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Does being a responsible bank pay off? Evidence from the COVID-19 pandemic[☆]

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ABSTRACT

We investigate whether banks' initial responses during the first wave of the COVID-19 pandemic in supporting their customers, communities, and governments were perceived as value-enhancing by investors. Using a unique responsible banking measure for a sample of the largest US and European commercial banks, we find a negative relationship between responsible bank behavior and stock market performance, particularly in the first wave of the pandemic. We also find that riskier banks were affected more negatively if they behaved responsibly. Overall, our findings show that banks' responsible behavior during a crisis reduces, or at best is not relevant to, shareholder value.

1. Introduction

In this paper, we examine whether investors perceive responsible banking behavior as value-enhancing by utilizing the unique economic setting created by the COVID-19 pandemic. Specifically, we look at the link between the responsible behavior of banks during the first wave of the COVID-19 pandemic in supporting their customers, communities, governments, and their stock returns. To do so, we use a comprehensive and unique responsible banking measure, developed by Kara et al. (2022), which captures over 300 American and European banks' immediate responses to the COVID-19 crisis during the first wave of the pandemic. We examine the relationship between banks' responses to the COVID-19 pandemic and stock returns of the sample of banks during the

first wave of the pandemic (February–June 2020) and the end of 2020 (February–December 2020). Our key responsible banking variable, in the context of crises caused by the COVID-19 pandemic, is superior than generic responsibility measures, such as the commonly used environmental, social and governance (ESG) scores. This is because generic ESG measures are unlikely to capture the responsible behavior that a specific crisis, such as the COVID-19 pandemic, would necessitate. Moreover, since the COVID-19 pandemic was a sudden and unpredictable event, ESG scores that are established in the long-term may be inadequate in capturing the banks initial responses to the crisis.

Our research is relevant as one of the most debated questions in the literature is whether firms' corporate social responsibility (CSR) choices have the predicted effects on firm value (Gillan et al., 2021).¹

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¹ Banks' adoption of responsible banking practices is encompassed in the broader definition and activities of CSR, an issue that has dominated corporate management practice (Crane et al., 2015) and academic research agenda alike. When theorizing companies' behavior to explain CSR engagement, a key question is whether and why firms should choose maximization of shareholder value over stakeholder welfare. Accordingly, external drivers of CSR engagement are argued to be predominantly rooted in the stakeholder and institutional theories, whereas internal drivers of it are mainly explained by resource-based views and agency theories (Frynas and Yamahaki, 2016). The common denominator of these theories explaining CSR engagement is firms' dependency on and gaining approval from outside (such as society and governments) and inside stakeholders (such as employees and managers) to ensure their survival in the long term to maximize economic benefits and firm value. Overall, it is argued that CSR activities increase firm value when they align with the demands of the stakeholders (Hillenbrand et al., 2013; Bae et al., 2021). Banks' rationale for CSR engagement, and theories applied to explain this behavior by academic studies, are no different. See, for example, Galletta et al. (2022), who map the utilization of theories in the analysis of ESG performance in the banking industry literature.

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Theoretical studies examining this relationship argue that higher CSR performance increases firm value (Fatemi et al., 2015; Benabou and Tirole, 2010; Albuquerque et al., 2019). An ample number of studies provide empirical evidence on the positive impact of CSR on firm value. For example, studies demonstrate that firms with high CSR performance have higher returns (Hong and Kacperczyk, 2009; Edmans, 2011; Dimson et al., 2015),² even in periods of low trust (Lins et al., 2017) and economic policy uncertainty (Jia and Li, 2020). Studies also report positive abnormal returns and, therefore, an increase in firm value when analyzing the stock market reaction to CSR-related news (Deng et al., 2013; Flammer, 2015) and the issuance of green bonds (Tang and Zhang, 2020; Flammer, 2021).³

In contrast, there is counter-evidence regarding the link between CSR performance and firm value. For example, Di Giuli and Kostovetsky (2014) argue that expanding CSR policies leads to future stock underperformance and a long-term deterioration in profitability. Similarly, Masulis and Reza (2015) find that the stock market reacts negatively to the announcement of corporate philanthropic contributions, suggesting that this type of CSR activity is not valued by investors. In the UK, Humphrey et al. (2012) do not find any significant difference in the risk-adjusted performances of firms with high or low CSR activities.⁴ Moreover, Buchanan et al. (2018) show that during the 2007–2008 Global Financial Crisis (GFC), when agency conflicts became more severe, high-CSR-performing firms experienced higher declines in firm values.

Although there is a strand of studies examining these issues in the context of non-financial firms, there is a shortage of literature investigating the impact of CSR engagement and market-based firm value indicators in the banking sector. Nevertheless, some studies have looked at whether CSR activity increases bank performance using balance sheet-based measures, and there is overwhelming evidence pointing to a positive relationship between the two (Ciciretti et al., 2014; Cornett et al., 2016; Forcadell and Aracil, 2017).^{5,6} In contrast, Scholtens and Dam (2007) report that the financial performance of banks that apply the Equator Principles does not differ significantly from that of non-adopters, and Soana (2011) does not find a link between CSR activities and performance.

The COVID-19 pandemic, which caused an unprecedented shock to the economies and financial markets, has intensified discussions about whether CSR as a risk-mitigating strategy would protect firm value during a crisis (Albuquerque et al., 2020; Demers et al., 2021). In this respect, the circumstances created by this extreme event and the subsequent crisis provided a unique opportunity for an emerging strand of the literature to empirically test this hypothesis. The evidence provided by these studies is contradictory. Many studies report that firms with stronger CSR performance had better stock returns (Albuquerque et al., 2020; Ding et al., 2021; Garel and Petit-Romec, 2021; Lu et al., 2022; Zhai et al., 2022) and lower return volatility (Albuquerque et al., 2020; Ding et al., 2021) in comparison to firms with poor CSR engagement. In the same vein, Li et al. (2022) find that higher CSR initiatives enhance stability of the banks through increasing social capital and constraining aggressive risk taking during the COVID-19 pandemic period. Similarly,

² Other studies also include Boubakri et al. (2016), Ferrell et al. (2016), Walker et al. (2019) and Barko et al. (2022).

³ In a recent study, Orazalin, Ntim and Malagila (2024) find a strong relationship between actual greenhouse emissions and firm value. CSR performance is also found to reduce SEO flotation costs (Li and Wang, 2022).

⁴ Relatedly, Servaes and Tamayo (2013) find that firms that do not advertise CSR engagement either harm or do not affect firm value.

⁵ Other studies also include Jo et al. (2015), Mallin et al. (2014), Moufry et al. (2021), Simpson and Kohers (2002), Shen et al. (2016) and Wu and Shen (2013).

⁶ A strand of the literature also examines the link between CSR performance and bank risk-taking. See, for example, Anginer et al. (2018), Gangi et al. (2019), Chiaramonte et al. (2021), and Neitzert and Petras (2022).

Broadstock et al. (2021) find that high-ESG portfolios generally outperformed low-ESG portfolios during the COVID-19 pandemic period. Overall, these studies advocate that CSR performance has the potential to mitigate financial risk during a crisis, alleviating the adverse impact on stock returns. In contrast, Bae et al. (2021) and Demers et al. (2021) find no supporting evidence linking a firm's CSR performance to its stock performance during the COVID-19 pandemic-induced crisis and, thus, CSR does not seem to make firms more resilient in times when market uncertainty is high. Similarly, Yi et al. (2022) report that Chinese firms with more pre-crisis CSR engagement had worse crisis-period stock returns during the COVID-19 pandemic.

Against this background, we examine whether responsible banking behavior was valued by the markets during the initial stages of the COVID-19 pandemic. This initial period of the crisis (defined as the first wave in many countries) created a rare setting of national lockdowns and closure of borders to halt the transmission of the virus, which, inevitably, had a heavy impact on economies. The economic tremor caused was one of the largest since the Second World War (World Bank, 2020). Such an abrupt economic slowdown prompted governments to take measures to curb the severely adverse economic impact, and consequently, many implemented extensive fiscal and monetary measures to support their economies. A significant number of these measures, particularly those directed at credit markets and banking systems — such as debt payment deferrals and government-backed credit and liquidity facilities for firms — required banks' collaboration in order to be implemented swiftly and efficiently. As a result, it can be argued that environmental and support measures taken by governments to tackle the pandemic created a testing ground where banks had to make quick decisions. Especially during the initial phase of the pandemic in the first half of 2020, when economic uncertainty was extremely high, banks assumed the social responsibility to provide support to their national economies, customers, communities, and governments. In the context of the COVID-19 pandemic-induced crisis, banks' social responsibilities, in addition to supporting governments' measures, included maintaining the provision of essential payment services, providing liquidity to businesses, and accommodating distressed borrowers (Kara et al., 2022). Our methodological approach is similar to Lins et al. (2017) and Bae et al. (2021). We utilize a number of estimators, controlling for various bank financial characteristics, ESG factors, and country-fixed effects, as well as various robustness tests including instrumental variables (IV) and matched sample regressions using propensity score matching (PSM).

We find a negative relationship between responsible banking behavior and stock market performance during the period of the first wave of the pandemic. In other words, investors seemed to have penalized banks for their efforts to support customers, communities, and governments during this period. However, we rarely observe this relationship between responsible banking behavior and stock performance when we extend the analysis period to the end of 2020. In other words, investors did not seem to attach any value, either negative or positive, to banks' efforts to behave responsibly beyond the first wave of the pandemic. Our sub-sample analysis show that these results are valid both for the US and European banks.

We conduct analysis for each dimension separately to identify which dimensions of our responsible banking variable may be contributing to the banks' market performance. We find that banks introducing their own measures and providing more information influence the results the most. These activities may be perceived to carry additional costs for the implementing banks, and, therefore, may lead to a negative reaction from the market at a time of higher and uncertain business environment. In addition, we extend our analysis to risk effects by interacting our responsible banking variable with banks' loan portfolio risk, financial risk and return volatility. Our results show that riskier banks, which were more vulnerable during the COVID-19 pandemic shock, were penalized even more by the market if they invested in social responsibility behaviour during the pandemic.

