Bond Short Selling and Climate Risk: Evidence from the CDS market

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Abstract

Does climate risk influence bond short selling? We address this question by studying how climate risk influences the relationship between corporate bond short selling and subsequent credit default swap (CDS) spreads. We find that bond short selling is strongly related to future CDS spreads for the high climate risk firms. In particular, our fixed effects difference-in-differences (DiD) regressions show that sensitivity of CDS spreads to lagged bond short selling is significantly higher for firms with high regulatory and physical risks (based on Sautner et al., 2023) in the eight-quarters following the Paris Accord of December, 2015. Specifically, the treated firms consist of those in the highest quartile of a given climate risk each quarter within a specific industry, while the control sample firms are propensity score matched lowest quartile firms for that quarter and industry. Our results are robust to (a) alternate short-selling measure (i.e. utilization ratio), (b) alternate exogeneous events involving Trump election 2016 and US withdrawal from the Paris Accord 2017, (c) alternate CDS maturities, (d) alternate climate risk proxies i.e., CDP scores and textual physical and transition risk measures (source: Li et. al., 2024, RFS), (e) placebo test, and (f) the staggered DiD regressions involving sequential implementation of US state climate adaptation plans. Further tests show that the effect of climate risk on the relationship between bond short selling and subsequent CDS spreads mainly holds for long-term bond maturities. Our findings contribute to the research on the role of climate risk in the informed trading in corporate bond markets.

Keywords: Climate risk, Credit default swap spread; bond short selling, The Paris climate agreement; US state climate adaptation plans.

JEL Classification: G00, G01, G10, G15

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1. Introduction

Short sellers are sophisticated informed investors who are expected to identify and incorporate credit risks into their portfolio decisions. The current literature suggests that short sellers contribute to price discovery in the corporate bond market (Hendershott et. al. 2019). Secondly, bonds are significantly exposed to downside risk from future climate policies and regulations (Sautner et. al. 2021). Corporate bonds investors in the US are predominantly institutional investors, who are likely to take carbon risks into account when investing in carbon-intensive assets (Duan et. al. 2023). Also, money managers have been using bond short selling as a tool to mitigate their carbon footprint, however the real impact of short selling on climate risk is not yet known. We fill this gap by examining how the climate risk influences the effect of bond sellers on the credit risk.

We examine whether the relationship between bond short selling and the CDS market for firms with higher climate risks are different compared to firms with lower climate risks. Short sellers are forward-looking informed traders and are expected to identify and incorporate carbon risk in their portfolio decisions. CDS spreads represent a forward-looking expectation of perceived risks. The CDS market is very liquid and reflects credit risks of a firm accurately. Climate risk affects security prices through investors' expectations of future valuation of the security and the uncertainty associated with it. Hence, if climate risk is priced in securities, the short sellers are expected to incorporate climate risks in their assessments. However, in the bond market, investors are found

to under react to climate risks (Duan, Li, and Wen 2023). Thus, this raises an interesting question: Are bond short sellers influenced by climate risk considerations?

We study the role of climate risk in the relationship between corporate bond short selling and subsequent credit default swap (CDS) spreads. We find bond short selling is strongly related to future CDS spreads for the high climate risk firms. In particular, our difference-in-differences (DiD) regressions show that sensitivity of subsequent CDS spreads to lagged bond short selling is significantly higher for firms with high regulatory and physical risks in the eight- quarters following the post-Paris Accord of 2015. Specifically, the treated firms consist of those in the highest quartile of a given climate risk each quarter, while control sample consists of propensity score matched lowest quartile firms for that quarter. Our results are robust to alternate (a) short-selling measure (i.e. utilization ratio), (b) exogeneous events involving Trump election 2016 and US withdrawal from the Paris Accord 2017, (c) CDS maturities, (d) climate risk proxies i.e., CDP scores and textual physical and transition risk measures (source: Li et. al., 2024, RFS), and (e) the staggered DiD regressions involving sequential implementation of US state climate adaptation plans. Further tests show that the relationship for bond short selling and subsequent CDS spreads mainly holds for long-term bond maturities. Overall, our findings inform that climate risk can significantly influence the relationship between bond short selling and subsequent CDS spreads.

2. Literature Review

This research contributes to the current literature in bond short selling market, informed trading in the bond market and the impact of climate risks on the corporate bond market.

Firstly, we contribute to the growing research on the effect of climate risk on corporate bond market. Corporate bonds investors in the US are predominantly institutional investors, who are likely take carbon risks into account when investing in carbon-intensive assets (Duan et al., 2023). Duan et. al., (2023) also find that corporate bonds of more carbon intensive firms earn significantly lower returns, contrary to the "carbon risk premium" hypothesis. Huynh and Xia, (2020) assert that bonds associated with a higher "climate change news beta" tend to deliver reduced future returns, while firms bearing substantial carbon footprints often receive lower credit ratings and face wider yield spreads (Seltzer et al. 2021). Following the Paris Climate Agreement of 2015, the disclosure of transition risks coincides with an increase in CDS spreads, whereas the revelation of physical risks correlates with decreased spreads (Wang et al., 2022). Furthermore, Sautner et al., (2021) find that bonds are significantly exposed to downside risk from future climate policies and regulations.

Secondly, we contribute to the extent literature on the informativeness of bond short selling market. Hendershott et. al., (2019) conclude that bond short sellers play a pivotal role in predicting future bond returns and serve as a crucial market discipline mechanism, curbing the profitability of insider trading activities (Chen et al., 2021). Lleshaj and Kocian, (2021) find that opening and increasing short positions are typically interpreted as conveying negative information, consequently leading to higher CDS spreads. Furthermore, bonds featuring CDS contracts exhibit more active lending compared to those without such contracts (Asquith et al., 2013). At the firm level, bond short interest is positively associated with one-month ahead CDS spreads (Kalimipalli et. al. 2023). Zhang et. al., (2013) find that equity short sellers provide predictive information to creditors in the bond market.

This paper investigates a sophisticated group of bond investors, short sellers and analyse how they react to climate risks of firms particularly considering the growing focus on climate risks by bond investors. On one hand, informed traders strategically employ bond short selling to assimilate their prior knowledge about climate risks. These forward-looking bond short sellers are well-positioned to identify and integrate carbon risk considerations into their portfolio decisions. Consequently, CDS markets should strongly react to bond short selling activities, particularly when comparing high climate risk portfolios to low-risk ones. Conversely, an alternative viewpoint posits that short sellers may disregard climate risks, thereby lacking any supplementary insights to impact credit markets. In this context, it is conceivable that CDS markets will not react to bond short selling activities especially when distinguishing between high and low climate risk profiles. Hence, we test our main hypothesis that the sensitivity of subsequent CDS spread to lagged bond short selling is significantly higher for high (vs low) Carbon Risk firms.

We decompose the aggregate climate risk into opportunity, regulatory, physical risks and risks associated with climate exposure and negative sentiment surrounding the firm. We test the above hypothesis for all the mentioned climate risks.

