at the expense of shareholders. However, recent evidence finds that socially responsible practices increase firms' reputation (Bouslah et al., 2018; Albuquerque et al., 2020) and financial stability (Lins et al., 2017; Lu and Wang, 2021; Chiaramonte et al., 2022; Trinh et al., 2023), especially during periods of financial distress.

In this paper, we investigate if banks that engage more in socially responsible activities were more stable during the Covid-19 pandemic. Several papers address the nexus between financial and non-financial performance during the pandemic (e.g., on the resilience of sustainable stocks in Cardillo et al., 2022; or the safe-haven properties of ESG indexes in Piserà and Chiappini, 2022). However, few contributions consider banks' non-financial performance and stability during this grim period.

We focus on Europe for two reasons. On one hand, many European countries experienced a dramatic increase in contagion at the initial stages of the pandemic: the World Health Organization

(WHO) declared Europe the "epicenter" on the 13th of March. In addition, European institutions took strong actions on sustainability over recent years. For example, in 2014 the European Union (EU) amended the Non-Financial Reporting Directive (Directive 2014/95, or NFRD), requiring numerous firms operating in the EU to disclose their environmental and social engagement. Similarly, in 2020 the European Banking Authority (EBA) discussed the relevance of managing ESG risks in credit institutions and within the securities industry; shortly after, the European Central Bank (ECB) announced the inclusion of climate-related risks in 2022 banking stress tests, supporting the growth of ESG engagement in banks (EBA, 2020; ECB, 2020).

The first contribution of this paper relates to the impact of ESG strategies on banks' stability during the pandemic shock in a region (Europe) characterized by a regulatory environment strongly committed to sustainability. Earlier studies emphasize how pandemic risks affect the financial stability of firms, as well as how formal and informal safety nets exist (Ho et al., 2023). We follow this literature and explore how banks' engagement affected Credit Default Swaps (CDS) spreads when the impact of Covid-19 cases increased, and panic began to rise among people. Secondly, we consider the pandemic in a quasi-natural experimental setting, showing how banks that are more engaged in ESG practices were affected differently by the outbreak at its peak (Albuqerque et al., 2020). Finally, we are the first to exploit a 'big data' approach to run a sentiment analysis aimed at disentangling the economic mechanism behind the ESG-risk nexus. We demonstrate how panic, proxied by Google searches of the word "Covid-19", acts as an economic channel explaining the ESG-Covid-19 cases and the CDS spread relationships, in a triple interaction econometric setting. The use of this innovative approach allows us to capture investors' sentiment, thus empirically identifying a channel for the moral capital within the stakeholders' theory literature.

Our evidence confirms the prevalent view of the ESG-risk nexus, applied to the pandemic shock. We find that banks with higher ESG ratings perform better in terms of risk (proxied by CDS spreads) when Covid-19 cases increase. Moreover, we find that the relationship is driven by the environmental (ENV) and social (SOC) components of ESG scores. Importantly, our quasi-natural experimental setting provides the same outcome: the greater the banks' ESG engagement in 2019, the lower the short-term impact of the pandemic. In this framework, we find that the SOC pillar is more causally related to CDS spreads in terms of economic magnitude. In addition, in line with our expectations, our evidence shows that the ESG-Covid-19 cases and CDS spreads relationships are explained by the pandemic-induced panic, measured through the sentiment analysis captured by Google Trends.

In terms of policy implications, our results offer support to the current European regulatory commitment in enhancing the adoption of sustainability practices in banks. They also reveal the importance for banks' management of focusing not only on environmental and climate changes issues, but also on the social dimension, as set out in the recent EU regulation (852/2020) on the establishment of a framework to facilitate sustainable investments. Our main contribution revolves around the enhanced financial stability of banks resulting from ESG engagement, whether this is regulatory driven or voluntarily pursued by credit institutions.

The remainder of the paper is organized as follows. In Section 2 we review the literature and formulate our hypotheses. In Section 3 we describe the empirical strategy and the data sample used. In Section 4 we discuss the main findings, and we test their robustness in Section 5. Finally, in Section 6 we conclude and provide the policy implications of our study.

2. Selected literature and research hypotheses

The relevant theoretical literature shows that the link between sustainable and responsible activities of firms and their risk-propensity is explained by two opposite views (Bouslah et al., 2018): the "risk mitigation view" and the "overinvestment view". The former originates from the stakeholder theory and argues that social capital derived from firms' investments in environmental and social activities acts as an "insurance-like" mechanism that generates moral capital or goodwill among stakeholders (Godfrey et al. 2009; El Ghoul et al., 2017). The latter derives from the agency theory and considers investments in social capital as a waste of resources, hence implying a positive association with firm risk derived from "managerial entrenchment". According to this view, managers may seek to overinvest in social activities for their private benefit through the construction of a reputation of "good global citizens" (Barnea and Rubin, 2010), or to gain support from environmental and social activists (Cespa and Cestone, 2007). The two views predict two opposite outcomes for the relationship between ESG and firm risk: negative for the risk mitigation approach (greater resilience), and positive for the overinvestment hypothesis (managerial entrenchment).

The empirical literature is scarce and focuses mainly on non-financial firms, and on the relationship between ESG scores and financial performance (Margolis and Walsh, 2003; Barnett and Salomon, 2012; Santis et al., 2016). CDS spreads are widely used in the literature to capture the relationship between ESG engagement and credit risk in non-financial firms. The typical finding is a negative association between them across different samples (Abdul Razak et al., 2023 at the global level; Barth et al., 2022 for the US and the EU; Caiazza et al., 2023 for the US). Other recent studies extend to innovative methodologies in analyzing sustainability issues (Kiesel and Lucke, 2019, examine the contents and language of credit rating reports to identify ESG-related commentaries in the US and EU; Naumer and Yurtoglu, 2022, examine positive/negative corporate ESG news effects on spreads).

The few studies on banks investigate specific portions within the ESG framework. Anginer et al. (2018) find that a subset of corporate governance ("shareholder friendliness") leads to higher stand-alone and systemic risks, especially for larger banks or with stronger safety nets. Gangi et al. (2019) argue that more environmentally engaged banks exhibit less risk. Lins et al. (2017), focusing on the Global Financial Crisis, conclude that ESG practices allows to restore stakeholders' trust on capital markets and institutions when an exogenous event leads to an unexpected decline. To the best of our knowledge, only Chiaramonte et al. (2021) investigate the link between bank stability and all ESG dimensions, also searching for robust evidence of a risk reduction channel in the specific context of financial crises. Their findings confirm that besides benefits for the environment and the society, ESG engagement in banking strengthens its resilience to financial shocks, namely, the global sub-prime and the European sovereign debt crises. Other studies on banks during financial crises underlined how distinct governance features of banks lead to different terms in funding firms depending on the role of banks as both shareholders and lenders (Álvarez-Botas et al., 2022) or distinct levels of risk propensity in banks being privately owned or publicly traded (Samet et al., 2018). Unlike this literature, our focus is the non-financial pandemic shock.

The pandemic shock sees a recent growth in the related literature (see Savio et al, 2023, for a systematic literature review, and the limited presence of bank studies). Our main research question is to study the resilience of European banks that are more engaged in terms of ESG in this unique setting. Although the Covid-19 shock originated outside the banking sector, consequences in the financial sector have been significant, with expectations of significant long-lasting effects for several years ahead. For example, Duan et al. (2021), by using the Covid-19 cases as a measure of financial distress induced by the pandemic, find that it leads to a general increase in banks' systemic risk. Using panel regression models and a sample of 64 countries worldwide, they conclude that the negative impact of Covid-19 cases on banks' risk may derive from two economic channels: the level of government stringency and contagion caused by bank level default risk. Additionally, impacts of the pandemic on the efficiency of Islamic banks, and novel methodological approaches are proposed in Boubaker et al. (2023): our aim differs by focusing on the relationship between financial stability of banks and their non-financial performance.

Other papers examine the impact of ESG scores during the pandemic, with a focus on non-financial firms and their overall performance. Bae et al. (2021) and Demers et al. (2020) find that a firm's Corporate Social Responsibility (CSR) performance is unrelated to its financial riskiness and performance after the Covid-19 crisis hit financial markets: firms that are socially responsible were not more resilient. More precisely, Bae et al. (2021) employ a panel regression model on a sample of 1,750 US firms and find a weak relationship between CSR and financial returns, especially when firms' CSR policies are supported by the institutional environment. Similarly, Demers et al. (2020) explore US firms' engagement on CSR activities during the Covid-19 period and using an OLS regression, conclude that responsible firms underperformed both during the first Covid-19 wave (from January to March 2020) and during the postrecovery period (after March 2020). However, the authors acknowledge that results on CSR in US countries may be not generalizable due to the widely recognized lower public attention on sustainability in the US, if compared to Europe and other countries. In contrast, Albuquerque et al. (2020) shows that high CSR-rated firms exhibit better financial performance in terms of higher stock returns and lower stock volatility during the pandemic. By using both a multivariate and quasi-natural experimental models on a sample of 2,171 daily observation on non-financial entities in the US, they conclude that firms that are more engaged in environmental and social activities exhibit positive abnormal returns, and lower idiosyncratic risks if compared to laggards. Additionally, they find that the positive relationship between CSR and performance is mediated by customer loyalty and investor segmentation.

Nevertheless, the pandemic impact on infrastructures, supply chains and health systems is unprecedented, promoting stakeholders' panic, negative sentiment and reactions affecting financial markets volatility as the number of cases increased (Baig et al. 2021). However, measuring stakeholders' panic is not a trivial task. According to Simionescu and Raisiene (2021), Covid-19 searches on Google Trends is a useful sentiment indicator of stakeholders and shareholders' fear and uncertainty. Similarly, other studies (see e.g., Caperna et al., 2020) show the effectiveness of Google searches in proxying the Covid-19 perception and its impact on social changes (e.g., unemployment). Another advantage of this approach is to increase the prediction power of regression models especially for the pandemic shock rather than the Global Financial Crisis of 2008-2009 (Yi et al. 2021). From a more bank-specific perspective, Google Trends is used as a proxy for depositors' fear, that can ultimately affect banks' insolvency (Anastasiou and Drakos, 2021): in a panel vector autoregressive (VAR) model, authors document that European Union countries with the highest volumes of crisis-related words searches are those with the highest probability of banks' insolvency. However, whether and how the ESG dimension enters this relationship remains a fundamental and open research question.