Our main contribution to the literature is expanding the strand of the studies that examines whether CSR behavior is value-enhancing for banks, particularly during crisis periods. In particular, we provide empirical evidence to support the discussion that responsible behavior may act as a risk-mitigating strategy for firms during a crisis (Albuquerque et al., 2020; Demers et al., 2021). However, even though banks played a crucial role during the pandemic, there is a shortage of literature that aims to understand whether responsible banking behavior was valued by markets and investors during the COVID-19 pandemic crisis. Unlike the relative abundance of studies on the link between CSR and stock market performance, only Demir and Danisman (2021) provide, albeit limited, evidence for banks. As part of their analysis of how bank-specific factors impact on stock returns, they find that while banks' environment and governance scores did not have a significant impact, higher social and CSR strategy scores intensified the negative stock price reaction to the COVID-19 pandemic. However, one of the shortcomings of their study (and similar studies on non-financial firms) is that the proxies used to capture responsible behavior are often generic measures, typically in the form of ESG scores or performance. These measures cannot capture the type of responsible behavior that the COVID-19 pandemic environment necessitated. Therefore, it is questionable whether the results of these studies are reliable in answering the question of whether corporate responsible behavior was valued by investors during the crisis.

Supporting our proposition, Bae et al. (2021) also suggest that there is a potential disconnect between firms' pre-COVID-19 pandemic CSR ratings and their actual revealed preferences during the crisis. They conclude that one needs to be cautious about drawing unambiguous or unconditional inferences about the value of CSR during a crisis. Hence, it is paramount to use more specific measures that capture the responsible behaviors that were more relevant to the conditions of the COVID-19 pandemic as the crisis unfolded. Accordingly, we also contribute to the literature by providing the first empirical analysis to test the link between responsible banking behavior and stock market returns using a novel COVID-19-specific bank responsible behavior measure. In contrast, generic variables used to capture CSR behavior, such as the ESG scores, do not have the capacity to capture and measure the responsible behavior that a particular crisis may require.

Berger and Demirgüç-Kunt (2021) highlight that crisis, such as the COVID-19 pandemic, are sources of exogenous shocks that are employed as quasi-natural experiments to help address both existing and new research questions. From this perspective, we also contribute to the strand of the literature that examined the impact of the crisis caused by the COVID-19 pandemic on various outcomes.⁷ Relatedly, the sudden emergence of the COVID-19 pandemic, which had a devastating impact on the world economy, has provided a rare opportunity to explore whether banks' and other financial intermediaries' efforts to be more responsible are valued by the investors and financial markets. For example, in a recent study, Döttling and Kim (2022) find that the demand for socially responsible investments falls during economic downturns. Using COVID-19 as an economic shock, they find that funds with higher sustainability ratings experienced sharper declines in retail flows during the pandemic. Hence, it is important to shed more light on this relationship as value-enhancing socially responsible behavior has the potential to incentivize banks, through market discipline, to further adopt responsible behavior. Therefore, we contribute to this literature by providing novel empirical evidence utilizing the uncertain

environment caused by the COVID-19 pandemic. Echoing Döttling and Kim (2022) findings, we show that market participants do not reward banks' responsible behavior during critical times when there is a sudden need for providing support to the economy.

The rest of the paper is structured as follows. In the next section, we explain the particulars of the data, empirical models, variables, and methodology. We discuss our main findings in Section 3, and Section 4 concludes the paper.

2. Data and methodology

2.1. Sample and data sources

Our sample consists of 303 of the largest listed commercial banks in the US (205) and Europe (98). As of 2019, the total assets of the banks in our sample constituted more than 50 % and 60 % of all commercial banking assets in the US and Europe, respectively. We collect our data from various sources. First, we identify whether a bank has an ESG score (and its sub-components) reported in the 2019 Refinitiv Datastream because these indicators are indispensable as control variables in our modeling. We identify all US and European banks in Refinitiv Datastream with ESG available scores. Subsequently, we construct our novel responsibly banking measure for all banks in the sample by manually compiling the relevant textual information from their corporate web pages, including financial reports, corporate announcements, news, and other relevant documents. Finally, we obtain bank-specific financial data from the FitchConnect database.

2.2. COVID-19 bank response measure

To examine whether banks' responsible banking practices were valued by the market, we utilize *Responsible bank*, a unique measure created by Kara et al. (2022). This measure captures banks' specific responsible actions in response to the COVID-19 pandemic. *Responsible bank* is created by compiling textual self-reported information by banks (from their web pages, including documents such as reports, presentations, news and press releases, and speeches and announcements) on their response to the COVID-19 emergency during the first wave of the pandemic—between February 2020, and June 2020—when uncertainty was at its highest.⁸ Kara et al. (2022) use the UN Environment Programme Finance Initiative on Principles for Responsible Banking to identify the possible actions of responsible behavior and classify six types of banks' responses to the COVID-19 emergency as follows:

- 1) *Readiness to facilitate the policy actions taken by governments and central banks.* These policy actions include government-guaranteed loans, provision of liquidity, deferral of debt payments, and other measures that may have to be facilitated through the banking system. Banks are rated as 0, 1 and 2, based on the level of their participation, determined by the number of measures introduced in the country. A rating of 0 is assigned if a bank does not indicate participation in any measures introduced. We rate banks as 2 if they facilitate all the measures introduced in their respective countries. A rating of 1 is assigned to banks facilitating at least one of the measures.
- 2) *Proactiveness in introducing own measures in addition to policymakers' schemes.* These measures include actions such as payment breaks, interest rate freezes, increasing credit limits, providing additional credit, fee waivers, and payment facilitation. Banks are rated 0 if they do not record any points on aggregate. We then rank the banks based on their total

⁷ For example, studies examined as bank regulation (Duncan et al., 2022; Bitar and Tarazi, 2022; Dursun-de Neef et al., 2023), governmental support (Berger et al., 2021; Pancotto et al., 2023; Degryse and Huylebroek, 2023), lending (Dursun-de Neef and Schandlbauer, 2021; Park and Shin, 2021), non-performing loans (Ari et al., 2021), performance (Demirgüç-Kunt et al., 2021) and systemic risk (Duan et al., 2021; Borri and di Giorgio, 2022), 2021, among others.

⁸ We provide a detailed explanation of the calculation of *Responsible bank* in the Appendix A. You can also refer to Kara et al. (2022) for an extensive description of the processes and methods followed to create this measure. Note that Kara et al. (2022) termed the same variable as C19BRM rather than Responsible bank.

points and assign a rating of 2 for banks that are in the top third. All remaining banks take the value of 1.

- 3) Efforts to strengthen their equity capital for financial stability. These efforts include i) reducing or canceling executive bonuses and other remuneration, and ii) dividend payments, and share buyback schemes. Banks are rated 0 if they have not adopted any of the measures. They are rated 1 if they have taken one of them and 2 if they have taken both (i and ii).
- 4) Charitable actions to support the community. These include cash donations, equipment donations, facilitation of fundraising, and access to food and shelter programs. Banks are rated 0 if they not undertaken any charity or donation activity. Remaining banks are ranked and we assign a rating of 2 for banks that are in the top third. All others take the value of 1.
- 5) Actions to protect and support employees' health and safety. These include introducing flexible working arrangements, increasing workplace safety, suspending job cuts and redundancies, and offering other benefits such as health insurance, medical support, subsidized childcare, and extra resources for mental and physical well-being. Banks are rated 0 if they did not take any measures for this criterion. We then rank the banks based on their and assign a rating of 2 for banks in the top third. All remaining banks take the value of 1.
- 6) Actions to provide relevant information to customers during the uncertainty. These include support lines for dedicated information web pages about the COVID-19 pandemic, advice and guidance provided for applications to government measures. Banks are rated 0 if they have taken no measures, and 1 if they have provided at least one of them.

Subsequently, all the categories are aggregated for a comprehensive measure that takes a value between 0 and 11 for each bank. We also utilize a simplified version *Responsible bank 2* where each bank is given a rating of either 0 or 1 for the six sub-categories based on whether they have taken some action (i.e., 1) or no action (i.e., 0) in that specific category. We then aggregate these values which yields to a measure from 0 to 6 for each bank.

2.3. Empirical modelling

2.3.1. Baseline model

We estimate the following empirical model to test the impact of *Responsible bank* on excess stock returns during the first wave of the pandemic:

$$\text{Excess return}_i = f(\alpha + \text{Responsible bank}_i + B'\theta + F'\gamma) \quad (1)$$

where *Excess return_i* indicates abnormal stock returns of the banks for both for the first wave period and end of 2020. We define the first wave pandemic period as February 18–June 5, 2020, because this period is considered the most volatile period in stock markets (Bae et al., 2021). End of 2020 covers the period between February 18–December 31, 2020. We employ two proxies for both period of excess returns.

Our first proxy *Excess return* is based on the difference between stock returns and return of the country-specific market indices. Next, we have calculated cumulative abnormal returns by aggregating abnormal returns for our event windows for the first wave and the end of year 2020. For our second return proxy, *Market-adjusted excess return*, we estimate the market model using historical weekly returns of the banks and country-specific benchmark indices over the past five years (2015–2019) and compute expected returns for our event windows. Next, we calculate the abnormal return as the difference between actual stock returns and expected stock returns which are estimated based on the market model. Finally, we aggregate abnormal returns to calculate cumulative abnormal returns for our two event windows. We use benchmark indices of each country when computing all abnormal (excess) returns.

In Eq. (1), *Responsible bank* is the COVID-19 responsible banking measure ranging from 0 to 11. We also incorporate an alternative

measure for responsibility, *Responsible bank 2*, ranging from 0 to 6. *B* denotes the set of bank-specific control variables, including *Size*, *Net loans*, *Return on average equity (ROAE)*, *Deposits*, *Nonperforming loans*, *Equity*, *Tier 1 capital*, *Momentum*, and *Volatility*, and *F* denotes pre-COVID-19 ESG scores, including Refinitiv's environmental (*Environment*) and social (*Social*) pillar scores of the banks. In Table 1, we present the detailed definitions of the variables used in the analysis. We mainly employ OLS regressions to estimate the models, controlling for country-fixed effects. In all estimations, standard errors are corrected for heteroscedasticity.⁹ To identify which dimensions of *Responsible bank* may contribute to the market performance of the banks, we run our baseline model also for each of the six dimensions of *Responsible bank* separately. Furthermore, to address any endogeneity concerns, we also estimate regressions on a matched sample via propensity scores and 2SLS IV regressions. We explain these in the below sub-sections.