3.Data

3.1: Bond Short Selling Measure

We utilise the corporate bond lending data from Markit to obtain the firm level bond short interest. The primary purpose of borrowing a bond is to facilitate short selling (Asquith et. al. 2013). This dataset consists of total amount and value of bonds on loan. We also obtain the bond level issuance data from Fixed Income Securities Database (FISD). The key variable of interest in this study is the Bond Short Interest (BONDSS) which is the value-weighted bond short interest of all the bonds issued by a firm in a quarter. We follow Kalimipalli et. al. (2023) to compute this variable. We first calculate the average daily quantity of bonds on loan in a quarter and scale it by the bond offering amount of each bond. We multiply the quarterly bond short interest by the value weights. The value weights are the offering amount of the shorted bond divided by the sum of offering amounts of all the shorted bonds of the firm. Finally, we take the aggregate of quarterly value-weighted bond level short interest of all the shorted bond of a firm to arrive at the firm level bond short interest.

For robustness checks we also use the utilization ratio from the Markit database as an alternate proxy for bond short selling. The utilization ratio is the ratio between the amount of bond on loan scaled by the total lendable amount of bond (inventory).

For the FISD bond data, following exclusion filters are applied: bonds which are not listed or traded in the U.S. public market, are not issued by U.S. companies, are structured notes, mortgage-backed, asset-backed, agency-backed, or equity-linked, are convertible, trade under $5 or above $1000, have floating coupon rates, have less than one year to maturity.

3.2: Credit Default Swaps Spread

We obtain data on single name CDS Spreads(CDS) across tenors 1, 5, 10 and 30 years from IHS Markit. Following Bai and Wu, 2016, Ericsson, et al., 2009, Griffin, et al., 2016 we use the following filters on the CDS data. We retain only CDS denominated in US dollars; keep only senior unsecured obligations; keep only CDS contracts which have a modified restructuring (MR) documentation clause prior to April 2009; exclude CDS contracts which have a spread of more than 10,000 basis points; CDS entry that does not have an observation for CDS spread for any of the tenors is removed. Finally, the daily CDS spreads are averaged over each quarter to obtain the quarterly firm level CDS spreads.

3.3: Climate Risk Variables

We primarily use the climate risk scores from Sautner et. al., (2023) to assess the climate risks of a firm. This data employs a machine learning approach to identify the attention paid by financial analysts to firms' climate change exposures in earnings conference calls. Using this approach, they identify climate risks related to opportunity, regulatory and physical shocks. This data also has the negative sentiment scores associated with the firms for opportunity, regulatory and physical risks related to climate change. This is a quarterly measure available from 2002 to 2020 for more than 10000 firms. We use this measure as a proxy for climate risk exposure of a firm. We utilize this score to categorize the firms into high and low climate risk firms.

For robustness checks, we use alternate climate risk measure like the carbon emissions, physical and transition risk scores from Li et. al 2023 and Carbon Disclosure Project (CDP) Scores. We get the annual total, scope1, scope2 and scope3 carbon emissions from Refinitive. The Li et. al 2023

paper employs a textual analysis of earnings call transcripts to obtain physical and transition risk scores for firms. The CDP scores are a self assessment measure of climate risk of a firm. These scores are based on surveys filled by the firms and how they assess themselves when it comes to climate risk. In our robustness check, we consider firms who choose not to disclose their climate management (CDP score 9) as high-risk firms and others as low risk firms.

3.4: Control Variables:

We use several firm level and macroeconomic variables as control variables in our analysis. The firm level variables are obtained from Center for Research in Security Price (CRSP) and Compustat. We collect macroeconomic variables and market returns from the Federal Reserve Economic Data (FRED) and Kenneth French database respectively. We include theoretical determinants of credit spread from structural credit risk models by Merton 1974 in our model. We use SIZE, the natural logarithm of firm asset value in our analysis. We also include the idiosyncratic equity volatility (IVOL), which is measured as the standard deviation of daily excess returns over the preceding 180 days in our regressions. The firm leverage (LEVERAGE) defined as the total debts scaled by the total assets is also included as one of the control variables. Following Bharath and Shumway 2008 and Bai and Wu 2016, we also control for return on assets(ROA), cash and cash equivalent(CASH), turnover(TURNOVER), capital expenditure(CAPEX) and property and plant equipment(TANGIBILITY). The detail description of the variables is available in Appendix A.

We also control for the excess market return (MKT_RET), one year US Treasury rates (TSYIELD1) and government yield curve (TSSLOPE) as the macro economic variables which might impact the CDS Spreads as per Zhang et. al., (2009). The yield curve slope is the difference between ten- and two-year US treasury bond rates.

3.5: Sample Construction

We follow the filters described in the previous sections to clean the CDS and FISD data. We merge the Bond lending data, CDS data and the Sautner et. al. climate scores data. We merged these datasets using common firm identifiers like Cusip, GVKey, Ticker and Redcode. The sample period in this study is from January 2006 to December 2020 and the final sample consists of 16363 firm quarters and 375 unique firms. Further, we winsorize all continuous variables at the 1st and 99th percentile to mitigate the effect of either data errors or outliers.

3.5: Summary Statistics

Table 1 reports the summary statistics of all the main variables used in our analysis. The statistics are based on the 16393 firm-quarter observations. The mean and median of the quarterly CDS Spread are 131 bps and 79 bps respectively. The mean and median firm level bond short interest across all firms are 3.04% and 0.71% respectively which are similar to those in Hendershott, et al. (2020).

4. Empirical Analysis and Results

4.1 Bond Short Selling and CDS Spreads for high climate risk vs low climate risk firms

We analyze the relationship between Bond Short Selling and future CDS Spreads and how this relation changed post the Paris Accord in December 2015 for high climate risk firms. We estimate the following model specification to gauge the relationship between the 5-year CDS Spread of firm i in quarter t+1 (CDS $_{i,\ t+1}$) and Bond Short Selling ($BONDSS_{i,t}$) with reference to climate risk.

$$\ln(CDS_{i,\ t+1}) = \alpha + \beta_{bondss}\, BONDSS_{i,t} + \beta_{bondss*hld}\, BONDSS_{i,t} * HLD_{i,t} + \beta_{bondss*hld*post}\, BONDSS_{i,t} * HLD_{i,t} * Post_t + \beta_{bondss*post}\, BONDSS_{i,t} * Post_t + \beta_{hld*post} HLD_{i,t} * Post_t + \beta_{hld}\, HLD_{i,t} + \beta_{post}\, Post_t + \beta_X X_{i,t} + \beta_Y Y_t + \epsilon_{i,t+1} \quad (1)$$

To estimate the equation 1, we first define the high climate risk firms. Based on the Sautner climate scores, we divide the firms into quartiles. To account for industry specific factors, we form the firm quartiles within each industry. The quartiles are formed within each industry using the SIC Code and for every quarter. We define the firms which belong to the fourth quartile as high climate risk firms. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The low climate risk firms(high climate risk dummy=0) are defined in 2 ways- in the first regression we consider the firms in the first quartile as low climate risk and in the second regression we categorise the firms in first, second and third quartile as low climate risk firm. We consider 8 different climate risk categories to define high climate risk firms. The various climate risk categories are aggregate climate exposure score and climate exposure scores due to opportunity, regulatory and physical shocks, negative sentiment scores and the negative sentiment due to opportunity, regulatory and physical risks.

For our analysis we consider the Paris Accord event in December 2015(Q4-2015). The Paris Accord is considered an important event in the history of climate finance as it prompted discussions around the climate risks of firms. The variable $Post_t$ is 1 for quarters after the Paris Accord and 0 otherwise. For our analysis we consider 8 quarters before and after the event.