Given these reasons, we formulate our first research hypothesis as follows:

H1. Higher ESG scores (total or disaggregated) of a bank are associated with a lower market perception of its default risk, with a stronger effect when country-level Covid-19 cases increase.

The pandemic was a non-financial and global "black swan" event that triggered a deep economic and financial crisis. As discussed above, it represents an ideal setting to evaluate the ESG-risk relationship exploiting the exogenous nature of this shock. Albuquerque et al. (2020) identify two reasons that may explain market reactions to the pandemic. The first one is that ESG policies may represent an alternative to product differentiation, leading to lower price elasticity of demand and a greater customers' loyalty (see also Albuquerque et al., 2019). The second one relies on the assumption that ESG-focused investors could be less sensitive to external shocks or to differences in short-term performance (Bollen, 2007; Renneboog et al., 2011), and therefore less likely to sell sustainable investments. This hypothesis explains why market performance and perception of credit risks may differ for these assets.

Despite the former argument on the demand side seems relevant for the whole market, the short-term impact of the pandemic did not affect the 'consumption' of bank-related products and services as much as other sectors, more exposed to the disruption of global supply chains or measures such as lockdowns or travel bans. Therefore, since we focus on the banking industry, we postulate our second research hypothesis as the expected market reaction to the pandemic of ESG-focused stakeholders, within an event study framework able to capture the pre- and post-shock reactions of banks at varying degrees of ESG engagement:

H2. Banks with higher ESG scores (total or disaggregated) benefit from a lower market perception of its default risk after the exogenous pandemic shock erupts.

The two hypotheses are distinct for theoretical reasons, leading to a different empirical approach. In the first case, we aim at disentangling the response of banks' stability to the pandemic pressure exerted to the entire economic system and measured in terms of "panic" mounting around infection cases. The second hypothesis, instead, aims at seeking the potentially alternative response at different levels of ESG engagement of banks in the aftermath of the shock, in an event-study framework, and tries to overcome the limitation findings being limited to simple correlations by seeking evidence of a causal relationship.

3. Methodology and data

3.1 Empirical strategy

Our empirical methodology is based on two sets of analyses. We start by investigating if socially responsible banks operating in European countries have lower CDS spreads when stakeholders' panic increases, proxied as the number of country-level Covid-19 daily cases. We run a panel fixed effects regression model with daily banks' CDS spreads, Covid-19 cases, and banks' ESG scores. The main beneficial outcome of this cross-country setting consists of a robust average association between banks' ESG scores and daily CDS spreads, where there is no tie with a specific shock date (Albuquerque et al. 2020). We are therefore able to consider country-specific waves of the pandemic, preserving cross-countries differences. Moreover, having yearly ESG scores and daily CDS data, we are confident that reverse causality issues between our target variable (ESG) and our dependent variable (CDS spreads) are minimized.

Thus, we use the following equation for the model aiming at testing our first hypothesis (H1):

$$CDS_{it} = c + \beta_1 ESG_{i,t-1} + \beta_2 Covid\text{-}19\ Cases_{i,t-1} + \beta_3 (ESG*Covid\text{-}19\ Cases)_{i,t-1} + +\beta_4 X_{i,t-1} + \upsilon_i + \gamma_i + \varepsilon_{i,t} \quad [1]$$

where the daily 5-year CDS spreads is the market-based risk measure for each bank i at day t (Gao et al., 2021). This data originates from Bloomberg and covers the two-years period from January 2019 to

December 2020.

In line with previous research (Albuquerque et al., 2020; Chiaramonte et al., 2021), we proxy the CSR engagement (target variable) through ESG, Environmental (ENV), Social (SOC) and Governance (GOV) scores. Then, we interact each target variable with the number of daily Covid-19 confirmed cases (Covid-19 Cases), provided by the European Centre for Disease Prevention and Control (ECDPC)[1]. Consistently with recent studies examining the relationship between CSR and bank risk (e.g., Gao et al., 2021), we include a vector of control variables (X) that are expected to be associated with CDS spreads, namely bank size, capitalization, credit risk, efficiency, profitability, liquidity, income diversification, ECB's liquidity injection proxied by the Pandemic Emergency Purchase Programme (PEPP) (D_PEPP in the tables) and the Covid-19 induced oil shock (D_Oil_shock in the tables). Lins et al. (2017) observe that the inclusion of these control variables, in addition to bank, and time fixed effects[2], reduces the concern of omitted variable issues, capturing the effectiveness of ESG engagement in enhancing banks' stability. Finally, c is a constant term, while υ_i and γ_i are the unobserved bank- and time-specific fixed effect, respectively, and μ_{it} is the idiosyncratic error.

Table 1 defines our variables and data sources. All variables in the model are winsorized at the 1% of each tail to mitigate the effects of outliers. Standard errors are clustered at the bank-level.

[Insert Table 1 about here]

Secondly, we are interested in exploring the financial and economic shock caused by the Covid-19 pandemic, in a Difference-in-Difference (DID) regression setting, with and without propensity score matching (PSM).

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[1] COVID-19 daily cases data are publicly available at the following link: https://www.ecdc.europa.eu/en

[2] Results are quietly similar replacing bank and time fixed effects with country and time fixed effects as well as country×time fixed effects.

We follow the literature (Albuquerque et al., 2020; Ramelli and Wagner, 2020) to identify the starting date for the pandemic period and choose the 24th of February. The date corresponds to the first trading day after the announcement of lockdowns in Europe (specifically, in Northern Italy). Therefore, we employ the following quasi-natural experiment setting to investigate our second hypothesis (H2), over a period of three months before and after this date[3]:

$$CDSit = c + \beta_1 D\_Covid\text{-}19 + \beta_2 Treated + \beta_3 Treated{*}D\_Covid\text{-}19 + \beta_4 X_{i,t-1} + \upsilon_i + \gamma_i + \varepsilon_{i,t} \quad [2]$$

where D_*Covid-19* represents a dummy variable that takes the value 1 for the period of three months after the 24th February, and 0 before; the dummy *Treated* takes the value of 1 for banks above the top quartile values of ESG, ENV, SOC and GOV scores in 2019, and 0 otherwise; and Treated*D_Covid-19 represents their interaction. These represent our main target variables. We also include a set of bank controls (X) explaining different aspects of banks performance, including profitability (Return on Assets, Roa), liquidity (cash to total assets ratio, Cash_ta), asset quality (loan loss reserves to gross loans ratio, Llr_gl), capitalization (equity to total asset, Eq_ta), and income diversification (measured as non-interest income to net operating revenue, Div), as well for time and bank effects as in Equation (1).

Consistently with Albuquerque et al. (2020), causality links in terms of stability due to the socially responsible engagement of European banks can be inferred in this setting. This is because yearly ESG scores are lagged with reference to the pandemic, while we investigate a short time window and adopt daily CDSs spreads as the dependent variable. Finally, to address the potential bias arising from treated and control groups heterogeneity, in the robustness test section we also run a PSM procedure (Rosenbaum and Rubin, 1983) with Caliper radius 10% score, strengthening the validity of our results.

[3] Results obtained by extending or reducing the length of the period under investigation are qualitatively similar and are available upon request.

3.2 Sample and Descriptive Statistics

Our analysis focuses on European banks, with data available from S&P ESG scores (our main variable of interest) and Bloomberg ESG transparency scores (as an alternative measure), both at composite and disaggregated levels, during the period 2019-2020. These scores are designed to provide multiple layers of ESG engagement with three underlying Environmental, Social, and Governance & Economic Dimension Scores, with an average of 23 criteria informed by 61 industry-specific approaches, scrutinized annually. Since S&P Global does not specify the reason for missing values on ESG scores, it would be biased to compare banks that do not disclose this information with those that do (one bank might be highly or lowly engaged, regardless of receiving or not an explicit score), thus we consider only banks without missing values.

The adoption of ESG scores to proxy for banks' social responsibility is consistent with the literature (Liang and Renneboog, 2017; Chiaramonte et al., 2022), and in line with the approach adopted by consulting firms, financial advisors, and asset managers in this field. The final sample consists of 85 listed banks headquartered in 22 European countries. Table A.2 in the Appendix provides a further breakdown of our sample and observations by country.

Since ESG issues are particularly relevant in Europe[4] (Chiaramonte et al., 2022, Cuomo et al. 2022), also at a regulatory level (the Non-Financial Disclosure Directive 2014/95/EU, the 2020 EU Taxonomy due to the Regulation 852/2020, the 2021 EBA climate stress tests), the focus on this area allow us to corroborate the ESG role in enhancing financial stability during the pandemic shock. Secondly, Europe was epicenter of the Covid-19 outbreak for "Western" countries. Figure 1 shows the average daily Covid-19 cases for 2020, relative to the population at the end of 2019, by country. Despite the pandemic being a worldwide shock, the heterogeneity across countries is quite evident, spanning from 0.001% to over

[4] Results hold also by excluding Italian, Polish and UK banks from the sample.

0.015% of relative daily cases.

[Insert Figure 1 about here]

Instead, Figure 2 plots the average daily Covid-19 cases relative to the European population across time, confirming the strength of the “second wave” occurring in October 2020. More precisely, the trend confirms the importance of considering the Covid-19 not only as a single event, but rather as a time-varying plague that may be captured by the specific number of Covid-19 cases.

[Insert Figure 2 about here]

Table 2 summarizes the descriptive statistics of our main variables and controls.

Focusing on our target variables, CDS spreads (CDS) take an average value of 153 basis points, ranging from 52 (25th percentile) to 194 (75th percentile). The ESG score (ESG), as well as each of its pillars (ENV, SOC, GOV), assume an average value of 55, 57, 54 and 55 percentage points respectively, with the ENV dimension being the highest, while GOV presents the highest standard deviation. Table A.1 in the Appendix shows that although most pairwise correlation coefficients are statistically significant, the magnitudes are low. Moreover, the VIF value is below 2, confirming the lack of multicollinearity issues.