2.3.2. Matched sample regressions

Our analysis may suffer from selection bias for a few reasons. First, due to data limitations, we only include banks with a Refinitiv ESG rating in our sample. Second, some of the unobservable characteristics of the banks with higher responsibility scores (*Responsible bank*) may significantly differ from those with lower scores. To remedy these concerns, we employ a PSM technique, which allows us to compare the excess returns of two groups with similar characteristics. Specifically, we create two groups, *Treatment* and *Control*, based on their *Responsible bank* score and compare their excess returns in a multivariate setting. The *Treatment (Control)* group includes the banks with a *Responsible bank* score above (below) the median. In the first stage of the analysis, we calculate propensity scores to match firms in the *Treatment* group with the banks in the *Control* group using a nearest-neighbor algorithm with replacement and common support. We use one to two matching algorithm to avoid any small sample bias. We use all the control variables in the matching algorithm. We find matches for 140 banks in the *Treatment* group, and our final sample size reduces to 207 after employing the matching process. In the second stage of the analysis, we re-estimate the regression (Eq. 1) with only the matched sample.

2.3.3. 2SLS IV regressions

As another robustness check to address endogeneity, we employ 2SLS IV regression analysis. This is because although we control for several bank-specific control variables, including the governance variables and country-fixed effects, to capture both firm and control-level factors, our results may still be biased due to unobservable omitted variables that are excluded from the regression. To address this concern, we use two sets of instruments. First, we employ IV regressions by using *Initial environment*, *Initial social* and *UN signatory* as the instruments for *Responsible bank*. Prior studies suggest that initial (or first) environment and social scores of the corporations significantly determines their current responsible behaviour (Wang et al., 2020; Ozkan et al., 2023). Moreover, we suggest that signing United Nations (UN) Principles for Responsible Banking significantly signals banks' commitment to impactful social change by aligning their mission, vision and practices with local and global sustainable development goals. Given that COVID-19 is an exogenous shock to stock markets, there is no reason to expect a significant impact of these variables on stock returns during the COVID-19 period. Specifically, we first predict *Responsible bank* by incorporating country-level *Responsible bank* and other variables from the main regression equation into our analysis in the first stage and use predicted responsible bank measure (*Responsible bank pred*) in the second stage. It is likely that initial social and environment scores and UN signatory condition of the banks have a significant impact on bank-level

⁹ In alternative specifications, we also estimate our models without some of the outliers observed in the data, and the main results we report do not change. These results are available from the authors upon request.

Table 1
Definitions of the variables.

Variable	Definition
First wave excess return	Abnormal stock returns during the most volatile market period (February 18 – June 5, 2020). Abnormal stock return is calculated by subtracting the return of country benchmark index from stock returns.
End of 2020 excess return	Abnormal stock returns for 2020 (February 18 – December 31, 2020). Abnormal stock return is calculated by subtracting the return of country benchmark index from stock returns.
First wave market-adjusted return	Market model-adjusted stock returns during the most volatile market period (February 18 – June 5, 2020). The market model is estimated using 60 months of returns over 2015–2019 and the country benchmark index as the market return.
End of 2020 market-adjusted return	Market model-adjusted stock returns (February 18 – December 31, 2020). The market model is estimated using 60 months of returns over 2015–2019 and the country benchmark index as the market return.
Responsible bank	COVID–19 Bank Response Measure, taking a value between 0 and 11. It measures a bank's COVID–19 response based on the aggregate scores given in six subcategories: 1) facilitating government measures; 2) introducing own measures; 3) strengthening capital; 4) supporting communities; 5) protecting employees; and 6) providing information. The first five categories take a value of 0, 1 and 2 and the last category is given a value of 0 or 1.
Responsible bank 2	COVID–19 Bank Response Measure, taking a value between 0 and 6. It measures a bank's COVID–19 response based on the aggregate scores given in six subcategories: 1) facilitating government measures; 2) introducing own measures; 3) strengthening capital; 4) supporting communities; 5) protecting employees; and 6) providing information. All categories are given a value of 0 or 1.
Size	Natural logarithm of the total assets in US dollars in 2019.
Net loans	The ratio of net loans to total assets in 2019.
ROAE	Net income divided by average shareholders' equity in 2019.
Deposits	The ratio of total deposits to total assets in 2019.
Nonperforming loans	The ratio of nonperforming loans to gross loans in 2019.
Equity	The ratio of shareholders' equity to total assets in 2019.
Tier 1	The ratio of a bank's core tier 1 capital to its total risk-weighted assets in 2019.
Momentum	Annual abnormal stock return in 2019.
Volatility	Variance of the market-adjusted returns in 2019.
Environment	Environmental pillar score at the end of 2019 from Refinitiv.
Social	Social pillar score at the end of 2019 from Refinitiv.
UN signatory	Dummy variable equals 1 if the bank signed UN Principles of Responsible Banking and 0, otherwise.
Initial social	The first reported Social scores of the banks that are available on Refinitiv.
Initial environment	The first reported Environment scores of the banks that are available on Refinitiv.

This tables presents the definitions of the variables used in the study.

Responsible bank but is unlikely to have an impact on the excess stock returns of individual banks, which supports the relevance and exclusion criteria of the instruments.

In addition, we employ a second alternative instrument, the country average of our responsible bank measure excluding the focal bank (*Country average Responsible bank*), to check further robustness of results. This is used in the spirit of [Bhandari and Javakhadze \(2017\)](#) which argue that a firm's responsibility practices are influenced by other firms in the same local community. This is also a valid instrument as country average responsible bank measure is less likely to have an impact on our dependent variables.

2.3.4. Moderating effect of risk

One of the important factors considered by investors when making investment decisions during the COVID-19 pandemic period was the risk level of the companies. It is evident that several companies issued bankruptcy due to the sudden decline in economic activity, which in turn altered the risk tolerance of the stock market investors ([Didier et al., 2021](#); [Liu et al., 2021](#)). Accordingly, we also examine whether the risk levels of the banks moderate the relationship between *Responsible bank* and excess returns. Accordingly, we employ an interaction analysis using the following equation:

$$\begin{aligned} \text{Excessreturn}_i = & \alpha + \beta_1 \text{Responsible bank}_i + \beta_2 \text{Risk}_i + \beta_3 \text{Responsible bank}_i \\ & \times \text{Risk}_i + \text{Control variables}_i + \mu_i \end{aligned} \quad (2)$$

In [Eq. 2](#), *Risk* corresponds to three accounting and market risk proxies, namely *Equity*, *Nonperforming loans*, and *Volatility*. *Equity* is an inverse measure of risk, defined as the ratio of shareholders' equity to total assets. *Nonperforming loans* indicates the ratio of nonperforming loans to total loans. As a proxy for the market risk, we use *Volatility*, which is the variance of the market-adjusted returns in 2019. Other control variables are as previously defined.

2.4. Descriptive statistics

[Table 2](#) presents the descriptive statistics for all variables. We observe that the first wave and the end of 2020 excess returns for our sample banks are around -11.4% and -9.4% , respectively. These figures suggest that banks significantly underperformed the market both for the first wave and end of 2020. We observe a similar figure for our alternative market-adjusted cumulative return measure (*Market-adjusted return*). Our bank responsibility measure (*Responsible bank*) has a mean (median) value of 4.97 (5). We observe that some of the banks in our sample did not engage in any responsible action during the first wave of the pandemic. Regarding the Refinitiv *Environment* and *Social* scores, our sample banks have mean values of 19.34 and 40.33, respectively.

In [Table 3](#) we present the correlation matrix comparing our responsible bank measures to Refinitiv's environmental and social scores.¹⁰ We observe that the correlation coefficients between *Responsible bank* and *Environment* and *Social* are 0.48 and 0.55, respectively. These results are plausible as, naturally, one would expect similarities between banks' broader socially responsible behavior and their specific COVID-19 pandemic actions. At the same time, as the reported correlations are not high, these results provide evidence that our responsible banking measures are original and valuable in capturing the specific socially responsible actions that were necessary during the COVID-19 crisis beyond the environmental and social scores.

3. Empirical results

3.1. Main results

We present our main estimation results in [Table 4](#), showing the relationship between *Responsible bank* and stock returns both in the first wave and the end of 2020. The dependent variables are reported as *Excess return* in Columns 1 and 2 and *Market-adjusted excess return* in

¹⁰ We also provide a correlation matrix for all variables in Appendix B.

Table 2
Descriptive statistics.

Variable	N	Mean	Std. dev.	Min	Median	Max
First wave excess return (%)	303	-11.412	13.912	-56.958	-10.939	44.650
End of 2020 excess return (%)	303	-9.284	19.181	-54.076	-10.143	87.938
First wave market-adjusted return (%)	303	-10.321	13.282	-53.922	-10.284	34.383
End of 2020 market adjusted return (%)	303	-7.892	19.215	-53.327	-8.711	87.566
Responsible bank	303	4.966	2.624	0.000	5.000	11.000
Responsible bank 2	303	3.353	1.558	0.000	3.000	6.000
Size	303	16.932	1.645	14.398	16.523	21.655
Net loans (%)	303	66.781	14.630	2.570	71.180	94.740
ROAE (%)	303	10.203	4.212	1.160	9.970	34.120
Deposits (%)	303	71.242	15.349	0.020	76.020	97.030
Nonperforming loans (%)	303	2.248	5.041	0.000	0.670	50.140
Equity (%)	303	10.766	3.646	1.250	11.110	37.550
Tier 1 (%)	303	14.019	3.239	9.700	12.980	25.370
Momentum (%)	303	-4.034	21.983	-192.103	-4.224	151.690
Volatility (%)	303	6.265	3.139	2.121	5.571	36.394
Environment	303	19.338	30.500	0.000	0.000	92.340
Social	303	40.330	21.715	1.060	33.460	96.820
UN signatory	303	0.138	0.000	0.000	0.000	1.000
Initial social	288	31.391	13.957	2.430	30.265	83.230
Initial environment	288	24.829	17.488	0.000	21.150	91.92

This table presents the descriptive statistics of the variables used in this study. Definitions of the variables are given in Table 1.