Following Bai & Wu, 2016; Bharath & Shumway, 2008 we use the natural logarithm of CDS Spread as the dependent variable. BONDSS is the short interest of the firm i in quarter t. $X_{i,t}$ is the firm level control variables and Y_t is the macroeconomic control variables. Further details of these variables are available in Appendix A.

To account for selection bias, we use Propensity Score Matching (PSM) in our analysis. We match 1 treatment sample (high climate risk firm) with 3 control samples(low climate risk firms). We control all panel regression models using firm, quarter and industry fixed effects and the standard errors are clustered at firm and quarter to account for cross sectional and serial correlation in error terms (Peterson 2009). The key coefficient of interest is $\beta_{\text{bondss*hld*post}}$ which depicts how the predictability of CDS Spreads by bond short sellers changes post the Paris Accord for high climate risk firms.

Table 2 reports the main regression results of model (1) effect of bond short sellers on future CDS Spreads with respect to high climate risk firms. We get positive and significant increase in the predictability of future CDS Spread by short sellers for high climate risk firms post Paris Accord. This result holds for most of the climate risk categories except for negative sentiment and climate

exposure pertaining to opportunity risks. This result implies that short sellers react to climate risk and has a positive effect on the relation between bond short selling and CDS Spread. This supports our hypothesis that short sellers incorporate climate risks in their assessment of corporate bonds.

The results are also economically significant. The expected change in the CDS Spread of high climate risk firms with respect to aggregate climate exposure, post the Paris Accord is 9.80% for each unit increase of bond short selling. Thus, one standard deviation increase in bond short selling (8.46%) will increase the CDS Spread by 82.91% equivalent to a 109bps increase in CDS Spreads in a quarter.

4.2 Robustness Checks

4.2.1 Alternate Measure of Bond Short Selling

We repeat our analysis of Model (1) with Utilization ratio as a proxy for bond short selling. Utilization ratio is the value of assets on loan divided by the total lendable assets, expressed as a percentage. Table 3 represents the regression results of (1) with utilisation ratio as the bond short selling measure. Our main results are robust to the change in our bond short selling measure.

4.2.2. Alternate Exogenous Events relevant to climate risks of firms

Trump election and US withdrawal from the Paris Accord

In our study, we examine the relation between bond short selling and CDS spread around the Paris Accord in December 2015 as it heightened awareness of the climate change risks faced by firms.

However, Donald Trump was against the Paris Accord and was supporting the withdrawal of US from this agreement. Hence, we investigate how the relation between bond short selling and future CDS spread have changed around the Trump election win in December 2016 and subsequent US withdrawal in June 2017.

Table 4 and Table 5 reports the results of estimating model (1) with Trump election and US withdrawal as the exogenous event. We observe the reversal of trend here as we negative and significant coefficient for $\beta_{\text{bondss*hld*post}}$. The relation between Bond short Selling and CDS spread have decreased post the Trump election and US withdrawal.

US State Climate Adaptation Plans

Several states in the United States have implemented their own state climate adaptation plan (SCAP) to deal with climate change risks. The SCAP are governmental interventions that can exert significant direct and indirect influences on corporate policies and actions with respect to climate change. A total of 18 states have implemented SCAP on staggered dates during our sample period. We use the stacked regression method by Baker et al. 2022 to test the effect of USSCAP implementation on the relation between bond short selling and CDS spread for high climate risk firms. The stacked regression approach is an event-by-event analysis which estimates separate treatment effects for each of the events and addresses staggered treatment timing and treatment effect heterogeneity. We create event-specific "clean 2×2" datasets, which include the outcome variable and controls for the treated cohort and other relevant variables. The datasets for each cohort are then "stacked" together, and we run our regression in model (1) on the stacked dataset.

Table 6 reports the results for the estimation of (1) with USSCAP as the exogenous event. The results particularly for regulatory risks are positive and significant which supports our main result.

4.2.3: Alternate Climate Risk Measures

CDP Scores

The CDP Scores depicts a firm's transparency on climate risk policies and environmental performance. The CDP scores are based on a survey filled in by firms to measure and manage their climate risks practices and actions. We estimate (1) again with the high climate risk firms as the ones who failed to respond to the CDP survey (score "F") indicating non-disclosure and the rest as low climate risk firms. Table 7 represent the result for this regression. The coefficient of interest $\beta_{\text{bondss*hld*post}}$ is negative and significant.

Physical and Transition Risk measure from Li et. al. 2024

Li et. al. 2024 employ a textual analysis on earnings conference transcripts to assign physical and transition risks scores to firms. The dataset has 5 scores for each firm that is physical-acute, physical-chronic, transition risk, transition-proactive and transition-nonproactive scores. We use these climate risk measures to define the high climate risk firms and run regression (1). Table 8 reports the results using the Li et. al. measure. We do not find significant results for the transition risk, but the coefficients are positive and significant for both the physical risk measures. This is in support of our main result.

4.2.4: Alternate CDS spreads

In our main analysis we use the 5-year CDS spread as a proxy for credit risks and find positive, significant results. To test the robustness to alternate measures of credit risk, we run our main regression (1) with 1-year, 10-year and 30- year CDS spreads. Table 9 reports the results for this analysis and our main results are robust to use of difference CDS spreads.

4.2.5 Addition of Lagged CDS Spreads as an independent variable

Our main dependent variable is the CDS spread, hence we also run our main regressions by adding the lagged CDS Spread to control for persistence in CDS spread. Table 10 reports the results of this analysis and our result is robust to addition of lagged CDS Spread as an explanatory variable.

4.2.6 Effect of alternate bond maturities

In this section we categorize the bonds into short (<5 years), medium(5-<10years) and long-term bond(>=10years) based on their time to maturity. We construct the bond short interest separately for each category of time to maturity of the bond and convert them to firm level as described in the data section. Table 11 reports the results for this analysis. We find that most of the significance of our main result stems from long term bonds. We find insignificant results for all short-term bond regressions.

4.2.7 Placebo Effect for Paris Agreement

To mitigate the possibility of finding significant results due to random chance, we perform a placebo test on the Paris Agreement event. We randomise the POST dummy variable and compare the result of this regression with the actual treatment effect. We thereby evaluate the null hypothesis that the observed treatment effect in our sample aligns with the distribution inferred through

numerical methods (MacKinnon & Webb, 2020; White & Webb, 2021). Table 12 shows the results of this analysis. As the p value is less than 0.05 for most of the measures, we can reject the null hypothesis that the sample realization of the treatment effect is consistent with the numerically inferred distribution.

5. Summary and Conclusions

In this paper we study the role of climate risk in the relationship between corporate bond short selling and subsequent CDS spreads. Our difference-in-differences (DiD) regressions show that sensitivity of subsequent CDS spreads to lagged bond short selling is significantly higher for firms with high regulatory and physical risks in the eight- quarters following the post-Paris Accord of 2015. Our results are robust to alternate (a) short-selling measure (i.e. utilization ratio), (b) exogeneous events involving Trump election 2016 and US withdrawal from the Paris Accord 2017, (c) CDS maturities, (d) climate risk proxies i.e., CDP scores and textual physical and transition risk measures (source: Li et. al., 2024, RFS), and (e) the staggered DiD regressions involving sequential implementation of US state climate adaptation plans. Further tests show that the relationship for bond short selling and subsequent CDS spreads mainly holds for long-term bond maturities. Overall, our findings inform that climate risk can significantly influence the relationship between bond short selling and subsequent CDS spreads.