[Insert Table 2 about here]

4. Main Results

4.1 Baseline Analysis

Table 3 reports the results of the baseline model described in Equation (1). In particular, we interact each variable of interest (ESG, ENV, SOC, and GOV) with daily Covid cases (Covid-19 Cases) to assess whether being socially responsible reduces banks' exposure to country-level reactions to the pandemic.

[Insert Table 3 about here]

Table 3 shows that total ESG scores (column I) display a negative and statistically significant relationship with our dependent variable (CDS) only when interacted with the number of daily cases. Economically, an increase of one standard deviation of ESG, ENV, SOC and GOV scores is negatively associated to a decrease of 1%, 1.2%, 1.3% and 0.9% (respectively) in banks' CDS when Covid-19 cases increase. This result is in line with previous research stressing that engaging in socially responsible activities has explanatory power for risk management purposes during periods of financial distress (Albuquerque et al., 2020; Chiaramonte et al., 2021), as conjectured in our first hypothesis (H1) and consistently with Godfrey's (2005) moral capital theory.

This suggests that banks with higher ESG scores are perceived as less exposed to this shock by investors, or as being more resilient to the pandemic-induced increase in panic. Therefore, highly socially engaged banks are less risky also during the exogenous pandemic event and the pressure it exerted on markets, economic and social activities, thereby confirming the validity of the "risk mitigation view", and the role played by trust of stakeholders on market risks. Specifically, if firms' ESG engagement helps strengthening stakeholders' trust (Lins et al., 2017), then it is also expected to pay off when exogenous events reduce trust in financial markets as a whole, and it becomes a more valuable intangible asset. In a comparable manner, Guiso et al. (2008) state that both shareholders and stakeholders are more likely to reward trusted firms, especially when the overall level of financial market trust is low. Therefore, firms perceived as more trusted, receive higher financial valuation from investors and stakeholders during periods of financial uncertainty.

Results also hold looking at the individual pillars of ESG scores (columns II, III, and IV of Table 3), with the ENV–CDS nexus leading the magnitude of this relationship. According to Feldman et al. (1997), environmentalism (for financial firms this may include green loans, environmental assets under management or green project financing), is a key factor in explaining a reduction of perceived riskiness from investors, while Cheng et al. (2014) argue that this may derive from the achievement of stakeholders' expectations due to their sensitivity to the environmental dimension.

The SOC component appears negatively correlated to CDS, suggesting that safe workplaces and employees' wellbeing may lead to more prudent monitoring of lending and investment activities, reducing banks' risk. Moreover, banks' social commitment can also help in building trust among stakeholders, and thus may explain the strong correlation with CDS spreads.

Table 3 also shows a significant and negative relationship with the GOV score as the number of cases increases, corroborating the literature finding a strong correlation between stakeholder-oriented governance and bank stability (Gaganis et al., 2020).

Results for our control variables indicate that income diversification (DIV), the ECB's PEPP announcement (D_PEPP) and the oil shock (D_Oil_shock) are statistically and significantly correlated with CDS spreads. The negative signs suggest that both the higher diversification and the ECB announcement of the extraordinary injection of liquidity, favored the reduction of banks' risk perception.

Finally, as expected, we find a highly significant and positive sign for the daily number of Covid-19 cases. The estimated coefficient suggests that the increase in confirmed cases affected CDS spreads as "panic" circulated among stakeholders. However, the interaction with ESG scores inverts this trend by decreasing CDS spreads: we interpret this result (and further test it later) in the light of a moral capital channel for more socially responsible banks.

4.2 *DID regression results*

In this section, we examine the impact of the Covid-19 outbreak for banks with higher or lower ESG scores, using a DID regression model (see Equation 2). Since our sample is constituted by banks headquartered in Europe, we split it based on the ESG, ENV, SOC and GOV scores at the end of 2019 (see also Albuquerque et al., 2020). We also create a subsample of banks in the top quartile of ESG, ENV, SOC and GOV scores (Treated), and a control group composed by the remaining banks. The quasi-natural experimental approach and the daily frequency of our dependent variable (CDS) allow us to make a strong casual inference to assess the effect of being highly ESG engaged during the pandemic.

We estimate a DID regression of bank-level daily CDS using the 24th of February as the pandemic event date (first trading day after the first lockdown was announced in Northern Italy), corresponding to the day when stock markets experienced an accelerated decline. We repeat this exercise by setting alternative days, confirming the validity of our approach (results are available upon request). Finally, in the robustness section, we also re-run the DID model by applying a Propensity-Score Matching (PSM) approach to further control for bank-specific heterogeneity within our sample.

Table 4 shows the result of the DID regression and confirms that the stabilizing effect of ESG, ENV, SOC and GOV scores arises from banks with higher levels of engagement, hence confirming our expectations as set out in the second hypothesis (H2). These results support the recent efforts exerted by European authorities towards enhanced engagement in responsible business practices.

[Insert Table 4 about here]

Looking at the magnitude of each ESG component, we find that SOC has the strongest impact on CDS spreads. The difference for treated banks is economically significant: CDS spreads are 17% lower for banks with higher ESG score (Treated*Covid-19 coefficient), 30% for banks with higher ENV score (Treated_ENV*Covid-19 coefficient), 35% for banks with higher SOC score (Treated_SOC*Covid-19 coefficient) and 24% for banks with higher GOV score (Treated_GOV*Covid-19 coefficient), if compared to the control group after the outbreak. This is obtained dividing the coefficient for the interaction variable (Treated * Covid-19) and the mean value of CDS of the treated sample after the outbreak (0.93, 0.70, 0.76

and 0.90, respectively, for the ESG, ENV, SOC and GOV scores).

The SOC score relates to the rights, and well-being of people and communities in which firms operate. Therefore, higher levels of social sustainability allow firms to manage social issues by signaling a stronger connection to the well-being of local communities and increasing their approval and trust. Consistently, it is reasonable to argue that banks that are strongly community-oriented are perceived as less risky by investors and better off in weathering the Covid-19 shock. Looking at other pillars, both ENV and GOV remain strongly associated with lower CDS spreads, again corroborating the importance of all three dimensions of sustainability.

This is particularly relevant for two reasons. On one side, the current debate is skewed towards environmental and climate change aspects, and Europe is no exception to this. For example, within the European Union, the recent Regulation 852/2020 (also known as the "EU Taxonomy") clarifies the structure and contents of ESG for reporting purposes, with a growing focus on environmental aspects for 2021 and 2022 but including the social dimension in future years. Additionally, unlike several previous studies finding a limited role played by the governance dimension in financial intermediaries (Chiaramonte et al., 2022), this specific shock underlines its importance, as well as it is supported by the specific approach to its calculation adopted by S&P Global, that includes the "economic dimension" in this pillar (more on this issue in the robustness section below).

Figure 3 clearly illustrates that the trend for the risk measure (CDS) is similar for both the treatment and the control groups, until the outbreak shock, when the slope of CDS spreads remains lower for the treated sample. Hence, the parallel trends showed in the figure support the assumptions of the DID framework.

[Insert Figure 3 about here]

5. Additional analyses and robustness checks

To strengthen the validity of our findings, we run a set of further analyses and robustness checks. Firstly, we are interested in exploring the mechanism behind the ESG-cases and CDS spreads nexus by assessing the "moral capital" channel, exploiting the informative power of big data as provided by Google Trends.

As robustness tests, we re-run our baseline model (Equation 1): i) by using an alternative measure of ESG engagement provided by Bloomberg; ii) by replacing our dependent variable with the 4-months Probability of Default and the daily 1-year Probability of Default; iii) by testing alternative time frequencies for CDS spreads (weekly, monthly and quarterly); iv) by performing a PSM weighted DID regression; and, finally, v) by running a 'placebo test' on the chosen Covid-19 outbreak day.

3.1 Economic channel analysis

Our empirical analysis so far exhibits a strong and negative correlation between banks' ESG engagement and risk, both in a cross sectional as well as in a quasi-natural experimental setting. Although our results are supported by the recent literature (Lins et al., 2017; Albuquerque et al., 2020) little is known about the implicit economic mechanism behind the ESG-risk relationship after exogenous shocks occur. On one hand, the stakeholder theory argues that an "insurance mechanism" (Bouslah et al., 2018) arises from "moral capital" and trust from stakeholders, rewarding more ESG-engaged firms when market conditions worsen. Thus, it is possible to proxy stakeholders' lack of trust and panic by scaling the use of big data analysis provided by Google Trend and testing if it appears to be a valid economic mechanism mediating the nexus between banks' ESG-cases and CDS spreads. To the best of our knowledge, this economic channel has never been empirically evaluated in the literature to date.

If the increase in cases across countries triggered a "panic" reaction by stakeholders, firms with a higher level of ESG engagement may have accumulated a higher moral capital that could have mitigated their perceived risk in the market. We collect data from Google Trends, a publicly available database introduced in 2008 to provide statistics for relative internet search volumes of queries identified by specific keywords, with the opportunity of breaking down results by geographical area.

One of the advantages of Internet searches is the access to "real time" data (weekly frequency), particularly able to capture sentiment indicators (Simionescu and Zimmermann, 2017). Google Trends data are provided as a time series index measuring the volume of queries for a certain keyword in a selected region, country, or city. The index is normalized, reporting 100 for the top query and 0 for the minimum share in the selected period (Choi and Varian, 2012).

We select the highest frequency (weekly) of Google Trends Index (GTI) as a proxy of sentiment on the pandemic among stakeholders. We select the keyword "Covid-19" (as in Simionescu and Raisiene, 2021) at the country level, and then we interact it with banks' ESG, ENV, SCO and GOV scores. Figure 4 shows the average trend in these searches in Europe: compared to cases, the trend is similar but with a different skewness.

[Insert Figure 4 about here]

Next, we test Equation 1 by replacing the number of cases with this new measure (Covid- 19Search), and then we employ a triple interaction to test if the impact of ESG, ENV, SOC and GOV scores on CDS spread is mediated by this measure of "panic" (ESG*Covid-19 Cases*Covid- 19Search). Results are presented in Tables 5 and 6, respectively.