Columns 3 and 4. We find a negative and statistically significant coefficient for *Responsible bank* in Column 1, suggesting that banks that engaged in more responsible activities experienced negative stock returns in the first wave of the pandemic. This result is robust to the alternative (market-adjusted) measure of excess stock return (Column 3). One-point increase in our responsible bank measure leads to approximately 0.7 % decrease in excess and market-adjusted stock returns in the first wave of the pandemic. Our results contradict those of Albuquerque et al. (2020), who demonstrate that firms with higher CSR scores had higher stock returns during the COVID-19 crisis. They also differ from those of Bae et al. (2021), who show an insignificant relationship between CSR scores and the market performance of non-financial firms during the crisis period.

There are several factors that drive these inconsistent results. First, prior literature mainly focuses on non-financial firms, which have significantly different characteristics than banks. Second and more importantly, we incorporate a novel COVID-19-specific responsibility measure into our analysis. Interestingly, we do not find any significant relationship between the social pillar score from Refinitiv (*Social*) and the first wave stock returns. This result is in line with Bae et al. (2021). However, we have mixed evidence on the relationship between the environmental pillar score (*Environment*) and the first wave market performance of the banks. Specifically, the insignificant coefficient of *Environment* in Column 1 is negative and significant when we use *Market-adjusted excess return* as the dependent variable (Column 3). Regarding the control variables, we report that large and profitable banks outperformed the market during the first wave of the COVID-19 pandemic. On the other hand, banks with higher amounts of *Net loans* had lower excess returns. Other bank-specific control variables do not exert any significance in explaining the first wave excess returns.¹¹

We present the results for the end of 2020 excess returns in Columns 2 and 4. The results suggest that the negative impact of *Responsible bank* on excess returns prevails at the end of 2020, regardless of the

¹¹ We also conduct regressions analysis using alternative bank-characteristics control variables capturing the capital adequacy, asset quality, management efficiency, earnings quality and liquidity (i.e. CAMEL rating system). We estimate two alternative models using i) equity to total assets (C), nonperforming loans to total loans (A), cost to income ratio (M), net interest margin (E) and loans to customer deposits (L) and ii) Tier 1 capital (C), loan loss provisions to total loans (A), net loans to total loans (M), ROAE (E) and reserves and securities to total assets (L). The results, not reported for brevity and available from the corresponding authors, are consistent our main results.

alternative excess return measures.¹² Regarding the ESG scores, *Environment* displays a negative and significant coefficient, both in Columns 2 and 4, suggesting that market participants negatively reacted to engaging in environmental responsibility during the COVID-19 crisis. Similar to the first wave performance analysis, we do not find any significance in the *Social* scores of the banks in explaining the end of 2020 excess returns. Moreover, we find that larger and more profitable banks experienced positive excess returns by the end of 2020. Finally, we have mixed evidence for the impact of *Momentum* and *Risk* in determining the market performance of the banks.

In Table 5, we present results for the alternative responsibility measure, *Responsible bank 2*. The results support our previous findings in terms of the relationship between responsible banking and the first wave excess returns. Specifically, one-point increase in the *Responsible bank 2* leads to approximately 1.3 % decrease in excess returns in first wave of the pandemic. However, we do not find any significant impact on the end of 2020 performance, which suggests that the negative impact of responsible banking on stock returns diminished after a while. The results for the control variables are qualitatively similar.

In addition, we also estimate our model using a banking index benchmark, instead of the general market index, to derive abnormal (excess) returns. This is because it could be argued that if all banks in one country poorly performed during the COVID-19 pandemic, and worse than the general benchmark index, and at the same time when most of the banks behaved responsibly then results might potentially pick up a spurious relationship between the responsible banking behavior and stock market performance. We use MSCI World Banks Index as our benchmark when deriving abnormal returns. Results are presented in Table 6. We find that the main relationship observed with the general market index does not change. Furthermore, using the banking index, we also find the coefficient of *Responsible bank* weakly significant for the end of 2020 period.

Overall, our results suggest that responsible banks experienced a loss in market value, particularly in the first wave of the pandemic. Unreported results also suggest that our main findings regarding the relationship between *Responsible bank* and excess returns remain unchanged

¹² We also run our end of 2020 analysis by excluding the 1st wave period and calculating the excess returns for the period 8 June – 31 December. Results, reported in Appendix C, are not different from the main conclusions of our paper that the negative relationship between responsible banking behaviour and market returns is only observed during the 1st wave period.

Table 3
Correlation between Responsible bank measures and Refinitiv's Environment and Social scores.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)Responsible bank	1									
(2)Responsible bank 2	0.94	1								
(3)Own measures	0.70	0.67	1							
(4)Supporting employees	0.65	0.65	0.36	1						
(5)Government measures	0.62	0.56	0.31	0.15	1					
(6)Strengthening capital	0.41	0.38	0.14	0.24	0.26	1				
(7)Providing information	0.53	0.44	0.20	0.13	0.43	0.10	1			
(8)Donation	0.68	0.65	0.40	0.43	0.19	0.20	0.10	1		
(9)Environment	0.48	0.44	0.22	0.35	0.37	0.48	0.09	0.33	1	
(10)Social	0.55	0.50	0.27	0.40	0.34	0.50	0.16	0.42	0.87	1

This table presents the correlation coefficients between Responsible bank measures and Refinitiv's Environment and Social Scores. Definitions of the variables are given in Table 1.

Table 4
Responsible banking and market performance.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
Responsible bank	-0.007* (0.004)	-0.010* (0.006)	-0.007** (0.003)	-0.009* (0.005)
Size	0.026*** (0.009)	0.040*** (0.012)	0.037*** (0.008)	0.045*** (0.011)
Net loans	-0.002** (0.001)	-0.000 (0.001)	-0.002** (0.001)	0.000 (0.001)
ROAE	0.006** (0.002)	0.009** (0.004)	0.004* (0.002)	0.007* (0.003)
Deposits	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)
Nonperforming loans	-0.004 (0.004)	-0.012 (0.007)	-0.002 (0.004)	-0.008 (0.006)
Equity	0.003 (0.003)	0.005 (0.004)	0.004 (0.003)	0.005 (0.004)
Tier 1	0.003 (0.003)	0.001 (0.005)	0.003 (0.003)	0.002 (0.004)
Momentum	0.085 (0.061)	-0.018 (0.052)	0.036 (0.058)	-0.185*** (0.049)
Volatility	-0.206 (0.420)	1.016 (0.633)	0.178 (0.398)	1.515** (0.590)
Environment	-0.001 (0.001)	-0.002** (0.001)	-0.001** (0.001)	-0.003*** (0.001)
Social	-0.000 (0.001)	0.001 (0.001)	-0.000 (0.001)	0.000 (0.001)
Constant	-0.405* (0.211)	-0.861*** (0.318)	-0.556*** (0.186)	-0.982*** (0.274)
Country fixed	Yes	Yes	Yes	Yes
N	303	303	303	303
R ²	0.292	0.249	0.280	0.338

This table presents the impact of *Responsible bank* on market performance. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

when we include in our model several corporate governance factors, such as board size, board independence, board gender diversity, CEO-chair duality, and CEO compensation, which might have a significant impact on the banks' performance.¹³

¹³ We also run estimations without our responsible banking variable to test whether the same affect would be captured by the *Social* scores of ESG. We do not find a significant coefficient for *Social* score, indicating that our responsible banking variable captures the unique responsible behaviour required during the COVID-19 pandemic over the indicators of *Social* scores. In addition, we also estimate the model without any components of the ESG scores. Our responsible variable is still negative and significant in these settings. These results, not reported for brevity, are available upon request.

Table 5
Responsible banking and market performance: Alternative measure for responsibility.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
Responsible bank 2	-0.013** (0.006)	-0.013 (0.009)	-0.013** (0.006)	-0.013 (0.008)
Size	0.027*** (0.009)	0.038*** (0.013)	0.037*** (0.008)	0.044*** (0.011)
Net loans	-0.002** (0.001)	-0.000 (0.001)	-0.001** (0.001)	0.000 (0.001)
ROAE	0.005** (0.002)	0.009** (0.004)	0.004* (0.002)	0.007* (0.003)
Deposits	0.001 (0.001)	0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)
Nonperforming loans	-0.004 (0.004)	-0.012 (0.008)	-0.002 (0.004)	-0.008 (0.006)
Equity	0.002 (0.003)	0.004 (0.004)	0.004 (0.003)	0.005 (0.004)
Tier 1	0.003 (0.003)	0.001 (0.005)	0.003 (0.003)	0.003 (0.004)
Momentum	0.087 (0.061)	-0.019 (0.053)	0.037 (0.057)	-0.186*** (0.049)
Volatility	-0.217 (0.422)	1.020 (0.637)	0.166 (0.400)	1.516** (0.592)
Environment	-0.001 (0.001)	-0.002** (0.001)	-0.001** (0.001)	-0.003*** (0.001)
Social	-0.000 (0.001)	0.000 (0.001)	-0.000 (0.001)	0.000 (0.001)
Constant	-0.405* (0.213)	-0.845*** (0.319)	-0.556*** (0.188)	-0.969*** (0.273)
Country fixed	Yes	Yes	Yes	Yes
N	303	303	303	303
R ²	0.295	0.247	0.283	0.336

This table presents the impact of our alternative responsibility measure (*Responsible bank 2*) on market performance. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

3.2. Sub-components of Responsible bank

As discussed in Section 2.1, our *Responsible bank* measure consists of six sub-categories that might be perceived differently by the market participants. To identify which dimensions of *Responsible bank* may positively or negatively contribute to the market performance of the banks, we re-run our regression model for each dimension separately. Table 7 presents the results for the impact of individual components of *Responsible bank* on stock performance on the first wave and the end of 2020 (the results for control variables are not reported for brevity). First, we find that only *Own measures* and *Providing information* dimensions of the *Responsible bank* categories exert significance in negatively affecting the first wave excess returns. This implies that market participants negatively perceive banks that had a proactive strategy by introducing