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Appendix A

Short Selling Variables	Description	Data Source
Bond Short Interest	The value-weighted bond short interest of all the bonds issued by a firm in a quarter Short Interest= Average daily quantity of bonds on loan in a quarter/ offering amount of each bond Value weights = offering amount of the shorted bond/ Sum of offering amounts of all the shorted bonds of the firm Firm Level Bond Short Interest is the aggregate of quarterly value-weighted bond level short interest of all the shorted bond of a firm	IHS Markit & FISD
Utilisation	The value of assets on loan from beneficial owners (BO On Loan Value) divided by the total lendable assets (BO Inventory Value), expressed as a percentage	IHS Markit
Total Demand Quantity	Total quantity of borrowed/loaned securities net of double counting	IHS Markit
Total Demand Value	Total value of borrowed/loaned securities net of double counting	IHS Markit
Credit Risk Variable		
CDS5	The 5-year CDS Spread for firm at time t	IHS Markit
Carbon Risk Variables		
Climate Change Exposure	Firm-level climate change exposures from conversation in earnings conference calls. This is the relative frequency with which bigrams related to climate change occur in the transcripts of analyst conference calls. The score is the number of such bigrams divided by the total number of bigrams in the transcripts	Sautner et al.(2022)
Climate Change Exposure-Opportunity	Firm-level climate change exposures related to opportunity shock associated with climate change	Sautner et al.(2022)
Climate Change Exposure-Regulatory	Firm-level climate change exposures related to regulatory shock associated with climate change	Sautner et al.(2022)
Climate Change Exposure-Physical	Firm-level climate change exposures related to physical shock associated with climate change	Sautner et al.(2022)
Firm Level Variables		
Return on Assets(ROA)	Income after taxes scaled by average Total assets over the quarter	Compustat
Cash	Cash and Short-term Investments scaled by the Total Assets	Compustat
Turnover	Total Revenues scaled by the Total Assets	Compustat
Capex	Capital Expenditure scaled by the Total Assets	Compustat
Tangibility	Gross property, plant, and equipment less accumulated reserves for depreciation, depletion, and amortization scaled by the Total Assets	Compustat
Leverage	Total Debts scaled by the Total Assets	Compustat
Idiosynchratic Asset Volatility	Standard deviation of daily excess returns, computed as the difference between a firm's stock return and the CRSP valueweighted return over the past 180 days	CRSP
Size	The natural logarithms of the Total Assets	Compustat
Macro Financial Variables		
Yield1Yr(TSYIELD1)	One-year US Treasury rate	Federal Reserve Board
Yield Curve(TSSLOPE)	The difference in the yields of ten- and two-year Treasury bonds	Federal Reserve Board
MktRet	Monthly excess return of the market factor	K. French data library