Table 5 shows that the ESG score and its individual components are strongly negatively and statistically significantly correlated with CDS spreads, hence corroborating the "trust signal" provided to stakeholders during the Covid-19 panic.

[Insert Table 5 about here]

To test if stakeholders' sentiment may be considered a valuable economic channel in explaining the

ESG-cases - CDS relationship, we run a triple interaction panel fixed effect regression, where our coefficient of interest is ESG*Covid-19 Cases*Covid-19 Search, capturing the effect of ESG scores on CDS in combination with changes in Covid-19 cases and searches. Table 6 supports the validity of the moral capital assumption: the correlation between ESG, ENV, SOC, GOV, the number of Covid-19 cases and CDS spreads appears to be statistically significant when the stakeholder panic increases. At the same time, the number of Covid-19 cases is positively and statistically significantly correlated to this panic metric, confirming the channel mechanism.

[Insert Table 6 about here]

3.2 Robustness tests

Since our main analysis relies on a specific market-based risk indicator, it could be biased by being only a partial view on our target relationship. Therefore, we run our baseline estimation using, as dependent variables, two alternative measures of banks' risk: the 4 months probability of default (4 months PD) and the 1 year probability of default (1 year PD). The rationale of the measure is unchanged: higher PDs are associated with a higher likelihood of insolvency and, therefore, to a higher bank risk.

Data for both variables are collected from Bloomberg. Since PD measures are highly skewed, we use their natural logarithm. Table 7 shows how results are consistent with our main findings.

[Insert Table 7 about here]

Similar concerns may surround the use of one specific measure for ESG scores, hence being affected by choices made by their provider. For this reason, we stress the robustness of our results by using an alternative ESG score, provided by Bloomberg. Bloomberg ESG scores (BESG, BENV, BSOC and

BGOV) are built with a different methodology and focus on the level of transparency of disclosures on sustainability, rather than on the level of engagement. As shown in Table 8, we find again support for our baseline results.

[Insert Table 8 about here]

Two additional issues may arise from the heterogeneity across banks in our sample or from how we designed the identification of the pandemic shock. Therefore, we re-estimate our DID regression using the following two alternative settings: 1) after running a Propensity Score Matching (PSM) procedure with Caliper 10%; 2) by running a placebo test, considering the Covid-19 shock as group of different structural events, rather than an individual episode.

Firstly, we reduce the heterogeneity between treated and control groups before the Covid-19 shock using a PSM weighted DID. This procedure requires the following steps. We identify the control group, running a logit model to calculate propensity scores of being a treated bank (high-ESG bank), employing all non-binary bank-level controls (Size, Roa, Cash_ta, Llr_gl, Eq_ta, Div) for the period before the pandemic outbreak (2019). We then match, without replacement, each treated bank to a control bank using the Caliper 10% matching (Chang et al., 2019).

Table 9 shows the final results of this approach (all intermediate passages are available upon request), confirming again the causal role played by ESG, ENV, SOC and GOV scores in reducing the detrimental impact of the pandemic. Moreover, it corroborates the importance of the SOC score in leading the magnitude of the ESG-CDS nexus.

[Insert Table 9 about here]

Finally, we run the DID regression (see Equation 2) a second time by considering two alternative days identifying the Covid-19 shock outbreak: i) the 24th of January, corresponding to the first Covid-19 case reported in Europe; and ii) the 17th of March, when all European countries had reported at least one case. This placebo test is useful to strengthen the validity of the selection of the 24th of February as the reference date for our analyses. We follow the same steps, interacting the treated group (banks above the top quartile of ESG scores) with two new dummy variables (respectively, First_Covid-19_cases or One_case_all_EU_countries).

Findings are in Table 10 and show that none of the alternatives is statistically significant: the choice of the 24th of February is robust.

[Insert Table 10 about here]

We run two additional tests to further stress the ESG-CDS relationship during the pandemic. Firstly (Table 11), as in Ding et al. (2021), we run Equation (1) by interacting each bank control variable with the Covid-19 cases, to explore if the ESG-CDS relationship is led by other factors rather than the social responsibility of firms. Table 11 shows again that ESG, ENV, SOC and GOV practices are negatively correlated to CDS, thus corroborating our baseline analysis. Interestingly, looking at the bank controls, our results are in line with the literature (see e.g., Chiaramonte et al., 2021) finding that asset quality (Llr_gl) and income diversification (Div) are those most relevant in reducing banks' riskiness, especially when interacted with the Covid-19 cases.

[Insert Table 11 about here]

Finally, we check the consistency of our results by running the following tests (in the Appendix): i) we re-estimate our econometric models using weekly, monthly, and quarterly CDS spreads (A.3); ii) we test if any statistically significant differences exists within the two different Covid-19 waves (A.4); iii) we run a sub-sample analysis comparing banks headquartered in countries with high supervisory powers (H_Sup_Pow) to others (L_Sup_Pow), as defined by the World Bank database (Anginer et al., 2019), finding that the ESG-Covid-19-CDS relationship holds especially for banks subject to stronger supervisory regimes (A.5); iv) we test the effect of the pandemic-induced oil shock of March-April 2020 (sudden change in consumption and disruptive effects on global supply chains), finding no additional impact on the ESG-Covid-19-CDS relationship (A.6). All these tests confirm our main findings and their robustness.

Another concern about our results is a potential dependency from country-level differences in country-level social capital level or commitment towards sustainability. We assess this issue through interaction terms, by considering once more data provided by the World Bank and find no statistically significant differences in our results (available upon request).

Overall, our results reveal that being an ESG engaged bank has strategical implications even when unprecedented pandemic and related economic and social shocks occur. More precisely, we empirically demonstrate that the mechanism explaining the ESG-CDS spreads relationship, when considering the detrimental impact of stakeholder panic surrounding the pandemic outbreak, is the creation of moral capital in the form of a trust signal to stakeholders. Results are consistent both when we consider cross-country reported cases, and as a single event in a quasi-natural experiment. Finally, we also find that social aspects represent the main driver affecting the ESG-CDS spreads nexus.

6. Conclusions

The outbreak of the Covid-19 pandemic was an unexpected and unprecedented exogenous shock that radically changed the economic, financial, and social landscape worldwide. In this paper, we exploit this event to examine if the joint and separate effects of environmental, social, and governance scores (ESG) affect the riskiness of European banks.

We explore the moral capital theory and how banks originate trust through engagement, and as a result are perceived differently in terms of riskiness in the first semester of 2020, by means of cross-country model and a quasi-natural experimental design. Moreover, by scaling the power of a sentiment analysis based on big data obtained from Google Trends, we capture the economic mechanism explaining how stakeholders' panic is associated to banks' CDS spreads at different levels of ESG engagement.

To the best of our knowledge, this is the first paper combining (non)traditional and (non)financial data to understand the economic channel behind the ESG-risk nexus. We find that the higher are ESG, ENV, SOC, and GOV scores, the lower is a bank's risk. We show that the ENV and SOC pillars lead this relationship: signaling seems stronger when encompassing a lower exposure to polluting industries, engagement in environmental projects, or investing in green assets (ENV), as well as by enhancing the well-being of stakeholders, local communities, and employees' welfare (SOC). Results hold, and the role played by the social dimension are even stronger, when we adopt a quasi-natural experimental setting.

We do not find any significant bias in our results, which proved robust to several additional econometric tests and alternative measures of ESG scores, CDS spreads frequencies, different inception dates for the pandemic outbreak, or in-sample heterogeneity. Nevertheless, we recognize that the necessary aggregation procedures in ESG scores from specific providers may result in bias in some results (Berg et al., 2022). In our study, we try to mitigate this potential adverse effect by using alternative sources for sustainability data; however, results must be interpreted considering the persistence of ESG measurement heterogeneity across raters. Moreover, except for the quasi-natural experimental approach, our results must be understood as a correlation between ESG scores and bank stability. Finally, since our analysis is focused on the pandemic period, generalization of results in different scenarios requires further testing.

In terms of policy implications, our results are supportive of the increasing involvement of European regulators and supervisors (but also outside the EU, e.g., in the UK) in enhancing sustainability practices in the financial industry, in particular to combine environmental and climate change issues with social engagement activities. Moreover, the bank management should consider how the moral capital built through ESG engagement may provide resilience to both financial shocks, as shown in the literature, as well as exogenous non-financial ones, such as the Covid-19 pandemic that we examine here.

Future research could benefit from our paper in several ways. We strongly believe that numerous academic questions could be addressed by combining financial data with additional data sources, such as sustainability metrics or online human behavior. Additionally, exogenous shocks provide an ideal testing ground to understand the relationship between firms' financial and ESG performance and risks, bringing us closer to identifying a potential causality nexus. Moreover, we contribute our findings to the growing body of robust results supporting the positive role of sustainability engagement in banks, particularly for its risk-mitigating properties. Finally, as the quantity and quality of data improve over time, our hypothesis could be further tested in other geographical areas, as well as during shocks other than the recent pandemic.

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Table 1 - Variable name, definitions, and source.

This table describes the variables used in our baseline models, their definitions, and data sources.

Variable name	Definition	Source
CDS	Daily 5-year CDS spread.	Bloomberg database (Authors' calculation)
ESG	Environmental Social Governance (ESG) score is an overall industry, size and regionally weighted score based on the S&P Global Corporate Sustainability Assessment on (ENV), (SOC) and economic and corporate Governance (GOV) aspects.	S&P Global
ENV	Environmental score is an overall industry, size and regionally weighted score based on the S&P Global Corporate Sustainability Assessment on Environmental (ENV) aspects.	
SOC	Social score is an overall industry, size and regionally weighted score based on the S&P Global Corporate Sustainability Assessment on Social (SOC) aspects.	
GOV	Governance score is an overall industry, size and regionally weighted score based on the S&P Global Corporate Sustainability Assessment on Governance (GOV) and Economic (ECO) aspects.	
D_Covid-19	Dummy for the Covid-19 eruption equals 1 for period after 24th February 2020, and 0 otherwise.	Authors' calculation
Treated	Dummy equal to 1 for banks above the top quartile of ESG, ENV, SOC and GOV values in 2019, and 0 otherwise.	Authors' calculation
Covid-19 Cases	Number of daily Covid-19 cases by country as a percentage over total population in 2019.	European Centre for Disease Prevention and Control
Size	Natural logarithm of total assets.	Thomson Reuters database (Authors' calculation)
Eq_ta	Equity to total assets.	
Llr_gl	Loan loss reserves to gross loans.	
Roa	Return on asset.	
Cash_ta	Cash to total assets.	
Div	Non-interest income to net operating revenue.	
D_PEPP	Dummy equals to 1 for the period in which the European Central Bank (ECB) announced the pandemic emergency purchase programme (PEPP) (18th March 2020) and 0 otherwise.	Bloomberg database
D_Oil_Shock	Dummy equals to 1 for the period in which the oil price collapsed (from 5th March to 5th May 2020), and 0 otherwise.	