Table 6
Alternative benchmark index – MSCI World Banks Index.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
Responsible bank	−0.008** (0.004)	−0.010* (0.006)	−0.009** (0.004)	−0.010* (0.006)
Size	0.026*** (0.009)	0.039*** (0.012)	0.040*** (0.009)	0.046*** (0.012)
Net loans	−0.002** (0.001)	−0.000 (0.001)	−0.002** (0.001)	−0.000 (0.001)
ROAE	0.006** (0.002)	0.008* (0.004)	0.005** (0.002)	0.006 (0.004)
Deposits	0.000 (0.001)	0.001 (0.001)	0.000 (0.001)	−0.000 (0.001)
Nonperforming	−0.004 (0.004)	−0.012 (0.007)	−0.002 (0.004)	−0.007 (0.006)
Equity	0.004 (0.003)	0.005 (0.004)	0.004 (0.003)	0.005 (0.004)
Tier 1	0.004 (0.003)	0.001 (0.005)	0.003 (0.003)	0.002 (0.004)
Momentum	0.093 (0.062)	−0.025 (0.055)	0.027 (0.063)	−0.196*** (0.052)
Volatility	−0.137 (0.426)	1.066 (0.662)	0.477 (0.437)	2.020*** (0.596)
Environment	−0.001 (0.001)	−0.002** (0.001)	−0.001* (0.001)	−0.003*** (0.001)
Social	−0.000 (0.001)	0.000 (0.001)	−0.000 (0.001)	0.000 (0.001)
Constant	−0.455** (0.208)	−0.817** (0.316)	−0.716*** (0.209)	−1.008*** (0.292)
Country fixed	Yes	Yes	Yes	Yes
N	303	303	303	303
R ²	0.392	0.245	0.308	0.340

This table presents the impact of *Responsible bank* on market performance which is based on excess returns over MSCI World Banks Index. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

their own measures, such as payment breaks, fee waivers, and interest rate freezes during the first wave of the pandemic. Given that introducing these measures is costly and may have a negative impact on the financial position of the bank, it is reasonable to find a negative association between *Own measures* and stock market performance. On the other hand, the *Providing information* dimension of *Responsible bank* includes offering support lines and COVID-19-specific websites and resources that may have been helpful for the customers in terms of having up-to-date information about the COVID-19 pandemic, especially in the uncertain environment during the first wave. However, these activities also carry additional costs to the implementing banks, which may lead to a negative reaction from the market, which depresses stock returns of the banks during the first wave. Regarding the end of 2020 performance, none of the sub-categories of *Responsible bank* except *Providing information* exert any significance in determining excess returns. The negative and significant coefficient of the *Providing information* dimension of *Responsible bank* in Columns 1 and 3 persists by the end of 2020 (Columns 2 and 4), albeit with a lower significance level.

3.3. Additional analysis and robustness checks

3.3.1. Matched sample regression results

In Table 8, we present the covariate balance test for the matches sample, which compares the differences in bank-specific factors in the *Treatment* and *Control* groups. The results show that mean differences for all variables between the *Treatment* and *Control* groups are insignificant, suggesting that the banks in the two groups share similar characteristics after the matching process. Matched sample regression results are presented in Table 9. They suggest that banks with higher *Responsible bank* scores experienced significantly negative excess returns in the first wave of the pandemic. However, this effect diminished by the end of 2020, as

Table 7
Subcategories of *Responsible bank*.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
Own measures	−0.037** (0.017)	−0.007 (0.023)	−0.041** (0.017)	−0.015 (0.021)
R ²	0.296	0.241	0.287	0.331
Supporting employees	−0.004 (0.019)	0.001 (0.024)	−0.002 (0.018)	0.008 (0.021)
R ²	0.284	0.241	0.271	0.330
Government measures	−0.023 (0.024)	−0.028 (0.038)	−0.024 (0.022)	−0.028 (0.034)
R ²	0.286	0.243	0.273	0.331
Strengthening capital	−0.011 (0.026)	−0.068 (0.053)	−0.026 (0.028)	−0.101* (0.058)
R ²	0.285	0.248	0.273	0.346
Providing information	−0.051** (0.022)	−0.062* (0.032)	−0.051** (0.021)	−0.056* (0.029)
R ²	0.297	0.251	0.284	0.338
Donation	−0.010 (0.017)	−0.018 (0.024)	−0.007 (0.016)	−0.010 (0.023)
R ²	0.285	0.242	0.271	0.330
Controls	Yes	Yes	Yes	Yes
Country fixed	Yes	Yes	Yes	Yes
N	303	303	303	303

This table presents the results for the impact of *Responsible bank* subcategories on market performance. In Columns 1 and 2, the dependent variables are first wave and end of 2020 abnormal returns. In Columns 3 and 4, the dependent variables are first wave and end of 2020 market-adjusted abnormal returns. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

evident by an insignificant coefficient of *Responsible bank* in Columns 2 and 4. These results confirm our earlier inferences. As a robustness check, we also employ matching without replacement, common support, and one-to-one matching algorithms. Moreover, we run our estimations using *Responsible bank 2* as the dependent variable. Our results remain unchanged.

3.3.2. 2SLS IV regression results

We present the first stage results of our first set of IVs in Table 10, Column 1. As expected, *Initial social*, *Initial environment* and *UN signatory* have a significant impact on bank-specific *Responsible bank*, which confirms our relevance assumption.¹⁴ The estimated coefficients of *Responsible bank pred* are negative and statistically significant in all models,¹⁵ suggesting that our main inferences regarding the relationship between *Responsible Bank* and the performance of the banks are valid after addressing the endogeneity due to omitted variables.¹⁶ Results of the second stage regressions are presented in Table 10, Columns 2–5. We find that the coefficient of *Responsible bank pred* is still negative but only

¹⁴ To further test the relevance assumption, we also report Kleibergen-Paap rk LM statistic which suggests that our endogenous variable is significantly determined by excluded instruments. Since we have more instruments than endogenous regressor, we also report Hansen J statistic which tests over-identification restrictions. Insignificant Hansen J statistics in all our models suggest that our instruments are valid and our model do not suffer from overidentification.

¹⁵ We also run 2SLS IV regression analysis using our alternative responsibility measure (*Responsible bank 2*). The results are qualitatively similar suggesting that banks engage in social responsibility during COVID-19 experience significant reduction in their market value, particularly in the first wave.

¹⁶ It may be argued that the control variables *Environment* and *Social* used in the analysis may be correlated with the *Initial social* and *Initial environment* IVs. To check robustness of our results, we also run our regressions excluding *Environment* and *Social*. Results remain unchanged. We do not report these for brevity and they are available from the authors upon request.

Table 8
Propensity score matching – Covariate balance test.

	High Responsible bank (Treatment)	Low Responsible bank (Control)	t-test (p value)	Variance ratio
Size	17.314	17.205	0.538	1.41
Net loans	66.812	69.068	0.138	1.17
ROAE	9.9654	10.358	0.453	1.28
Deposits	69.945	71.588	0.365	1.74
Nonperforming loans	2.6659	2.5317	0.855	1.07
Equity	10.609	10.645	0.932	1.11
Tier 1	13.846	13.497	0.407	0.81
Momentum	-0.042	-0.045	0.915	1.02
Volatility	.0645	0.060	0.280	2.10
Environment	24.504	21.125	0.381	1.21
Social	45.193	45.633	0.867	0.93

This table presents the covariate balance test for the treated (High Responsible bank) and control group (Low Responsible bank). Definitions of the variables are given in Table 1.

for the first wave period. These results are consistent with the baseline findings that responsible banking behaviour during the COVID-19 pandemic was only relevant in the short-term. Results for our second alternative IV, country average of our responsible bank variable, are presented in Table 11, both for first and second stage regressions. We find that the coefficient *Responsible bank pred* is still negative but only for the first wave period. These results are similar to our baseline findings.

3.3.3. Excluding “Strengthening Capital” dimension

Although our responsibility measure considers different stakeholders including customers, communities, employees as well as shareholders of the banks, it might be suggested that *Strengthening Capital* dimension (i. e. cancelling executive bonuses, cutting dividend payments) does not necessarily link to overall wellbeing of the society and also directly related to the stock performance of the bank. To alleviate these concerns, we generate an alternative responsibility measure (*Responsible bank 3*) which excludes strengthening capital dimension of responsibility measure and re-run our baseline regressions. Results, presented in Table 12, suggest that the negative relationship between responsible banking and first wave market performance holds, even after excluding the impact of financial actions taken by the banks. As a further robustness check, we also estimate IV regressions for *Responsible bank 3*. Untabulated results¹⁷ are qualitatively similar to that OLS regressions.

3.3.4. Sub-sample analysis

As discussed in Section 2.1, our sample consists of banks from the US and Europe. Although we control for country-fixed effects in all our regressions to capture any country-specific factors that may derive our results, the market reaction to engagement in responsibility may differ between US and European banks. Therefore, we re-run our regressions for US and European banks separately to observe any differences in the market reaction to *Responsible bank*.

We present the results of our sub-sample analysis in Table 13. We do not report the results for control variables for brevity. We observe a negative and significant coefficient for *Responsible bank* for both samples when our dependent variable is *First wave excess return*. We also test the significance of differences in the coefficient of *Responsible bank* between US and European banks. Un-tabulated results¹⁷ suggest that there is no difference in the impact of *Responsible bank* on excess stock returns between the two sub-samples. Therefore, we can confirm that engaging in social responsibility during the first wave of the COVID-19 pandemic

Table 9
Regressions with matched samples.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
Responsible bank	-0.008** (0.004)	-0.010 (0.006)	-0.007* (0.004)	-0.007 (0.006)
Size	0.025** (0.012)	0.046*** (0.015)	0.038*** (0.011)	0.059*** (0.014)
Net loans	-0.001 (0.001)	0.000 (0.001)	-0.000 (0.001)	0.001 (0.001)
ROAE	0.008*** (0.003)	0.009** (0.005)	0.006** (0.003)	0.005 (0.004)
Deposits	0.000 (0.001)	0.002 (0.002)	0.000 (0.001)	0.001 (0.002)
Nonperforming loans	-0.004 (0.004)	-0.013* (0.008)	-0.001 (0.004)	-0.006 (0.006)
Equity	0.003 (0.004)	0.004 (0.005)	0.002 (0.004)	0.004 (0.005)
Tier 1	0.007* (0.004)	0.003 (0.006)	0.007* (0.004)	0.006 (0.006)
Momentum	-0.041 (0.079)	0.008 (0.112)	-0.060 (0.076)	-0.118 (0.104)
Volatility	-0.148 (0.500)	0.396 (0.848)	0.049 (0.440)	0.485 (0.828)
Environment	-0.000 (0.001)	-0.003** (0.001)	-0.000 (0.001)	-0.003*** (0.001)
Social	-0.001 (0.001)	0.001 (0.001)	-0.001 (0.001)	0.000 (0.001)
Constant	-0.459 (0.314)	-1.101*** (0.406)	-0.660** (0.292)	-1.351*** (0.377)
Country fixed	Yes	Yes	Yes	Yes
N	207	207	207	207
R ²	0.303	0.264	0.318	0.314

This table presents the impact of *Responsible bank* on market performance using a matched sample. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

had a negative impact on bank market performance for both US and European banks. However, we do not have conclusive evidence for this relationship for the end of 2020 period.