Figure1: Bond Short Selling and CDS Spread for all firms

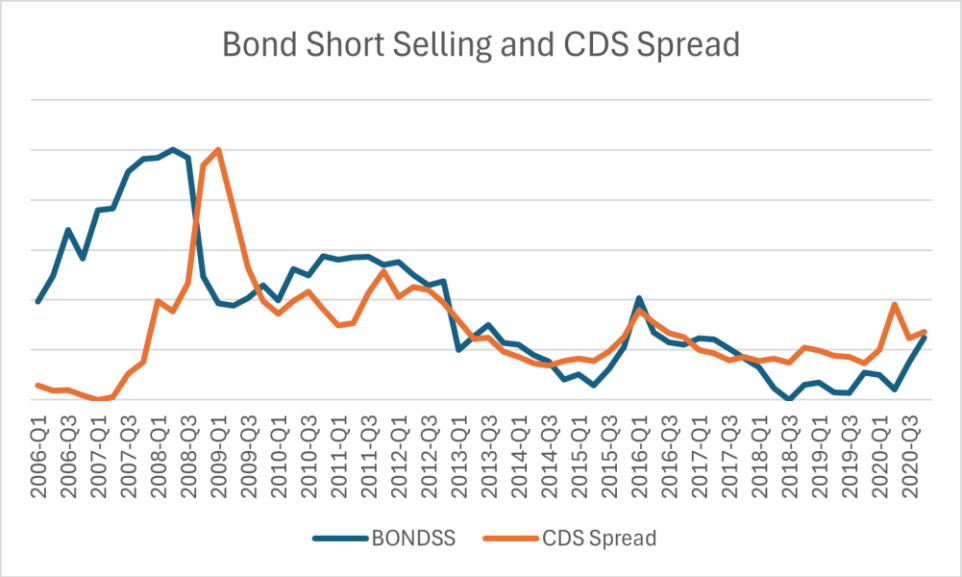

Figure 2: Bond Short Selling and CDS Spread for High Climate Risk firms

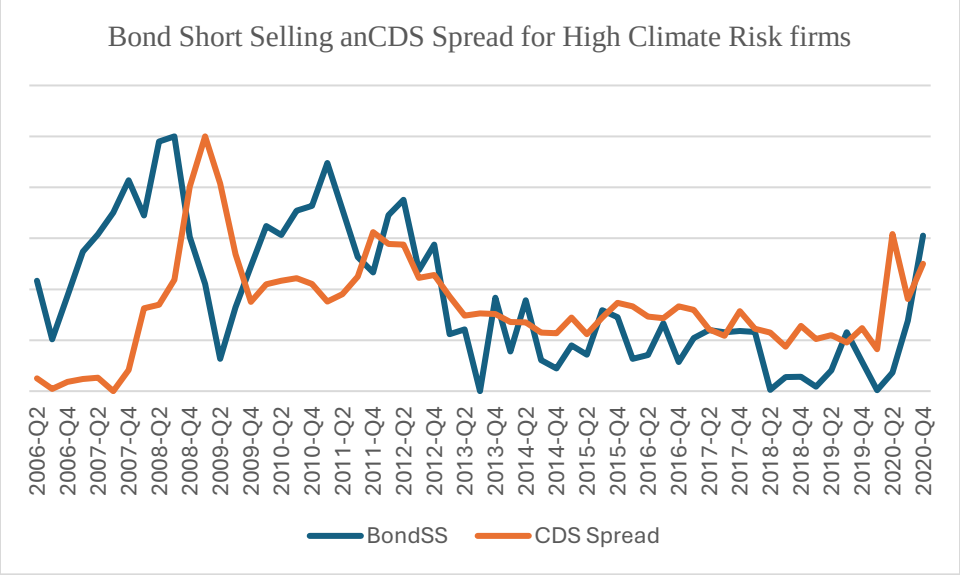

Figure 3: Bond Short Selling and CDS Spread for Low Climate Risk firms

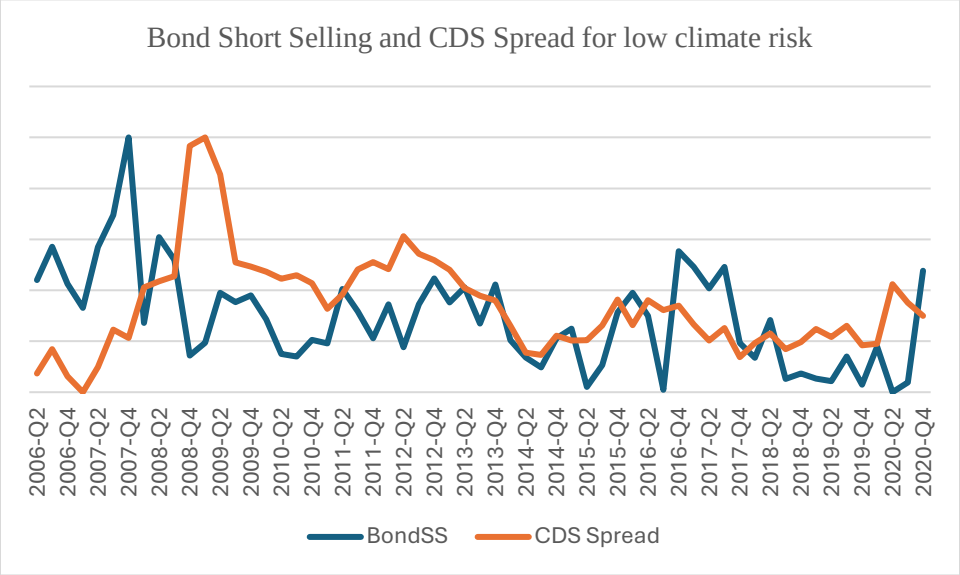

Figure 4: Bond Short Selling and CDS Spread for High Risk Firms(Portfolio formed within industry)

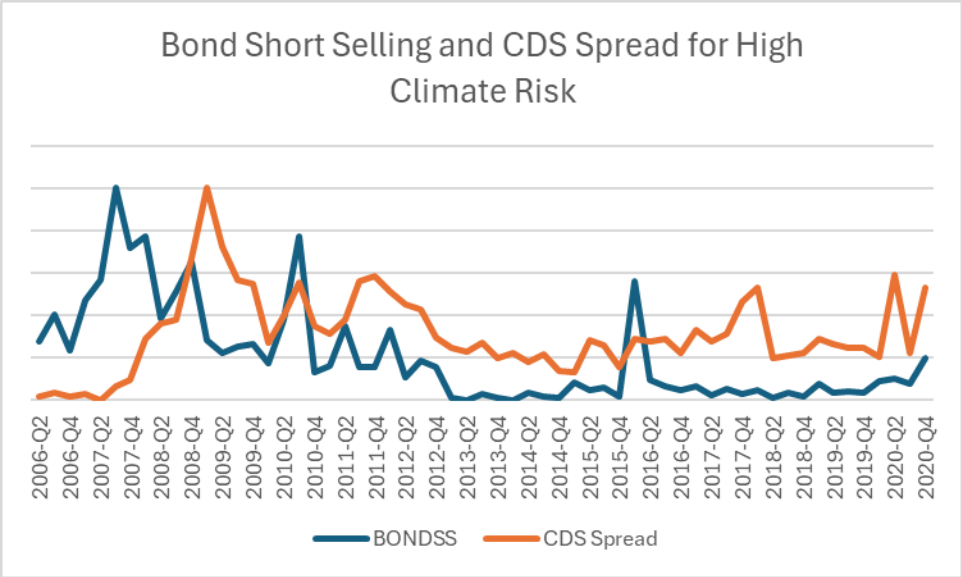

Figure 5: Bond Short Selling and CDS Spread for Low Risk Firms(Portfolio formed within industry)

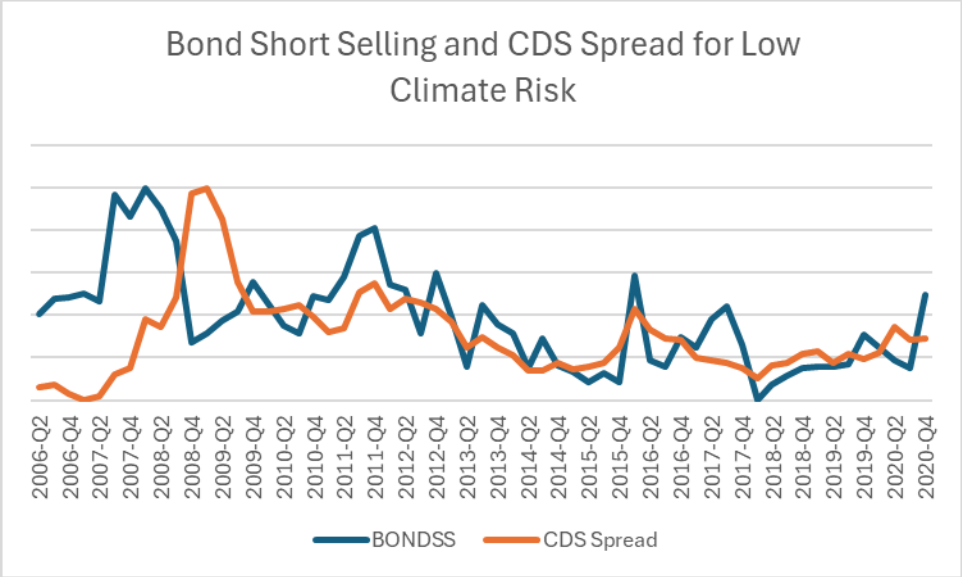

Figure 6:

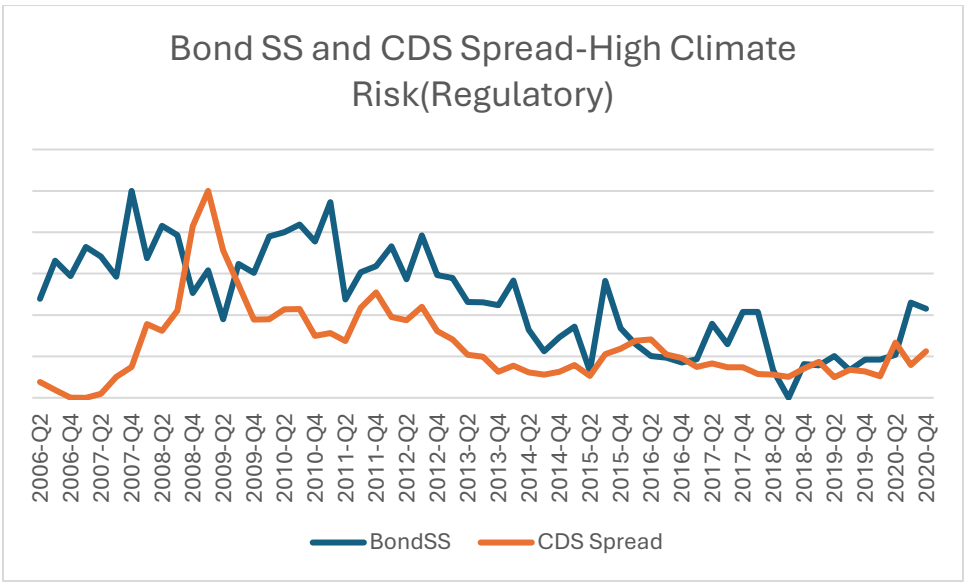

Figure 7:

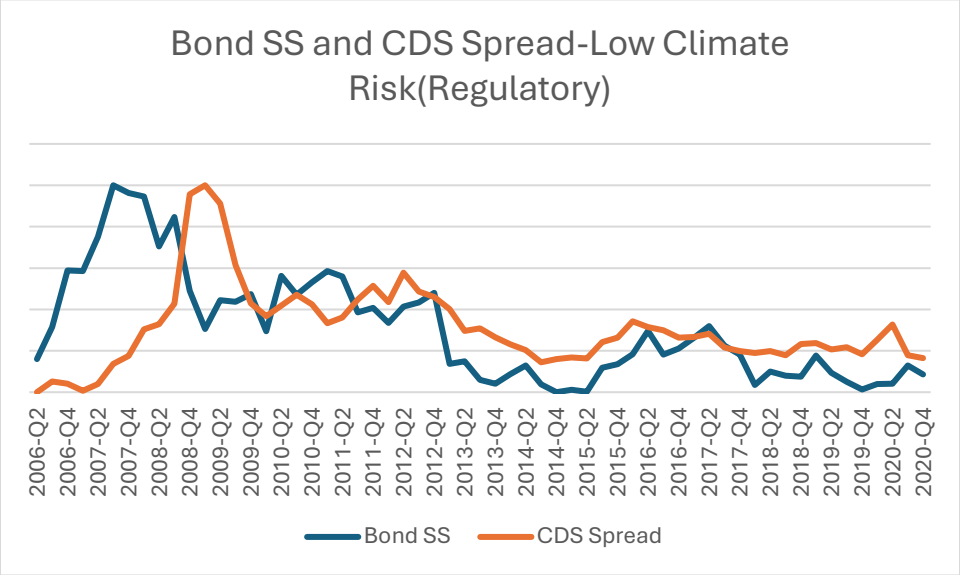

Figure 8:

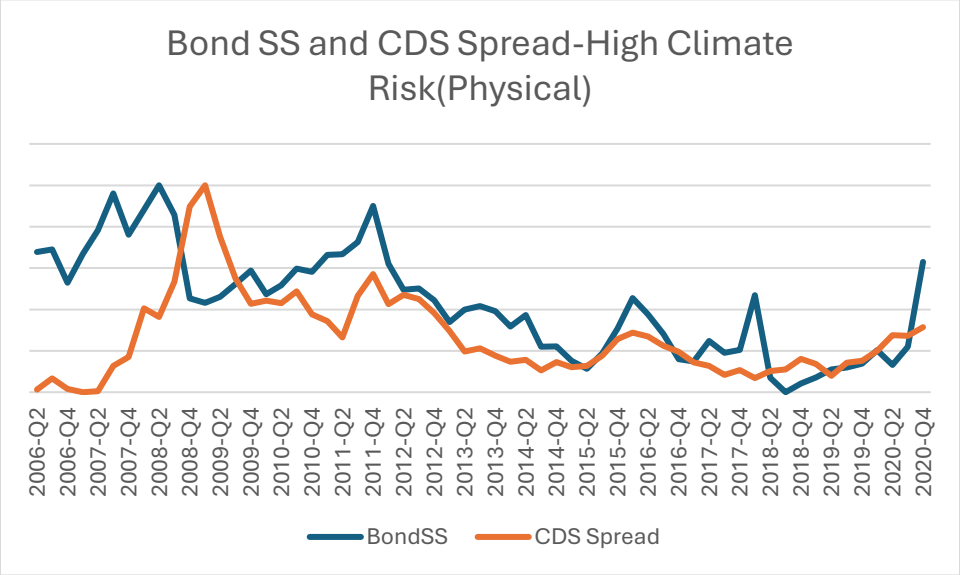

Figure 9:

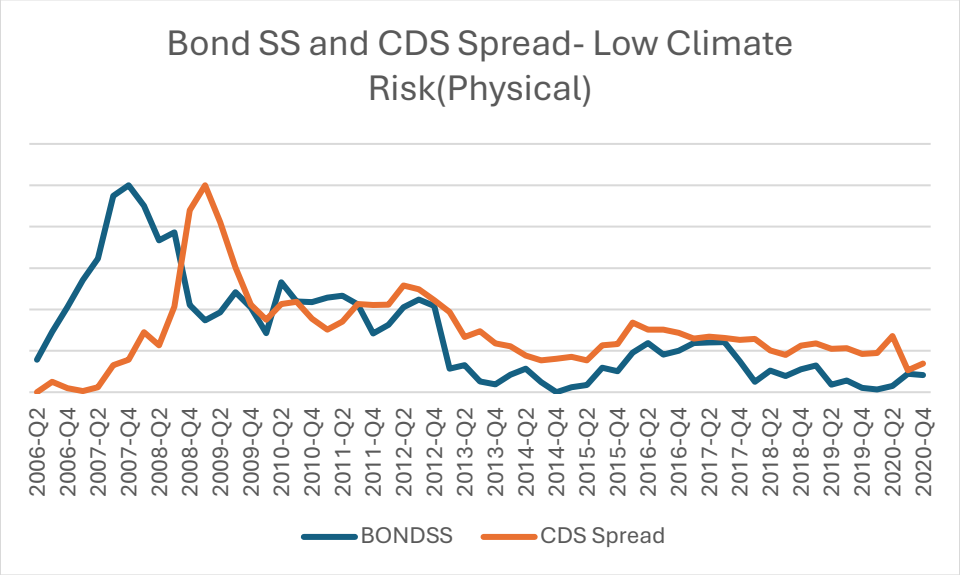
Bond SS and CDS Spread- Low Climate Risk(Physical)
2006-Q2
2006-Q4
2007-Q2
2007-Q4
2008-Q2
2008-Q4
2009-Q2
2009-Q4
2010-Q2
2010-Q4
2011-Q2
2011-Q4
2012-Q2
2012-Q4
2013-Q2
2013-Q4
2014-Q2
2014-Q4
2015-Q2
2015-Q4
2016-Q2
2016-Q4
2017-Q2
2017-Q4
2018-Q2
2018-Q4
2019-Q2
2019-Q4
2020-Q2
2020-Q4
BONDSS
CDS Spread

Table 1: Summary Statistics

The table provides the summary statistics of the key variables for a sample of 375 firms in the US from Feb-2006 to Dec-2020. The CDS spread CDS5 is reported in real values and expressed in basis points(bps). BONDSS is the value-weighted (offering amount of the shorted bond/ sum of offering amounts of all the shorted bonds of the firm) bond short interest(average daily quantity of bonds on loan in a quarter/ offering amount of each bond of all the bonds issued by a firm). SIZE is the natural logarithms of the total assets of the firm. LEVERAGE is the total debts of the firm scaled by total assets. TANGIBILITY is the gross property, plant, and equipment less accumulated reserves for depreciation, depletion, and amortization scaled by the total assets.CASH is the cash and short-term Investments scaled by the total assets. ROA is the income after taxes scaled by average total assets over the quarter. CAPEX capital expenditure scaled by total assets. TURNOVER is the total revenue scaled by total assets of the firm. IVOL is the standard deviation of daily excess returns, computed as the difference between a firm's stock return and the CRSP valueweighted return over the past 180 days. MKT_RET is the monthly excess return of the market factor. TSYIELD1 is the one-year US treasury rate and TSSLOPE is the yield curve that is the the difference in the yields of ten- and two-year Treasury bonds. The details of these variables are in appendix 1. All continuous variables are winsorized at 1st and 99th percentile.