Figure 1- Daily Covid-19 cases by country

This figure shows the average daily Covid-19 cases scaled by the total population for each country represented in our sample. Source: ECDC Europe (https://www.ecdc.europa.eu/en.)

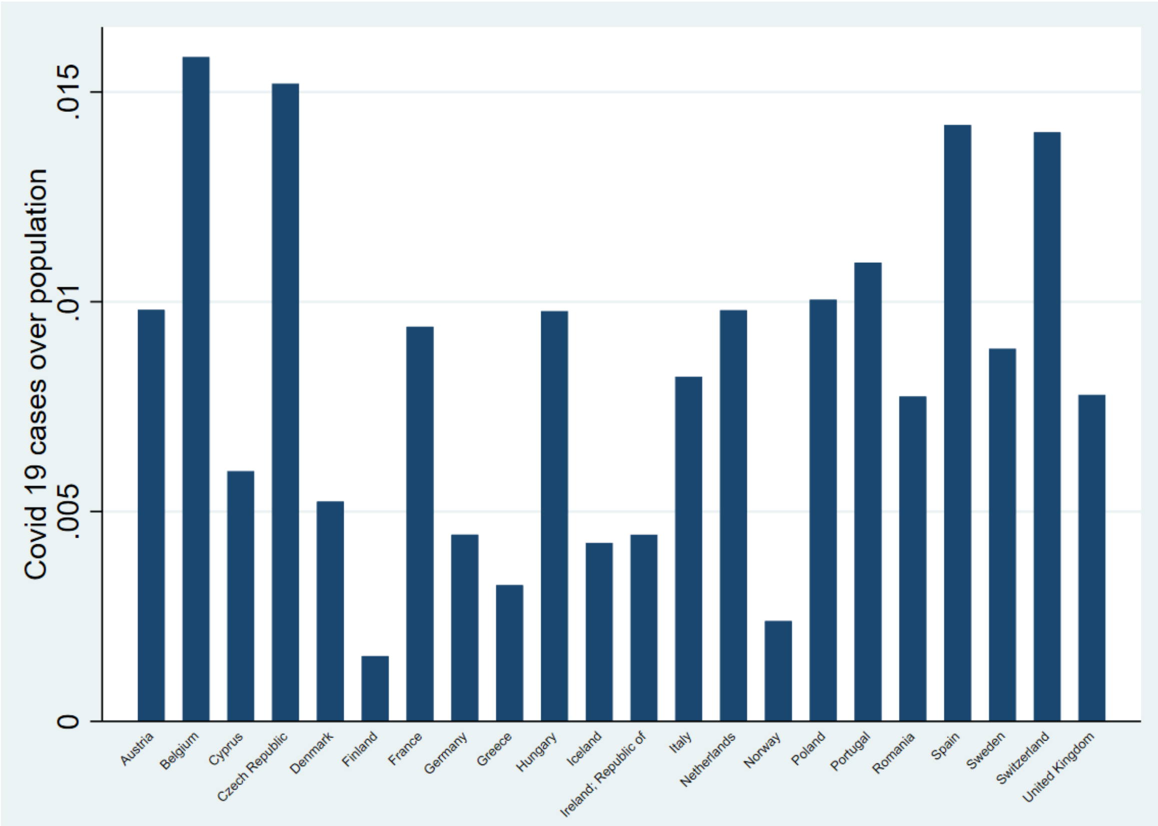

Figure 2- Daily Covid-19 cases in Europe in 2020

This figure shows the average daily Covid-19 cases, scaled by the total population (in 2019), for Europe and across 2020. Source: ECDC Europe (https://www.ecdc.europa.eu/en.)

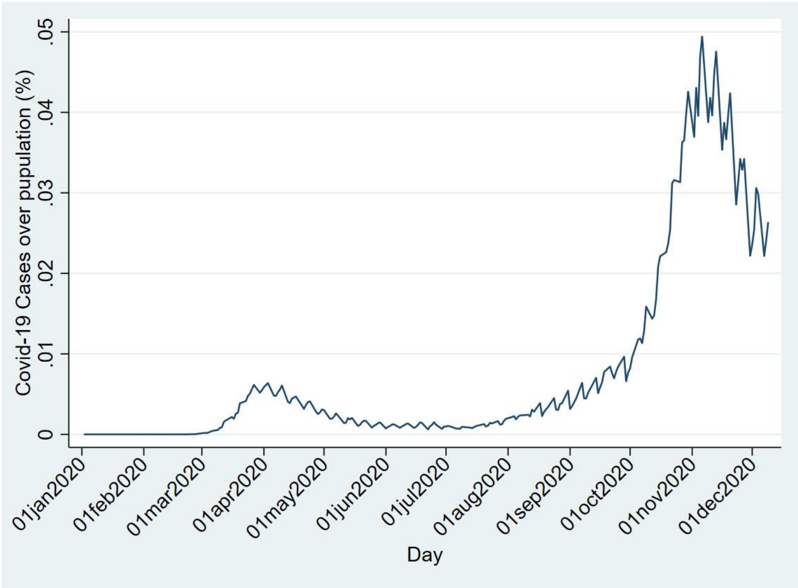

Table 2 – Summary statistics

This table reports the summary statistics (Mean, Median, standard deviation, first quartile, third quartile and maximum) of the variables included in our baseline models. Variable definitions are provided in Table 1. All control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail.

Variables	Minimum	First quartile	Mean	Median	Third quartile	Maximum	Standard Deviation
CDS	0.2	0.520	1.530	0.861	1.940	8.89	1.698
ESG	0.03	0.350	0.556	0.611	0.820	1	0.298
ENV	0.08	0.360	0.575	0.650	0.820	1	0.286
SOC	0.03	0.330	0.541	0.560	0.840	0.99	0.296
GOV	0.04	0.300	0.557	0.610	0.820	0.99	0.304
Covid-19 Cases	0	0	0.008	0.001	0.007	0.255	0.016
D_PEPP	0	0	0.001	0.001	1	1	0.043
D_Oil_Shock	0	0	0.080	0.020	1	1	0.271
Size	12.62	9.861	11.14	11.09	12.621	14.537	1.827
Roa	0.008	0.002	0.006	0.005	0.008	0.040	0.007
Cash_ta	.0002	0.038	0.110	0.081	0.145	0.758	0.101
Llr_gl	0.002	0.008	0.042	0.020	0.047	0.977	0.091
Eq_ta	0.0002	0.040	0.070	0.001	0.235	0.360	0.349
Div	-0.122	0.252	0.344	0.334	0.442	0.656	0.142

Table 3 – Baseline model

This table reports the estimates of the panel fixed effects regression for 2019-2020. The dependent variable is the CDS Spreads (CDS) which measures bank risk. The variables of interest are: the ESG score - column (I); and its three components (ENV, SOC and GOV) - columns (II), (III), and (IV), respectively. Each target variable is interacted with the Covid-19 cases variable (*Covid-19 Cases*). Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. The control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail. Bank and time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	CDS			
Variables	(I)	(II)	(III)	(IV)
ESG*Covid-19 Cases (-1)	-0.058**			
	(0.029)			
ESG (-1)	0.012			
	(0.011)			
ENV*Covid-19 Cases (-1)		-0.074**		
		(0.037)		
ENV (-1)		0.004		
		(0.005)		
SOC*Covid-19 Cases (-1)			-0.061**	
			(0.031)	
SOC (-1)			0.008	
			(0.008)	
GOV*Covid-19 Cases (-1)				-0.0516*
				(0.0276)
GOV (-1)				0.015
				(0.0134)
Covid-19 Cases (-1)	0.084***	0.088***	0.0859***	0.081***
	(0.028)	(0.0289)	(0.030)	(0.026)
D_PEPP	-0.383***	-0.384***	-0.383***	-0.383***
	(0.0720)	(0.0722)	(0.0721)	(0.0720)
D_Oil_Shock	0.592***	0.562***	0.564***	0.625***
	(0.199)	(0.197)	(0.193)	(0.209)
Size (-1)	-0.867	-0.800	-1.166	-0.714
	(2.071)	(2.165)	(2.201)	(1.939)
Roa (-1)	11.02	-1.894	2.461	17.34
	(26.84)	(19.64)	(21.43)	(31.34)
Cash_ta (-1)	-0.725	-1.150	-0.554	-1.233
	(1.305)	(1.241)	(1.172)	(1.244)
Llr_gl (-1)	11.82	7.353	8.077	14.64
	(18.24)	(16.83)	(17.28)	(18.82)
Eq_ta (-1)	0.165	0.314	0.272	0.223
	(0.635)	(0.499)	(0.559)	(0.572)
Div (-1)	-2.205*	-2.036*	-2.157*	-2.394*
	(1.136)	(1.136)	(1.167)	(1.238)
Bank FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
N. of obs.	5,554	5,554	5,554	5,554
R-squared	0.35	0.36	0.36	0.35

Table 4 - DID regression

This table provides the results of our DID strategy based on the Covid-19 outbreak (24th February 2020). The dependent variable is the daily CDS spreads (CDS) as a proxy for bank risk. Target variables are: D_Covid-19 equals to 1 for days after the 24th February 2020, and 0 otherwise; Treated that takes value of 1 for banks above top quartile values of ESG scores in 2019, and 0 otherwise (similarly for Treated_ENV, Treated_SOC, and Treated_GOV); their interaction term (Treated*D_Covid-19). Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. The control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	CDS			
Variables	(I)	(II)	(III)	(IV)
Treated*D_Covid-19	-0.168*			
	(0.0947)			
Treated	0.191			
	(0.261)			
Treated_ENV*D_Covid-19		-0.219***		
		(0.0698)		
Treated_ENV		-1.483		
		(1.821)		
Treated_SOC*D_Covid-19			-0.272***	
			(0.0711)	
Treated_SOC			-2.473	
			(2.556)	
Treated_GOV*D_Covid-19				-0.226**
				(0.0990)
Treated_GOV				-2.444
				(2.508)
D_Covid-19	0.930***	0.931***	0.941***	0.936***
	(0.0964)	(0.0951)	(0.0960)	(0.0962)
Controls (-1)	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
N. of obs.	7,559	7,559	7,559	7,559
R-squared	0.54	0.55	0.54	0.54

Figure 3 – Parallel Trends

This figure illustrates the behavior of the average daily CDS spread (CDS) before and after the shock (dashed black vertical line) (24th February 2020) for both the treated and the control group. The treated (control) group is represented by banks above (below) the top quartile values of ESG scores in 2019.