3.3.5. Sub-components of Refinitiv’s environment and social scores

Bae et al. (2021) suggest that individual components of Morgan Stanley Capital International (MSCI) and Refinitiv ESG scores have a mixed impact on the performance of non-financial firms during the first wave of the pandemic. Although we control for both Refinitiv’s *Environment* and *Social* scores in all our specifications, it is useful to test whether any sub-components of the *Environment* and *Social* scores provide significance in explaining the stock returns during the pandemic. To do so, we drop Refinitiv’s *Environment* and *Social* scores from our regression model. We instead include three sub-categories of the environmental (*Resource use*, *Emission*, and *Innovation*) and four sub-categories of the social (*Workforce*, *Human rights*, *Community*, and *Product responsibility*) pillar scores in our models.

The results, presented in Table 14, provide several interesting implications. First, the negative and significant coefficients of *Responsible bank* suggest that COVID-19-specific responsibility continued to exert a negative influence on stock returns during the pandemic even after controlling for sub-categories of Refinitiv’s *Environment* and *Social* scores. Second, we find a negative and significant coefficient for *Innovation* components of the environmental pillar score. These results suggest that, particularly during the first wave of the pandemic, banks engaging in environmentally innovative practices experienced significantly lower stock returns than their peers. This implies that investors do not value environmental practices and investments during a health crisis. On the other hand, the positive coefficient of the *Community* dimension of the social pillar score (Columns 1 and 3) indicates that

¹⁷ Available from the authors upon request.

Table 10
2SLS IV Regressions with *UN signatory*, *Initial social* and *Initial environment* as instruments.

	First stage		Second stage		
	(1) Responsible Bank	(2) First wave	(3) End of 2020	(4) First wave	(5) End of 2020
UN signatory	1.445*** (0.489)				
Initial social	0.021* (0.012)				
Initial environment	-0.026*** (0.010)				
Responsible bank pred		-0.035** (0.017)	-0.046* (0.024)	-0.033* (0.017)	-0.038* (0.023)
Size	0.587*** (0.134)	0.045*** (0.013)	0.061*** (0.018)	0.053*** (0.012)	0.062*** (0.017)
Net loans	0.002 (0.010)	-0.002** (0.001)	-0.000 (0.001)	-0.001** (0.001)	0.000 (0.001)
ROAE	-0.068** (0.033)	0.003 (0.003)	0.006 (0.004)	0.002 (0.003)	0.005 (0.004)
Deposits	0.028** (0.012)	0.002* (0.001)	0.002 (0.002)	0.001 (0.001)	0.001 (0.001)
Nonperforming loans	-0.047 (0.048)	-0.004 (0.004)	-0.013* (0.007)	-0.001 (0.004)	-0.009 (0.006)
Equity	0.059 (0.047)	0.005 (0.003)	0.008* (0.004)	0.006** (0.003)	0.007* (0.004)
Tier 1	-0.086* (0.046)	0.002 (0.004)	-0.002 (0.005)	0.002 (0.004)	0.000 (0.005)
Momentum	0.750 (0.586)	0.119* (0.063)	0.021 (0.060)	0.059 (0.062)	-0.163*** (0.053)
Volatility	-3.301 (4.713)	-0.431 (0.423)	0.753 (0.615)	0.009 (0.408)	1.368** (0.575)
Environment	0.013 (0.010)	-0.001 (0.001)	-0.002** (0.001)	-0.001* (0.001)	-0.003*** (0.001)
Social	0.012 (0.014)	0.000 (0.001)	0.002 (0.001)	0.000 (0.001)	0.001 (0.001)
Constant	-4.803 (3.111)				
LM Statistic		13.003***	13.003***	13.003***	13.003***
Hansen J		0.454	2.300	0.634	2.461
N	288	288	288	288	288

This table presents the 2SLS IV regression results. Column 1 reports first stage regression results. We use *UN signatory*, *Initial social* and *Initial environment* as the instrument for *Responsible bank* at bank level. In Columns 2 and 3, the dependent variables are first wave and end of 2020 abnormal returns. In Columns 4 and 5, the dependent variables are first wave and end of 2020 market-adjusted abnormal returns. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

Table 11
2SLS IV Regressions with *Country average Responsible bank* as instrument.

	First stage		Second stage		
	(1) Responsible Bank	(2) First wave	(3) End of 2020	(4) First wave	(5) End of 2020
Country average Responsible bank	0.578*** (0.110)				
Responsible bank pred		-0.028*** (0.010)	-0.008 (0.013)	-0.023** (0.010)	-0.007 (0.013)
Control variables	Yes	Yes	Yes	Yes	Yes
First stage F statistic	25.24				
N	300	300	300	300	300
R ²	0.439	0.186	0.084	0.142	0.153

This table presents the 2SLS IV regression results. Column 1 reports first stage regression results. We use *country average responsibility* measure as the instrument for *Responsible bank* at bank level. In Columns 2 and 3, the dependent variables are short and long-term abnormal returns. In Columns 4 and 5, the dependent variables are short and long-term market-adjusted abnormal returns. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

Table 12
Excluding “Strengthening Capital” dimension.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
<i>US Banks</i>				
Responsible bank 3	-0.006* (0.003)	-0.009 (0.006)	-0.006* (0.003)	-0.007 (0.005)
Controls	Yes	Yes	Yes	Yes
R ²	0.291	0.247	0.278	0.335
N	303	303	303	303

This table presents the results using alternative responsibility measure. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

banks committed to public health and ethical practices were more likely to have positive returns during the first wave of the pandemic. However, this positive impact diminished by the end of 2020, as evident by an insignificant coefficient of *Community* (Columns 2 and 4). Turning to the impact of other components of ESG scores on end of 2020 performance, only the *Innovation* component has a negative and significant coefficient for determining the excess returns when we use market-adjusted excess returns as the dependent variable. This also supports the findings of [Bae et al. \(2021\)](#), which suggest that the majority of the Refinitiv and MSCI ESG scores do not exert any significance in explaining the stock returns

of non-financial firms during the post-pandemic period.¹⁸

3.3.6. Moderating effects of risk

Table 15 presents the results of the interaction analysis for moderating effects of risk. In these regressions, our main emphasis is on the coefficients of the interaction terms. For brevity, we do not report the results for the control variables. In Panel A of Table 15, we use *Equity* as our proxy for financial risk. The positive coefficient of the interaction term (*Responsible bank x Equity*) in Column 1 suggests that the negative impact of *Responsible bank* on first wave excess returns is significantly mitigated by having higher levels of equity. However, this coefficient is insignificant when we use market-adjusted excess returns (Column 3). On the other hand, negative coefficient of *Responsible bank x Nonperforming loans* in Column 1 suggests that banks with higher levels of nonperforming loans are more negatively affected than their peers if they behaved more responsibly during COVID-19.

Turning to the interaction effects of *Responsible bank* and risk proxies for the end of 2020 excess returns (Columns 2 and 4), we observe that having higher levels of equity significantly moderates the relationship between *Responsible bank* and excess returns (Panel A). On the other hand, the coefficients of the interaction term in Panels B and C are negative and significant for the end of 2020 (Columns 3 and 4). This implies that banks with higher levels of non-performing loans and stock volatility significantly underperformed the market and their peers if they acted more socially responsibly during the pandemic.

Overall, our results suggest that riskier banks were penalized by the market by the end of 2020 if they behaved more responsibly during the pandemic. One plausible explanation to these findings is that riskier banks are more vulnerable to external shocks, and during a crisis like the COVID-19 pandemic, investors may view investments on socially responsible behaviour as costly and unnecessary. This leads to a selling pressure on the stocks of responsible banks, which, in turn, lowers their stock prices.¹⁹

3.3.7. Limitations of our analysis

Our responsible banking measure may have some limitations. First, banks may have not provided the full information regarding their COVID-19 pandemic actions. Particularly, actions that may impact their reputation and/or business. Second, the self-reported information could be biased or not reliable. It is important to note that such issues are also pertinent to other well-known ESG related which also rely on publicly available information reported by the companies themselves. However, there are other data providers, such as the RepRisk or MarketPsych Analytics, which use non-firm related sources to generate ESG scores. Ideally, and for future research, it would be useful to create alternative variables using these sources and test the same hypotheses. Although, it is questionable whether it would be possible to calculate a COVID-19 response specific variable from these sources for each bank as the time-period for the first wave of the pandemic is very short, and, therefore, would rely on a limited number of sources. Secondly, as our measure is specific to what banks could have done to help their

¹⁸ We also run estimations without our responsible banking variable to test whether the same affect would be captured by the Social scores of ESG. We do not find a significant coefficient for Social score indicating that our responsible banking variable captures the unique responsible behaviour required during the COVID-19 pandemic over the indicators of Social component of ESG scores. In addition, we also estimate the model without any components of the ESG scores. Our responsible variable is still negative and significant in these settings. These results, not reported for brevity, are available upon request. In addition, we estimate our model without the Social and Environment variables. Results, presented in the Appendix D, remain similar.

¹⁹ In alternative estimations, we also interacted bank size and Social score with responsible bank variable to test whether these moderate the impact. We do not find any significant interaction terms. Results, not reported for brevity, are available upon request.

Table 13
Subsample analysis.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
<i>US Banks</i>				
Responsible bank	-0.007* (0.004)	-0.005 (0.006)	-0.007* (0.004)	-0.003 (0.005)
Controls	Yes	Yes	Yes	Yes
R ²	0.162	0.270	0.178	0.268
N	205	205	205	205
<i>European Banks</i>				
Responsible bank	-0.015** (0.006)	-0.002 (0.013)	-0.014** (0.006)	-0.002 (0.012)
Controls	Yes	Yes	Yes	Yes
R ²	0.420	0.214	0.286	0.306
N	98	98	98	98

This table presents the results for US and European banks subsamples. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1%, 5%, and 10%, respectively.