	N	Mean	SD	p25	Median	p75	Max
			5–Year CDS Spread at the End of Month				
CDS5 (bps)	16363	131.49	160.11	43.95	79.16	144.17	988.49
			Firm Level Bond Short Interest Measure				
BONDSS (%)	16363	3.04	8.46	0.29	0.71	1.93	62.85
			Firm Characteristic Variables				
SIZE	14718	9.99	1.38	8.99	9.80	10.72	14.28
LEVERAGE	14718	0.30	0.16	0.19	0.29	0.40	0.77
TANGIBILITY	14718	0.52	0.48	0.07	0.40	0.90	2.11
CASH	14718	0.16	0.15	0.05	0.12	0.23	0.71
ROA	14718	0.01	0.02	0.00	0.01	0.02	0.06
CAPEX	14718	0.03	0.03	0.01	0.02	0.04	0.16
TURNOVER	14718	0.21	0.19	0.08	0.16	0.27	0.97
IVOL	16172	0.02	0.01	0.01	0.01	0.02	0.07
			Macro–Financial Variables				
MKT_RET (%)	16363	0.74	2.90	-0.14	1.32	2.14	7.23
TSYIELD1 (%)	16363	1.41	1.61	0.21	0.59	2.08	5.05
TSSLOPE (%)	16363	1.46	1.00	0.46	1.48	2.47	3.13

Table 2: The Relation between Bond Short Interest and 5–Year CDS Spread for high climate risk vs low climate risk firms

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. the difference columns correspond to different type of climate risks as described in appendix A1. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartiles-1,2,3. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

Panel A

	Climate Exposure-Aggregate		Climate Exposure-Opportunity		Climate Exposure-Regulatory		Climate Exposure-Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.11***	0.004	0.033	0.01	0.0712***	0.064***	0.135***	0.062***
	(3.56)	(0.41)	(1.26)	(0.92)	(3.32)	(3.03)	-4.05	-3.17
BONDDSS x High Climate Risk Dummy	-0.12***	–0.01	0.0124	0	0.088***	-0.074***	-0.15***	-0.065***
	(-2.57)	(–0.71)	-0.22	-0.016	(-3.57)	(-3.10)	(-4.27)	(-2.94)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.094**	0.00	-0.22	-0.011	0.067***	0.047**	0.113***	0.041*
	(2.33)	(0.024)	(-0.46)	(-0.68)	(2.77)	(2.09)	(3.70)	(1.93)
BONDSS x Post Paris Accord Dummy	-0.10	-0.01	-0.028	-0.012	-0.063***	-0.049**	-0.109***	-0.047**
	(-0.33)	(-0.87)	(-1.09)	(-1.20)	(-2.92)	(-2.47)	(-3.82)	(-2.47)
High Climate Risk Dummy	0.034	-0.01	-0.068	-0.057	-0.012	-0.047	-0.004	0.002
	-0.65	(-0.20)	(-1.06)	(-1.48)	(-0.16)	(-1.07)	(-0.023)	-0.031
High Climate Risk Dummy x Post Paris Accord Dummy	-0.042	–0.05	0.087	-0.015	0.009	0.013	-0.017	-0.021
	(-0.65)	(–0.94)	-1.28	-0.29	-0.14	-0.23	(-0.28)	(-0.40)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	396	396	408	408	412	412
Adj.R^2	-0.02	0.17	0.06	0.14	-0.03	0.28	-0.02	0.05

Panel B

	Negative Sentiment		Negative Sentiment - Opportunity		Negative Sentiment - Regulatory		Negative Sentiment -Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.017***	0.013	0.025***	0.073***	0.12***	0.093***	0.118***	0.071***
	-2.95	-1.22	-2.95	-3.8	-3.53	(-4.30)	-3.46	-3.4
BONDDSS x High Climate Risk Dummy	-0.005	0.006	-0.023	-0.081***	-0.142***	-0.101***	-0.136***	-0.083***
	(-0.154)	-0.2	(-1.62)	(-3.73)	(-3.93)	(-4.19)	(-3.85)	(-3.55)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	-0.0198	-0.015	0.005	0.068***	0.107***	0.064***	0.108***	0.052**
	(-0.58)	(-0.54)	-0.34	-3.13	-3.45	-2.84	-3.59	-2.38
BONDSS x Post Paris Accord Dummy	0.002	-0.011	-0.015*	-0.071***	-0.099***	-0.066***	-0.102***	-0.051***
	-0.52	(-1.13)	-2.08)	(-3.70)	(-3.40)	(-3.26)	(-3.59)	(-2.62)
High Climate Risk Dummy	0.092	0.128***	0.051	0.071	0.12	0.04		-0.17*
	-1.52	-2.68	-0.84	-1.66	-1.05	-0.66		(-1.92)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.013	-0.127**	0.012	-0.048	-0.0396	-0.015	-0.03	0.01
	(-0.19)	(-2.17)	-0.182	(-0.91)	(-0.64)	(-0.26)	(-0.51)	-0.18
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	420	420	420	420	424	424	424	424
Adj.R^2	-0.13	0.11	-0.07	0.17	-0.04	0.24	-0.01	0.23

Table 3: Robustness checks with alternate bond short selling measure, Utilisation

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the average utilisation (The value of assets on loan/total lendable assets) of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Climate Exposure-Aggregate		Climate Exposure-Opportunity		Climate Exposure-Regulatory		Climate Exposure-Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.24***	0.012	0.078	0.026	0.13***	0.072*	0.266***	0.079**
	(3.65)	(0.50)	(1.36)	(1.09)	(2.83)	(1.75)	(3.43)	(2.11)
BONDDSS x High Climate Risk Dummy	-0.27***	-0.032	0.008	-0.011	-0.16***	-0.089*	-0.296***	-0.077*
	(-2.62)	(-0.82)	(0.069)	(-0.27)	(3.00)	(-1.82)	(-3.55)	(-1.72)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.22**	0.012	-0.033	-0.01	0.11**	0.041	0.27***	0.027
	(2.32)	(0.30)	(-0.312)	(-0.24)	(1.99)	(0.84)	(3.30)	(0.61)
BONDSS x Post Paris Accord Dummy	-0.22***	-0.019	-0.066	-0.029	-0.096**	-0.042	-0.26***	-0.044
	(-3.34)	(0.83)	(-1.17)	(-1.27)	(-1.99)	(-1.01)	(-3.38)	(-1.15)
High Climate Risk Dummy	0.039	-0.005	-0.055	-0.052	-0.033	-0.065	-0.025	-0.019
	(0.74)	(-0.131)	(-0.85)	(-0.33)	(-0.45)	(-1.48)	(-0.16)	(-0.33)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.039	-0.053	0.078	-0.021	0.025	0.026	-0.024	-0.002
	(-0.60)	(-1.00)	(1.17)	(-0.40)	(0.41)	(0.47)	(-0.40)	(-0.046)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	396	396	408	408	412	412
Adj.R^2	-0.02	0.17	0.06	0.14	-0.047	0.26	-0.042	0.14