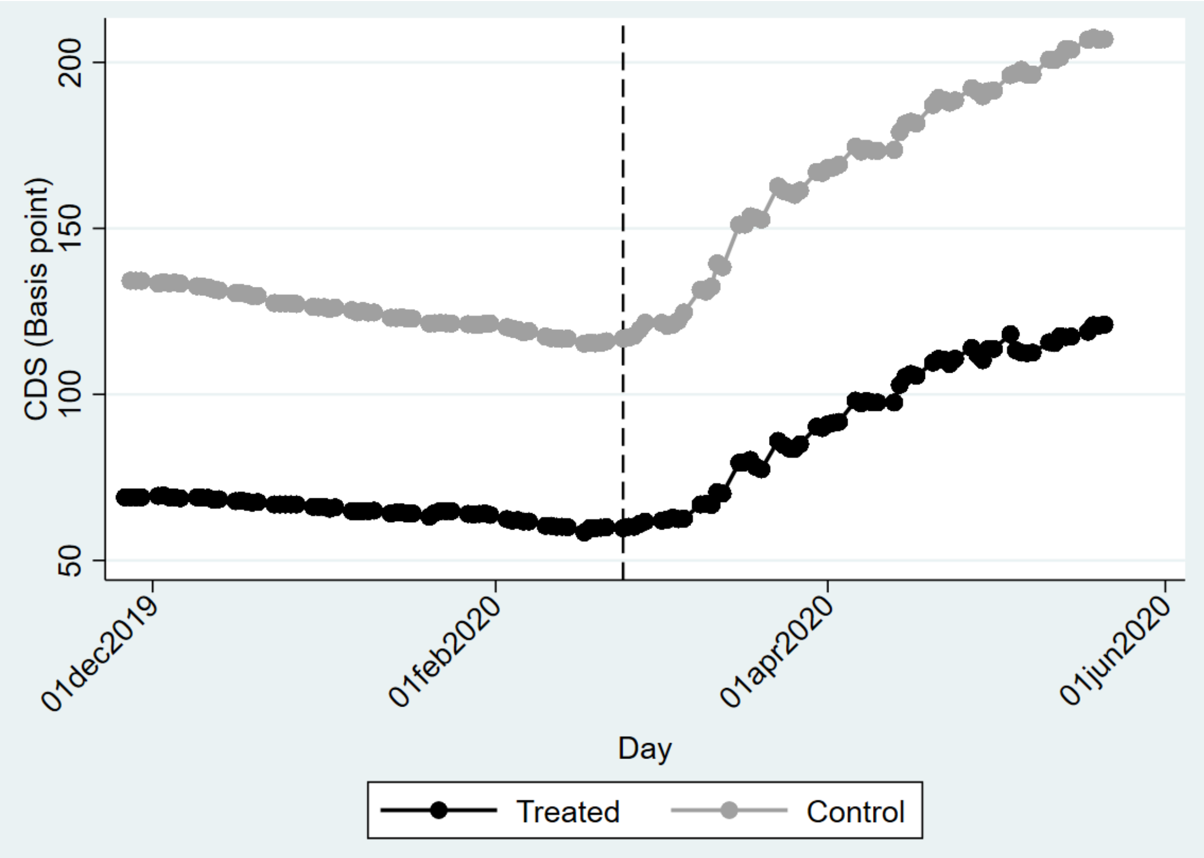

Figure 4 - Weekly "Covid-19" searches on Google in Europe in 2020

This figure shows the average weekly Covid-19 searches in Europe during 2020, with the maximum available frequency (weekly), scaled from the lowest (0) to the highest (100) ranking among searches.

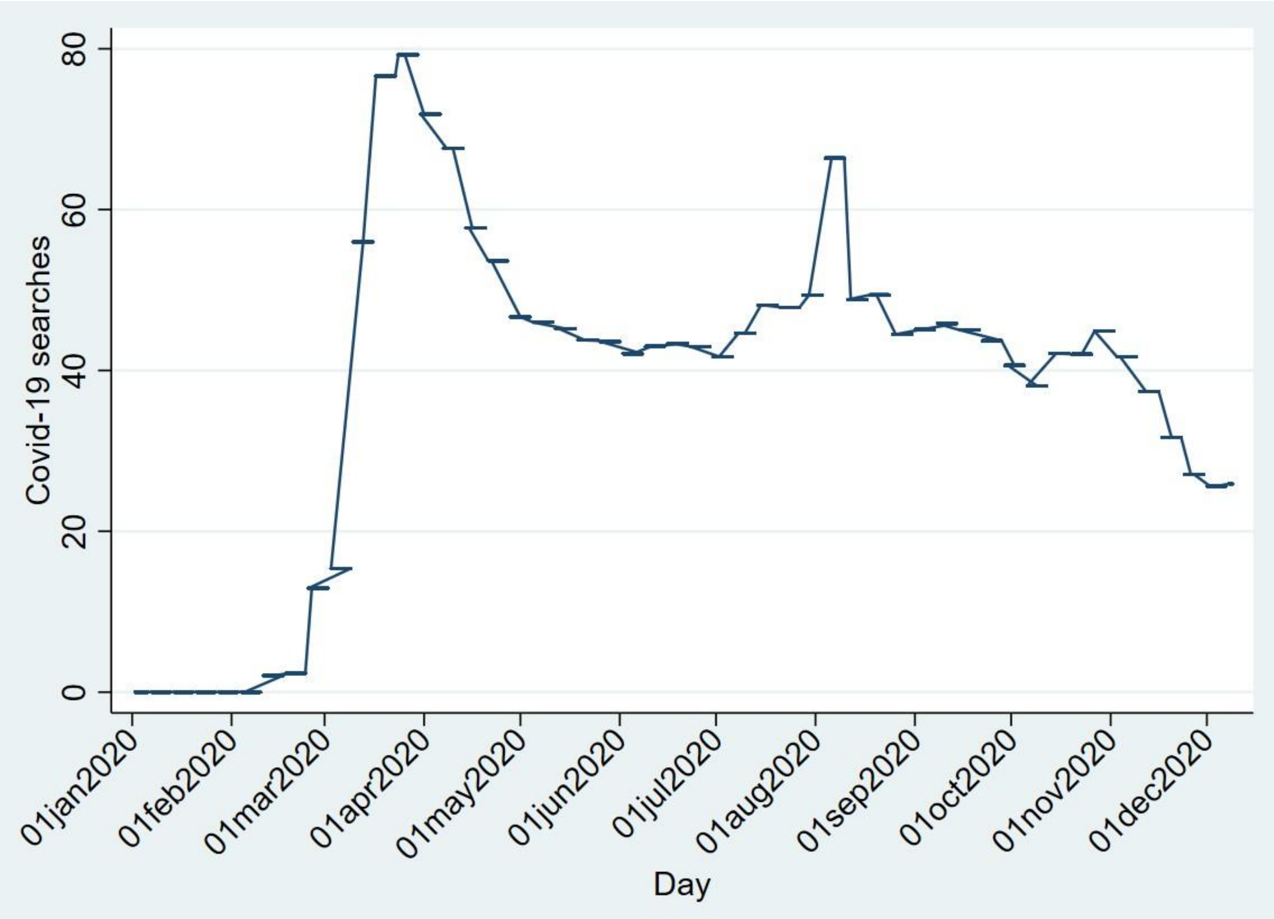

Table 5 – Google Trends analysis

This table reports the estimates of panel fixed effects regressions for 2019-2020. The dependent variable is the CDS Spreads (CDS) which measures bank risk. The variables of interest are: the ESG score - column (I); and its three components (ENV, SOC and GOV) - columns (II), (III), and (IV), respectively. Each target variable is interacted with the one measuring "Covid-19" searches on Google (Covid-19 Search). Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. Control variables are based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) and are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	CDS			
Variables	(I)	(II)	(III)	(IV)
ESG*Covid-19 Search (-1)	-0.001**			
	(0.004)			
ESG (-1)	0.232			
	(0.707)			
ENV*Covid-19 Search (-1)		-0.010**		
		(0.004)		
ENV (-1)		0.0261		
		(0.568)		
SOC*Covid-19 Search (-1)			-0.010**	
			(0.004)	
SOC (-1)			-0.482	
			(0.625)	
GOV*Covid-19 Search (-1)				-0.009**
				(0.004)
GOV (-1)				0.855
				(0.850)
Covid-19 Search (-1)	0.004	0.005	0.004	0.004
	(0.004)	(0.004)	(0.004)	(0.004)
Controls (-1)	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
N. of obs.	12,551	12,551	12,551	12,551
R-squared	0.39	0.40	0.38	0.39

Table 6 – The mediating role of Covid-19 searches (*Covid-19 Search*)