Table 14
Refinitiv's environment and social dimensions sub-components.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
Responsible bank	-0.008** (0.004)	-0.010* (0.006)	-0.008** (0.003)	-0.010* (0.006)
Resource use	-0.115 (0.076)	-0.063 (0.126)	-0.057 (0.076)	0.019 (0.127)
Emissions	0.134* (0.068)	-0.009 (0.103)	0.079 (0.074)	-0.062 (0.095)
Innovation	-0.105* (0.061)	-0.136 (0.083)	-0.122** (0.059)	-0.200** (0.082)
Workforce	-0.065 (0.056)	-0.047 (0.076)	-0.092* (0.055)	-0.082 (0.070)
Human rights	-0.001 (0.061)	-0.040 (0.089)	-0.017 (0.056)	-0.078 (0.092)
Community	0.062* (0.036)	0.060 (0.058)	0.069* (0.035)	0.079 (0.057)
Product responsibility	-0.020 (0.041)	0.068 (0.071)	-0.028 (0.042)	0.043 (0.066)
Constant	-0.415* (0.224)	-0.825*** (0.313)	-0.527*** (0.199)	-0.883*** (0.267)
Controls	Yes	Yes	Yes	Yes
Country fixed	Yes	Yes	Yes	Yes
N	303	303	303	303
R ²	0.316	0.259	0.305	0.352

This table presents the results for the impact of Refinitiv Environment and Social dimensions on market performance. In Columns 1 and 2, the dependent variables are first wave and end of 2020 abnormal returns. In Columns 3 and 4, the dependent variables are first wave and end of 2020 market-adjusted abnormal returns. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1%, 5%, and 10%, respectively.

customers, communities and governments, variables created using these alternative databases would not capture an isolated COVID-19 specific response and would only encompass banks' all ESG responses. Nevertheless, we believe that the general conclusions of our paper would not differ substantially if these potential variables were created and used. This is because even if our variable may be skewed towards positive responses, we are still finding that banks' positive response during COVID-19 pandemic as value reducing. As variables that can be created using these alternative databases are more likely to capture also the potential negative ESG responses, they will only affect this relationship between the two variables negatively.

In addition, it is also important to acknowledge that the main

Table 15
Moderating effects.

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
<i>Panel A. Moderating effect of Equity</i>				
Responsible bank	-0.022** (0.009)	-0.047*** (0.014)	-0.018** (0.009)	-0.045*** (0.013)
Equity	-0.002 (0.003)	-0.007 (0.006)	0.000 (0.004)	-0.006 (0.006)
Responsible bank*Equity	0.001* (0.001)	0.003*** (0.001)	0.001 (0.001)	0.003*** (0.001)
R ²	0.301	0.276	0.285	0.361
<i>Panel B. Moderating effect of Nonperforming Loans</i>				
Responsible bank	-0.004 (0.004)	-0.003 (0.006)	-0.005 (0.004)	-0.001 (0.005)
Nonperforming loans	0.002 (0.005)	0.004 (0.011)	0.003 (0.005)	0.012 (0.010)
Responsible bank*Nonperforming loans	-0.001* (0.001)	-0.003** (0.001)	-0.001* (0.001)	-0.004*** (0.001)
R ²	0.301	0.276	0.285	0.361
<i>Panel C. Moderating effect of Volatility</i>				
Responsible bank	0.000 (0.007)	0.029*** (0.011)	-0.001 (0.007)	0.032*** (0.010)
Volatility	0.453 (0.836)	4.719*** (1.193)	0.703 (0.811)	5.434*** (1.087)
Responsible bank*Volatility	-0.117 (0.114)	-0.658*** (0.190)	-0.093 (0.111)	-0.696*** (0.178)
R ²	0.295	0.296	0.282	0.390
Controls	Yes	Yes	Yes	Yes
Country fixed	Yes	Yes	Yes	Yes
N	303	303	303	303

This table presents the results for role of *Equity*, *Nonperforming loans* and *Volatility* on the relationship between *Responsible bank* and market performance. In Columns 2 and 3, the dependent variables are first wave and end of 2020 abnormal returns. In Columns 4 and 5, the dependent variables are first wave and end of 2020 market-adjusted abnormal returns. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

conclusions of our paper are driven from banks' response to COVID-19 pandemic, which was a rare occurrence with specific challenges on the public health which required lock-downs. Hence, the responsibility actions needed for the COVID-19 pandemic may be different and specific in comparison to other ESG related shocks. Therefore, even though our findings are relevant to CSR in a broader sense, they are limited to circumstances that would require similar responses to COVID-19 pandemic.

4. Conclusion

The sudden and unexpected occurrence of the COVID-19 pandemic,

Appendix A

Construction of the *Responsible Banking* measure

In this section we summarise the procedure that Kara et al. (2022) used to calculate the Responsible Banking measure, labelled as C19BRM in their paper. For a full length of explanation please refer to their paper.

²⁰ In this context, banks also have a great potential to influence their customers' behavior regarding the environment and social responsibility. They can play a significant role in tackling the climate change as they are positioned at the center stage of economies, controlling the flow of funds and playing a key role in the distribution of credit in the economy. As they are directly connected to the providers and users of funds, they have a great potential to influence their customers' behavior regarding the environmental and social responsibility. Hence, responsible lending by banks may have significant externalities in achieving the long-term goals of tackling climate change and promoting sustainable economic growth.

with its devastating impact on the global economy, has provided a unique setting to examine the value of socially responsible behavior by companies. In this paper, we investigate whether banks' initial responses to the COVID-19 pandemic during the first wave in supporting their customers, communities, governments, and, in general the economy, were perceived as value-enhancing by investors. It is essential to shed more light on the value of banks' responsible behavior as they are positioned at the center stage of economies and play a key role in the distribution of funds that finance an economy.²⁰ We utilize a comprehensive and unique responsible banking measure that captures over 300 of the largest listed US and European commercial banks' immediate response to the COVID-19 crisis during the first wave. We examine the link between banks' response to the COVID-19 pandemic and their first wave and end of 2020 stock returns.

Our results show that banks' responsible behavior during the COVID-19 pandemic was value-destroying during the first wave. However, the impact of engaging in socially responsible behavior for the period end of 2020 on stock returns is less clear cut. Investors did not seem to attach value to banks' efforts to behave responsibly in supporting customers, communities, and governments for this period. We also find that for riskier banks responsible banking behavior is more value-destroying in comparison to less risky banks. As our sub-category analysis shows, our findings can be interpreted in the direction that some of the responsible banking actions taken by banks may have been seen as cost-generating activities impacting financial performance. Our conclusions are very much in line with the findings of Bae et al. (2021) and Döttling and Kim (2022) showing that market participants' demand for socially responsible behavior falls during economic crisis and downturns.

Our findings have broader policy implications. Today, an extensive global effort and resources are dedicated to combating climate change and other pressing environmental and humanitarian challenges. Firms, and their socially responsible behaviors, are situated at the forefront of this fight. They are expected to dedicate increasingly more resources to combating these challenges and positively impacting the environment and society. However, as the worth of firms is determined in the market within the shareholder value maximization model implemented in many countries, it is paramount that the responsible actions of firms are recognized, especially in crisis times, by market participants. Otherwise, losing sight of such efforts may encourage firms to move toward greenwashing in the future, when sustainability at all fronts of the economy will be needed the most. Overall, our results vouch for more incentives for investors in order to reward the socially responsible behaviors of banks and firms in market economies.

Data availability

Data will be made available on request.

In creating this measure Kara et al. (2022) use content analysis to extract information and follow a systematic process. They develop a framework by identifying the possible actions and responses that banks could take during the first wave of the unprecedented pandemic. To do so, they use the UNEP FI’s Principles for Responsible Banking which provides a framework for banks to develop approaches in implementing the agreed responsible banking principles and a list of COVID-19 measures adopted by signatory banks (UNEP, 2022). These two sources are used to identify the textual data points to be selected. They then collect the textual data relating to the identified possible responses manually by scraping the relevant textual data from the banks’ webpages (and relevant documents provided there). The relevant chunks of textual data is transferred into a spreadsheet and classified in to six categories as follows:

- 1) *Facilitating government measures*: During COVID-19 pandemic, countries introduced support measures such as including government-guaranteed credit and liquidity facilities, payment deferrals or reliefs. The effective implementation of these support measures largely depended on the banks facilitating their transmission to the wider economy. Prior to data collection, Kara et al. (2022) identify these measures at country level using the International Monetary Funds (IMF) *Policy Responses to COVID-19*. As the number of measures introduced by countries varies from two to four, they used a ranking method normalizing the banks’ response in facilitating these measures based on the location of the bank. Hence, for each country, banks are rated as 0, 1 and 2, based on the level of their participation, determined by the number of measures introduced in the country. A rating of 0 is assigned if a bank does not indicate participation in any measures introduced, 2 if they facilitate all the measures introduced in their respective countries, and 1 is assigned to banks facilitating at least one of the measures.
- 2) *Introducing own measures*: Banks have also been supporting their customers through their own means. These are grouped as: i) Payment breaks and interest rate freezes; ii) Flexibility for loans and mortgages by providing emergency loans/liquidity and increasing credit limits; iii) Fee waivers for services (including contactless payments, credit and debit cards, loan processing and early withdrawal of deposits); iv) Payment facilitation (through increased ATM withdrawal, mobile and contactless limits, and mobile cash services). For each bank, they allocate one point for each group of actions if the bank has taken one within that group. They assign only one point per group of actions. For example, if a bank takes two similar actions within the same group then it will still be assigned one point. Banks are rated 0 if they do not record any points on aggregate. Banks are then ranked based on their total points and a rating of 2 is assigned for banks that are in the top third. All remaining banks take the value of 1.
- 3) *Strengthening capital*: Banks can maintain or strengthen their capital levels to withstand the impact of the expected financial distress. To reserve capital, they can reduce or cancel: i) cash dividend payments and/or share buy backs schemes, and ii) bonuses/remuneration. Banks are rated 0 if they have not adopted any of these measures. They are rated 1 if they have taken one and 2 if they have taken both (i and ii).
- 4) *Supporting communities*: Charitable actions and donations (or other similar activities) are classified as follows: i) Monetary donations (to healthcare services, affected communities, retirement and children homes, and other related charities); ii) Equipment donations to hospitals and/or similar (including respirators, ventilators, face masks, gloves, protective equipment for hospitals or computers, and laptops to schools for online teaching); iii) Equipment donations to schools and/or similar (including computers and laptops to schools for online teaching); iv) Facilitating fund-raising through active contributions and/or supporting access to food and shelter programs for the most vulnerable. For each bank, one point is allocated for each group of actions. Hence, maximum points that could be achieved by a bank is four. If banks have not undertaken any charity or donation activity, they are rated 0. Remaining banks are ranked based on total points, and a rating of 2 is assigned for banks that are in the top third. All remaining banks take the value of 1.
- 5) *Protecting employees*: Banks took various measures to protect the health and safety of its employees as follows: i) Suspending job cuts/redundancies; ii) Providing flexible working environment (including supporting special leave with full or part pay, flexible holiday entitlement, and flexibility for working from home); iii) Enhancing working environment safety (extensive hygiene and cleaning measures in branches/offices and provision of protective equipment); iv) Offering other benefits (such as health insurance, financial support for childcare costs, flu vaccination and other medical support, and resources for mental and physical well-being). For each bank, one point is allocated for each group of actions if the bank has taken one within that group, with four points being the maximum collected. Banks are rated 0 if they do not record any points on aggregate. Banks are then ranked based on their total points and assign a rating of 2 for banks in the top third. All remaining banks take the value of 1.
- 6) *Providing information*: This element encapsulates the willingness and efforts of banks to provide information to its clients. Kara et al. (2022) checks whether banks include COVID-19 support lines and/or dedicated COVID-19 information webpages on the help offered and application processes on government introduced measures and advice. They rate each bank as 0 and 1. Banks are rated 0 if they have taken no measures, and 1 if they have provided one of them.