This table reports the estimates of panel fixed effects regressions for 2019-2020. Column (I) shows the model for the *Covid-19 Search*, with the number of Covid-19 cases (Covid-19 Cases) as the target variable. Columns II, III, IV, and V, show the results for the moderating role of *Covid-19 Searches* where the dependent variable is the CDS Spread (CDS), measuring bank risk. The variables of interest are: the ESG score - column (II); and its three components (ENV, SOC and GOV) - columns (III), (IV), and (V) respectively. Each target variable is interacted with the Covid-19 cases variable (*Covid-19 Cases*) and the "Covid-19" searches variable (*Covid-19 Search*). Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. The control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	Covid-19 Search	CDS			
Variables	(I)	(II)	(III)	(IV)	(V)
Covid-19 Cases (-1)	0.729*				
	(0.387)				
ESG*Covid-19 Cases*Covid-19 Search (-1)		-0.002***			
		(0.001)			
ESG*Covid-19 Cases (-1)		0.001			
		(0.001)			
ESG (-1)		1.266			
		(1.110)			
ENV*Covid-19 Cases*Covid-19 Search (-1)			-0.0013*		
			(0.0006)		
ENV*Covid-19 Cases (-1)			0.001		
			(0.009)		
ENV (-1)			0.811		
			(0.759)		
SOC*Covid-19 Cases*Covid-19 Search (-1)				-0.0014***	
				(0.0005)	
SOC*Covid-19 Cases (-1)				-0.0001	
				(0.0001)	
SOC (-1)				1.172	
				(0.991)	
GOV*Covid-19 Cases*Covid-19 Search (-1)					-0.0013***
					(0.0004)
GOV*Covid-19 Cases (-1)					-0.0005
					(0.006)
GOV (-1)					2.585
					(1.763)
Covid-19 Cases*Covid-19 Search (-1)		0.001***	0.001*	0.001**	0.001**
		(0.0004)	(0.0005)	(0.0004)	(0.0004)
Controls (-1)	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes
N. of obs.	13903	5,121	5,121	5,121	5,121
R-squared	0.39	0.40	0.38	0.39	0.40

Table 7 – Alternative measure of bank risk: 4 months and 1 year probability of default

This table reports the estimates of panel fixed effects regressions for 2019-2020. The dependent variables are the 4 months or the 1-year probability of default (4 months PD, 1 year PD) which measure bank risk. The variables of interest are: the ESG score - column (I); and its three components (ENV, SOC and GOV) - columns (II), (III), and (IV), respectively. Each target variable is interacted with the Covid-19 cases (*Covid-19Cases*). Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. The control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	4 months PD				1 Year PD			
Variables	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
ESG*Covid-19 Cases (-1)	-0.294**				-0.170***			
	(0.121)				(0.055)			
ESG (-1)	-0.157***				-0.0507			
	(0.058)				(0.0320)			
ENV*Covid-19 Cases (-1)		-0.281**				-0.214***		
		(0.130)				(0.075)		
ENV (-1)		-0.106*				-0.013		
		(0.061)				(0.254)		
SOC*Covid-19 Cases (-1)			-0.313**				-0.180***	
			(0.130)				(0.061)	
SOC (-1)			-0.121***				-0.07	
			(0.045)				(0.216)	
GOV*Covid-19 Cases (-1)				-0.273**				-0.143***
				(0.116)				(0.048)
GOV (-1)				-0.844				0.211
				(0.107)				(0.431)
Covid-19 Cases (-1)	36.86***	33.99***	37.80***	36.40***	20.87***	22.07***	21.40***	19.65***
	-9.126	-9.358	-9.418	-9.294	-4.967	-5.152	-5.186	-4.464
Controls (-1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. of obs.	5,444	5,444	5,444	5,444	5,554	5,554	5,554	5,554
R-squared	0.60	0.61	0.61	0.60	0.63	0.64	0.64	0.63

Table 8 – Alternative measure of ESG scores: Bloomberg

This table reports the estimates of panel fixed effects regressions for 2019-2020. The dependent variable is the CDS spread (CDS) which measure bank risk. The variables of interest are: the Bloomberg ESG score (BESG) - column (I); and its three components (BENV, BSOC and BGOV) - columns (II), (III), and (IV), respectively. Each target variable isinteracted with the Covid-19 cases (*Covid-19 Cases*). Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. The control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail. Bank and Time fixed- effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively,in two-tailed tests.

	CDS			
Variables	(I)	(II)	(III)	(IV)
BESG*Covid-19 Cases (-1)	-0.200**			
	(0.084)			
BESG (-1)	-0.046*			
	(0.025)			
BENV*Covid-19 Cases (-1)		-0.153*		
		(0.085)		
BENV (-1)		-0.046		
		(0.035)		
BSOC*Covid-19 Cases (-1)			-0.129	
			(0.105)	
BSOC (-1)			-0.018	
			(0.013)	
BGOV*Covid-19 Cases (-1)				-0.264***
				(0.089)
BGOV (-1)				-0.023
				(0.018)
Covid-19 Cases (-1)	13.96***	10.67**	10.99**	20.20***
	(4.711)	(4.490)	(5.155)	(5.037)
Controls (-1)	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
N. of obs.	5,554	5,554	5,554	5,554
R-squared	0.36	0.36	0.35	0.36

Table 9 - PSM weighted DID regression

This table provides the results of our PSM weighted DID strategy based on the Covid-19 outbreak (24th February 2020). The dependent variable is the daily CDS spread (CDS) as a proxy for bank risk. Target variables are: D_Covid-19 equal to 1 for day after the 24th February 2020, and 0 otherwise; Treated, that takes value of 1 for banks above top quartile values of ESG scores 2019, and 0 otherwise (similarly for Treated_ENV, Treated_SOC, and Treated_GOV), and their interaction. Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. The control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	CDS			
Variables	(I)	(II)	(III)	(IV)
Treated*D_Covid-19	-0.168*			
	(0.0975)			
Treated	-0.160			
	(0.262)			
Treated_ENV*D_Covid-19		-0.182**		
		(0.0774)		
Treated_ENV		-1.380		
		(1.824)		
Treated_SOC*D_Covid-19			-0.283***	
			(0.0683)	
Treated_SOC			-1.937	
			(1.729)	
Treated_GOV*D_Covid-19				-0.182*
				(0.0984)
Treated_GOV				-1.358
				(1.652)
D_Covid-19	0.683***	0.646***	0.697***	0.690***
	(0.102)	(0.102)	(0.0985)	(0.102)
Controls (-1)	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
N. of obs.	7,527	7,527	7,527	7,527
R-squared	0.9	0.9	0.9	0.9

Table 10 - Placebo test: alternative days identifying the pandemic outbreak

This table provides the results of our DID strategy based on alternative days identifying the Covid-19 outbreak. The dependent variable is the daily CDS spread (CDS) as a proxy for bank risk. Target variables are: Treated, that takes value of 1 for banks above top quartile values of ESG scores 2019, and 0 otherwise; *First_Covid-19Case* takes value of 1 after the 24^{th} January 2020, and 0 otherwise (first case reported in Europe); the dummy variable *One_Covid-19Case_all_EU_countries* takes value of 1 for the day after the 17^{th} March 2020, and 0 otherwise (all countries have at least one reported case). The control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

Variables	CDS
Treated*First_Covid-19Case	-0.106
	(0.0673)
Treated*One_Covid-19Case_all_EU_countries	0.0418
	(0.0469)
Treated	0.173
	(0.264)
Controls (-1)	Yes
Bank FE	Yes
Day FE	Yes
N. of obs.	7,559
R-squared	0.55

Table 11– Banks controls and Covid-19 cases interaction.

This table reports the estimates of panel fixed effects regressions for 2019-2020. The dependent variable is the daily CDS spread (CDS) as a proxy for bank risk. The variable of interest is the ESG, ENV, SOC and GOV score as well as control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) interacted with the daily Covid-19 cases (Covid-19 Cases). Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. The control variables are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	CDS			
Variables	(I)	(II)	(III)	(IV)
ESG*Covid-19 Cases (-1)	-0.0776**			
	(0.0303)			
ESG (-1)	0.0109			
	(0.0101)			
ENV*Covid-19 Cases (-1)		-0.0706**		
		(0.0285)		
ENV (-1)		0.00444		
		(0.00548)		
SOC*Covid-19 Cases (-1)			-0.0820**	
			(0.0352)	
SOC (-1)			0.00722	
			(0.00710)	
GOV*Covid-19 Cases (-1)				-0.0773**
				(0.0303)
GOV (-1)				0.0141
				(0.0123)
Covid-19 Cases (-1)	10.72*	9.615	10.00	12.17*
	(6.453)	(6.162)	(6.973)	(6.382)
D_PEPP	-0.380***	-0.381***	-0.380***	-0.380***
	(0.0727)	(0.0728)	(0.0727)	(0.0727)
D_Oil_Shock	0.589***	0.562***	0.563***	0.618***
	(0.193)	(0.192)	(0.189)	(0.201)
Size*Covid-19 Cases (-1)	0.531	0.456	0.607	0.460
	(0.713)	(0.603)	(0.791)	(0.713)
Roa*Covid-19 Cases (-1)	-1.884	-5.703	-10.59	10.95
	(14.56	(16.43	(14.63	(14.14
Cash_ta*Covid-19 Cases (-1)	15.31	12.43	14.32	17.38
	(23.06)	(23.42)	(22.79)	(23.80)
Llr_gl*Covid-19 Cases (-1)	-4.466*	-3.949	-4.1113*	-5.005**
	(2.279)	(2.428)	(2.225)	(2.369)
Eq_ta*Covid-19 Cases (-1)	6.581	6.025	7.783	5.049
	(11.69)	(12.13)	(12.27)	(11.24)
Div*Covid-19 Cases (-1)	-2.727***	-2.301**	-2.697***	-2.911***
	(0.922)	(1.048)	(0.9029)	(0.949)
Controls (-1)	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
N. of obs.	5,554	5,554	5,554	5,554
R-squared	0.35	0.36	0.36	0.35