In the final stage, Kara et al. (2022) convert textual data into numerical values manually, using content analysis, without the aid of any software packages. To test the objectivity of the scoring approach, they use Krippendorff’s alpha to assess the internal consistency of the calculated measure. To carry out the test, they randomly selected a sample of 30 banks (about 10 % of the sample) and calculate the Krippendorff’s alpha using the original scores with the two extra sets of scores produced independently by the authors. Results are reported to be higher (80 %) than commonly accepted threshold level. An example of coding for Bank X is presented below:

Chunks of data	Coding
“We are participating in a number of Covid–19 relief programmes to deploy a range of support measures for our customers at pace” “We have approved >118,000 applications for payment holidays for retail customers” “We have approved >£1.9bn of commercial lending for Covid–19 related financial support” “We have approved >4200 loans under the CBILS worth >£600 m” “We are committed to supporting businesses during these challenging times and have already provided customers with over £2.3 billion in support to help them through this outbreak. “We have been working at pace to deliver the Government backed schemes to ensure businesses are getting the funding they need” “We launched the Bounce Back Loans Scheme to support small and medium-sized businesses who have been affected by coronavirus (COVID–19).” “Announced new measures to support businesses by making CBILS more accessible for smaller companies and launching Coronavirus Large Business Interruption Loan Scheme for larger businesses” “We will reduce the minimum amount that sole traders and partnerships can borrow through CBILS from £25,001 to £10,000 to make it easier for smaller businesses to access liquidity”	Facilitating government measures: 2
“Rapid deployment of portals for relief measures; UK customers are able to apply for loans in <10 min” “Accelerated release of digital capabilities, including mobile authentication, mobile cheque deposits and online documents” “Ongoing investment in technology has enabled us to support customers” “Growth in lending balances in 1Q20 of \$16bn (5 %), as we support the liquidity and working capital needs of our customers” “Increase	Introducing own measures: 2

(continued on next page)

(continued)

Chunks of data	Coding
to existing overdraft buffer to £500 to help customers affected by COVID-19” “Further to introducing payment holiday options on mortgages, personal loans and credit cards, with an online application for credit cards going live tomorrow, we are providing additional support to millions of overdraft customers as they tackle the financial impact of Covid-19, the bank announced today” “Further to introducing payment holiday options on mortgages, personal loans and credit cards, with an online application for credit cards going live tomorrow, we are providing additional support to millions of overdraft customers as they tackle the financial impact of Covid-19”	
“We cancelled the 4Q19 interim dividend of \$0.21. We also decided to make no ordinary share dividend payments until the end of 2020” “We will make no quarterly or interim dividend payments or accruals in respect of ordinary shares, or undertake any share buy-backs in respect of ordinary shares”.	Strengthening capital: 2
“Our executive pay decisions in respect of 2020 will take into consideration the impacts of the pandemic”	
“A donation of £1 million to the National Emergencies Trust Coronavirus Appeal and British Red Cross to help support vulnerable people impacted by Covid-19” “Monies raised by the appeal are being distributed by the National Emergencies Trust to local Community Foundations and other charities so people dealing with the impact of illness, social isolation, or loss of income can get support as quickly as possible” “Aim to raise £2 million for The Big Night In Appeal”	Supporting communities: 2
“I take the well-being of our people extremely seriously. We have therefore paused the vast majority of redundancies to support our staff and to reduce the uncertainty they are facing at this difficult time” “We have put in place measures to better protect our employees’ health and safety while doing all we can to support our customers”.	Protecting employees: 2
“We have activated business continuity plans including in-country split-site operations and homeworking capabilities.”	
“Focus has been put on ensuring our digital, telephone banking and transactional infrastructure allows our customers to bank, invest, trade and access a wide range of products and services so as to provide continuity of service” “In these challenging times, our ability to support our customers with all their banking and financial needs is all the more important” Has a dedicated Covid-19 information webpage: “Coronavirus guidance: We know many of you are worried about how your finances might be affected by the coronavirus (COVID-19) pandemic. We’re working hard to make sure you have the support you need”	Providing information: 1

Source: Adapted from Kara et al. (2022)

Appendix B

Table B1
Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
(1)First wave excess return	1																
(2)End of 2020 excess return	0.53	1															
(3)First wave market adjusted	0.93	0.50	1														
(4)End of 2020 market adjusted	0.40	0.90	0.49	1													
(5)Responsible bank	-0.18	-0.05	-0.07	-0.01	1												
(6)Responsible bank 2	-0.20	-0.06	-0.11	-0.03	0.93	1											
(7)Size	0.02	0.11	0.15	0.15	0.55	0.50	1										
(8)Net loans	-0.17	-0.13	-0.23	-0.11	-0.18	-0.14	-0.43	1									
(9)ROAE	0.32	0.19	0.22	0.07	-0.20	-0.21	-0.13	-0.17	1								
(10)Deposits	0.00	-0.02	-0.08	-0.11	-0.15	-0.13	-0.51	0.31	0.16	1							
(11)Nonperforming loans	-0.11	-0.01	0.09	0.06	0.17	0.15	0.18	-0.14	-0.12	-0.09	1						
(12)Equity	0.00	-0.08	-0.06	-0.11	-0.20	-0.18	-0.47	0.29	-0.04	0.24	-0.13	1					
(13)Tier 1	0.10	0.09	0.15	0.15	-0.00	-0.02	0.17	-0.36	0.06	-0.34	0.16	-0.21	1				
(14)Environment	-0.04	-0.02	0.06	0.00	0.47	0.43	0.77	-0.40	-0.08	-0.56	0.27	-0.45	0.32	1			
(15)Social	-0.07	0.02	0.05	0.06	0.55	0.49	0.78	-0.34	-0.12	-0.52	0.26	-0.43	0.24	0.86	1		
(16)Momentum	0.09	-0.04	0.10	-0.19	0.01	0.01	-0.00	-0.05	0.081	0.10	0.42	-0.01	-0.07	0.01	0.00	1	
(17)Volatility	-0.13	0.07	0.04	0.17	0.08	0.07	0.11	-0.09	-0.12	-0.00	0.64	-0.25	0.08	0.07	0.12	0.35	1

This table presents the correlation coefficients between the variables used in the study. Definitions of the variables are given in Table 1.

Appendix C

Table C1
Alternative pandemic period – Excluding short-term impact of pandemic

	(1) Excess return	(2) Market-adjusted	(3) Bank index-adjusted
Responsible bank	-0.003 (0.005)	-0.002 (0.005)	-0.003 (0.005)
Size	0.015 (0.013)	0.005 (0.012)	0.015 (0.013)
Net loans	0.002* (0.001)	0.002** (0.001)	0.002* (0.001)
ROAE	0.001	0.000	0.001

(continued on next page)

Table C1 (continued)

	(1) Excess return	(2) Market-adjusted	(3) Bank index-adjusted
	(0.004)	(0.004)	(0.004)
Deposits	0.001 (0.001)	0.000 (0.001)	0.001 (0.001)
Nonperforming	-0.009 (0.007)	-0.008 (0.006)	-0.009 (0.007)
Equity	0.002 (0.004)	0.001 (0.004)	0.002 (0.004)
Tier 1	-0.004 (0.005)	-0.002 (0.005)	-0.004 (0.005)
Momentum	-0.133* (0.074)	-0.248*** (0.067)	-0.133* (0.074)
Volatility	1.601** (0.760)	1.717** (0.728)	1.601** (0.760)
Environment	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Social	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Constant	-0.566* (0.296)	-0.450 (0.288)	-0.495* (0.296)
Country fixed	Yes	Yes	Yes
N	303	303	303
R ²	0.263	0.319	0.272

This table presents the impact of *Responsible bank* on market performance for the period excluding the short-term impact of the pandemic. Specifically, return is calculated for the period 8 June – 31 December, 2020. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

Appendix D

Table D1
Excluding Refinitiv's environmental and social performance scores

	Excess return		Market-adjusted excess return	
	(1) First wave	(2) End of 2020	(3) First wave	(4) End of 2020
Responsible bank	-0.007** (0.004)	-0.011** (0.006)	-0.008** (0.003)	-0.011** (0.006)
Constant	-0.308 (0.217)	-0.663* (0.350)	-0.425** (0.194)	-0.707** (0.320)
Country fixed	Yes	Yes	Yes	Yes
N	303	303	303	303
R ²	0.281	0.225	0.258	0.292

This table presents the impact of *Responsible bank* on market performance excluding Refinitiv's environmental and social performance scores of the banks. Definitions of the variables are given in Table 1. Robust standard errors are in parentheses. ***, **, and * denote significance level at 1 %, 5 %, and 10 %, respectively.

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