Appendix

Table A.1 – Correlation Matrix

This table shows the correlation matrix of the variables used in the empirical analysis over the period 2019-2020. Variable definitions are provided in Table1. All control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div)* are winsorized at the 1% of each tail. The symbol * indicates statistically significance at the 5% level.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	CDS	1													
2	ESG	-0.3229*	1												
3	ENV	-0.3863*	0.9375*	1											
4	SOC	-0.2933*	0.9886*	0.9308*	1										
5	GOV	-0.2942*	0.9859*	0.8807*	0.9609*	1									
6	D_PEPP	0.0029*	0.0088*	0.0086*	0.0089*	0.0029	1								
7	D_Oil_Shock	0.0663	0.0692	0.0671	0.0697	0.0663	0.1275	1							
8	Covid-19 Cases	-0.1026*	0.0965*	0.1029*	0.0893*	-0.1026	0.0225*	0.4508*	1						
9	Size	-0.1206*	0.4118*	0.4381*	0.4195*	-0.1206	0.0022	0.0175	0.0488*	1					
10	Roa	-0.0512*	-0.0639*	-0.0790*	-0.0565*	-0.0512	-0.0080	-0.0629*	-0.0169*	-0.3243	1				
11	Cash_ta	-0.0302*	0.2682*	0.3117*	0.2744*	-0.0302	0.0059	0.0461*	0.1154*	-0.0026	-0.1139*	1			
12	Llr_gl	0.1781*	-0.0112	-0.0477*	0.0394*	0.1781	-0.0005	-0.0040	0.0301*	-0.2091*	0.1908*	0.1823*	1		
13	Eq_ta	0.0572*	0.0440*	0.0969*	0.0891*	0.0572	0.0019	0.0152	0.0413*	-0.2441*	0.2758*	0.0506*	0.1494*	1	
14	Div	-0.0790*	-0.0948*	-0.0442*	-0.1091*	-0.0790	0.0019	0.0151	0.0117*	0.2822*	0.0130	-0.0546*	-0.2470*	-0.0795*	1

Table A.2 Sample description by country

This table provides the breakdown of observations at the country level.

Country	N. of Banks	%
Austria	3	1.32
Belgium	1	0.44
Cyprus	2	0.88
Czech Republic	2	0.88
Denmark	5	2.19
Finland	2	0.88
France	3	1.32
Germany	2	0.88
Greece	4	1.75
Hungary	1	0.44
Iceland	1	0.44
Ireland	3	1.32
Italy	11	4.82
Netherlands	2	0.88
Norway	5	2.19
Poland	10	4.39
Portugal	1	0.44
Romania	2	0.88
Spain	6	2.63
Sweden	4	1.75
Switzerland	4	1.75
United Kingdom	11	4.82
Total	85	100.00

Table A.3 – Alternative frequency of CDS spreads: weekly, monthly, and quarterly.

This table reports the estimates of panel fixed effects regressions for 2019-2020. The dependent variables are the weekly (I), monthly (II) and quarterly (III) CDS spreads (CDS) which measure bank risk. The variable of interest is the ESG score. Each target variable is interacted with the Covid-19 cases (Covid-19 Cases). Variable definitions are provided in Table 1. All non-binary independent variables are lagged by one year with respect to the dependent variable. The control variables based on accounting data (*Size*, *Roa*, *Cash_ta*, *Llr_gl*, *Eq_ta*, *Div*) are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	Weekly CDS	Monthly CDS	Quarterly CDS
Variables	(I)	(II)	(III)
ESG * Covid-19 Cases (-1)	-0.069**	-0.067**	-0.011*
	(0.030)	(0.032)	(0.058)
ESG (-1)	0.011	0.012	0.012
	(0.010)	(0.010)	(0.008)
Covid-19 Cases (-1)	11.12***	12.35***	22.78***
	(2.974)	(3.564)	(6.062)
Controls (-1)	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes
Time FE	Yes	Yes	Yes
N. of obs.	5,571	6,294	7,346
R-squared	0.37	0.38	0.51

Table A.4– Controlling for first vs second Covid-19 wave.

This table reports the estimates of panel fixed effects regressions for 2019-2020 during the first (from January to June 2020) and the second (from July to December 2020) Covid-19 wave. The dependent variable is the daily CDS spread (CDS) as a proxy for bank risk. The variable of interest is the ESG, ENV, SOC and GOV score interacted with the daily Covid-19 cases (Covid-19Cases), as well as its interaction with the dummy variable *First Wave* which takes value of 1 for the period from January 2020 to June 2020, and 0 otherwise. Variable definitions are provided in Table 1. All non- binary independent variables are lagged by one year with respect to the dependent variable. They are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE) are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%, 5%, and 10% levels, respectively, in two-tailed tests.

	CDS			
Variables	(I)	(II)	(III)	(IV)
ESG*Covid-19 Cases (-1) *First Wave	0.224			
	(0.185)			
ESG*Covid-19 Cases (-1)	-0.0770*			
	(0.0420)			
ESG (-1)	0.0145			
	(0.0134)			
ENV*Covid-19 Cases (-1) *First Wave		0.168		
		(0.157)		
ENV*Covid-19 Cases (-1)		-0.0880**		
		(0.0439)		
ENV (-1)		0.00688		
		(0.00720)		
SOC*Covid-19 Cases (-1) *First Wave			0.144	
			(0.179)	
SOC*Covid-19 Cases (-1)			-0.0751*	
			(0.0444)	
SOC (-1)			0.00978	
			(0.0102)	
GOV*Covid-19 Cases (-1) *First Wave				0.262
				(0.205)
GOV*Covid-19 Cases (-1)				-0.0703*
				(0.0370)
GOV (-1)				0.0185
				(0.0163)
Covid-19 Cases (-1)	9.983***	10.04***	9.831**	9.784***
	(3.844)	(3.307)	(4.061)	(3.683)
Controls (-1)	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes
N. of obs.	5,554	5,554	5,554	5,554
R-squared	0.39	0.40	0.38	0.39

Table A.5 – Subsample analysis: High vs Low country supervisory power

This table reports the estimates of panel fixed effects regressions for 2019-2020 comparing banks headquartered in countries with high supervisory power (H_Sup_Power), defined as above the mean value of supervisory power index provided by the World Bank (2019), vs others (L_Sup_Power) defined as below the mean value of supervisory power. The dependent variable is the daily CDS spread (CDS) as a proxy for bank risk. The variable of interest is the ESG, ENV, SOC and GOV score interacted with the dailyCovid-19 cases (Covid-19Cases). Variable definitions are provided in Table 1. All non- binary independent variables are lagged by one year with respect to the dependent variable. They are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE)are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%,5%, and 10% levels, respectively, in two-tailed tests.

	CDS							
Variables	H Sup_Pow	L_Sup_Pow	H Sup_Pow	L_Sup_Pow	H Sup_Pow	L_Sup_Pow	H Sup_Pow	L_Sup_Pow
	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)	(VIII)
ESG*Covid-19 Cases (-1)	-.167***	-0.0114						
	(.0207)	(0.0388)						
ESG (-1)	-0.008***	0.0574**						
	(0.0002)	(0.0279)						
ENV*Covid-19 Cases (-1)			-0.1803***	-0.0433				
			(0.039)	(0.0573)				
ENV (-1)			-0.008***	0.0269				
			(0.0004)	(0.0251)				
SOC*Covid-19 Cases (-1)					-0.1842***	-0.0184		
					(0.025)	(0.0359)		
SOC (-1)					-0.0070***	0.0386**		
					(0.0002)	(0.0188)		
GOV*Covid-19 Cases (-1)							-0.1559***	0.0054
							(0.0163)	(0.0337)
GOV (-1)							-0.0138***	0.0197
							(0.0003)	(0.0272)
Covid-19 Cases (-1)	11.42***	5.652*	12.05***	7.485*	12.27***	6.141*	10.99***	4.431*
	(2.328)	(3.160)	(3.317)	(3.984)	(2.334)	(3.209)	(2.269)	(2.323)
Controls (-1)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Day FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N. of obs.	2,310	3,244	2,310	3,244	2,310	3,244	2,310	3,244
R-squared	0.37	0.31	0.34	0.35	0.31	0.30	0.33	0.37

Table A.6 – Testing the moderating effect of the pandemic-induced oil shock

This table reports the estimates of panel fixed effects regressions for 2019-2020 testing the moderating role of Covid-19 induced Oil shock. The dependent variable is the daily CDS spread (CDS) as a proxy for bank risk. The variable of interest is the ESG, ENV, SOC and GOV score interacted with the daily Covid-19 cases (Covid-19Cases) and Oil Shock dummy variable. Variable definitions are provided in Table 1. All non- binary independent variables are lagged by one year with respect to the dependent variable. They are winsorized at the 1% of each tail. Bank and Time fixed-effects (FE) are included in all specifications. Bank clustered standard errors (SE)are reported in parentheses. The superscripts ***, **, and * denote coefficients statistically different from zero at the 1%,5%, and 10% levels, respectively, in two-tailed tests.

	CDS			
Variables	(I)	(II)	(III)	(IV)
ESG *Covid-19Cases (-1) *D_Oil_shock	0.142			
	(0.104)			
ESG *Covid-19Cases (-1)	-0.058**			
	(0.028)			
ESG (-1)	0.012			
	(0.011)			
ENV *Covid-19Cases (-1) *D_Oil_shock		0.141		
		(0.124)		
ENV *Covid-19Cases (-1)		-0.073**		
		(0.036)		
ENV (-1)		0.004		
		(0.005)		
SOC *Covid-19Cases (-1) *D_Oil_shock			0.095	
			(0.121)	
SOC * Covid-19Cases (-1)			-0.061**	
			(0.030)	
SOC (-1)			0.008	
			(0.008)	
GOV *Covid-19Cases (-1) *D_Oil_shock				0.172
				(0.111)
GOV *Covid-19Cases (-1)				-0.051*
				(0.026)
GOV (-1)				0.016
				0.013)
Covid-19Cases (-1)	0.084***	0.088***	0.086***	0.081***
	(0.028)	(0.028)	(0.030)	(0.026)
Controls (-1)	Yes	Yes	Yes	Yes
Bank fe	Yes	Yes	Yes	Yes
Day fe	Yes	Yes	Yes	Yes
Observations	5,554	5,554	5,554	5,554
R-squared	0.35	0.35	0.36	0.35