Table 4: Robustness check with alternate event- Trump Election

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post Trump Election Dummy is 1 for quarters post Q4-2016 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA; CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Climate Exposure-Aggregate		Climate Exposure-Opportunity		Climate Exposure-Regulatory		Climate Exposure-Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.009***	0.007***	0.01***	0.007***	0.010***	0.007***	0.01***	0.008***
	(4.66)	(5.03)	(5.95)	(4.99)	(5.94)	(4.87)	(5.99)	(5.58)
BONDDSS x High Climate Risk Dummy	-0.019***	-0.009**	-0.018**	-0.008*	-0.013***	-0.004	-0.014***	-0.012***
	(-2.60)	(-2.17)	(-2.56)	(-1.86)	(-2.90)	(-1.00)	(-3.42)	(-3.03)
BONDSS x High Climate Risk Dummy x Post Trump Election Dummy	-0.097***	-0.093***	-0.107***	-0.112***	-0.047***	-0.048***	-0.030**	-0.037***
	(-2.80)	(-2.74)	(-2.93)	(-3.34)	(-2.97)	(-3.07)	(-2.15)	(-2.59)
BONDSS x Post Trump Election Dummy	0.001	-0.002	-0.002	-0.0016	-0.009***	-0.0015	-0.008***	-0.002
	(0.43)	(-1.17)	(-0.91)	(-1.05)	(-3.84)	(-0.99)	(-3.31)	(-1.36)
High Climate Risk Dummy	-0.094**	-0.068*	-0.128***	-0.102***	-0.144**	-0.105**	0.088	0.027
	(-2.13)	(-1.86)	(-2.59)	(-2.89)	(-2.34)	(-2.53)	(0.90)	(0.53)
High Climate Risk Dummy x PostTrump Election Dummy	0.15***	0.138	0.269***	0.24***	0.175***	0.154***	0.06	0.064
	(2.80)	(2.71)	(5.06)	(4.75)	(3.68)	(3.29)	(1.33)	(1.43)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	396	396	408	408	412	412
Adj.R^2	0.05	0.07	0.08	0.08	0.07	0.08	0.06	0.07

Table 5: Robustness checks with alternate event- US Withdrawal

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post US withdrawal Dummy is 1 for quarters post Q2-2017 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA; CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Climate Exposure-Aggregate		Climate Exposure-Opportunity		Climate Exposure-Regulatory		Climate Exposure-Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.062***	-0.002	0.061***	-0.002	0.052***	-0.002	0.058***	0.087***
	(3.05)	(-0.77)	(3.67)	(-0.59)	(2.92)	(-0.45)	(3.35)	(5.19)
BONDDSS x High Climate Risk Dummy	-0.069***	-0.009*	-0.066***	-0.007	-0.057***	-0.002	-0.059***	-0.092***
	(-3.33)	(-1.74)	(-3.96)	(-1.35)	(-3.26)	(-0.29)	(-3.48)	(-5.29)
BONDSS x High Climate Risk Dummy x Post US withdrawal Dummy	-0.021	-0.042	-0.003	-0.095*	-0.23**	-0.25***	-0.44***	-0.16**
	(-0.32)	(-0.91)	(-0.057)	(-1.92)	(-2.32)	(-3.21)	(-3.95)	(-2.03)
BONDSS x Post US withdrawal Dummy	-0.053***	-0.027**	-0.049***	-0.002	-0.0598***	0.008	-0.046**	-0.087***
	(-2.62)	(-2.36)	(-3.05)	(-0.17)	(-3.49)	(0.72)	(-2.39)	(-5.26)
High Climate Risk Dummy	-0.025	-0.051	-0.04	-0.069	-0.095	-0.14**	0.15	0.071
	(-0.43)	(-1.09)	(-0.58	(-1.41)	(-1.01)	(-2.37)	(1.27)	(1.06)
High Climate Risk Dummy x Post US withdrawal Dummy	0.042	0.035	0.132	0.13*	0.27***	0.38***	0.32***	0.099
	(0.46)	(0.45)	(1.45	(1.70)	(2.83)	(4.95)	(3.54)	(1.03)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	364	364	360	360	372	372	376	376
Adj.R^2	-0.2	0.086	0.053	0.016	0.03	0.19	-0.01	0.19

Table 6: Robustness checks with alternate event- US State Climate Adaptation Plans

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post USSCAP Dummy is 1 for quarters post the quarter in which the state where the firm is headquartered implement State Climate Adaptation Plans and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. The We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Climate Exposure-Aggregate		Climate Exposure-Opportunity		Climate Exposure-Regulatory		Climate Exposure-Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.014***	0.005	0.018***	-0.002	0.017***	0.012***	0.015***	0.013***
	(4.21)	(1.60)	(4.29)	(-0.38)	(5.23)	(3.47)	(5.26)	(3.74)
BONDDSS x High Climate Risk Dummy	-0.011*	-0.002	-0.022***	-0.003	-0.027***	-0.018***	-0.026***	-0.018***
	(-2.31)	(-0.38)	(-3.16)	(-0.66)	(-4.89)	(-3.51)	(-5.49)	(-4.29)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.003	-0.001	0.021*	0.003	0.024***	0.015*	-0.054	0.014*
	(0.35)	(-0.19)	(1.84)	(0.34)	(2.53)	(1.71)	(-1.34)	(1.66)
BONDSS x Post Paris Accord Dummy	-0.008	-0.003	-0.015*	0.002	0.002	0.003	0.056	-0.003
	(-1.26)	(-0.57)	(-1.70)	(0.30)	(0.34)	(0.72)	(1.42)	(-0.65)
High Climate Risk Dummy	0.003	0.047	0.11*	0.03	-0.015	0.015	-0.17***	-0.03
	(1.41)	(1.32)	(1.93)	(0.78)	(-0.25)	(0.37)	(-2.15)	(-0.66)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.02	-0.09	0.10	0.023	0.32	0.18*	0.30***	0.12
	(-0.19)	(-1.01)	(1.00)	(0.26)	(2.92)	(1.80)	(2.45)	(1.10)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1316	1316	1272	1272	1352	1384	1404	1448
Adj.R^2	0.06	0.09	0.06	0.02	0.15	0.19	0.15	0.04

Table 7: Robustness checks with alternate measure of climate risk-CDP Scores

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms with CDP score 9, which indicates non disclosures of climate change policy, are high climate risk firms. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. The We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	CDS5
	(1)
BONDSS	0.01***
	(2.59)
BONDDSS x High Climate Risk Dummy	0.36***
	(4.52)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	-0.38***
	(-4.72)
BONDSS x Post Paris Accord Dummy	-0.00
	(-0.32)
High Climate Risk Dummy	-0.21***
	(-2.69)
High Climate Risk Dummy x Post Paris Accord Dummy	0.43***
	(4.36)
Firm Variables	Yes
Macroeconomic Variables	Yes
Firm FE	Yes
Industry FE	Yes
Time FE	1821
N	1821
Adj.R^2	0.05

Table 8: Robustness checks with alternate climate risk measure from Li et. al.(2020)

The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Li et. al 2020. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 ,9the low climate risk firms are the firms in the first quartile and in column 2,4,6,8,10 the low climate risk firms include rest of the quartiles. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Physical-Acute		Physical-Chronic		Transition		Transition-Proactive		Transition-Non Proactive	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
BONDSS	0.032	0.053***	-0.002	0.073***	0.022	0.045**	0.066**	0.029**	0.024*	0.03
	(1.58)	(3.02)	(-0.61)	(3.21)	(1.39)	(2.34)	(2.25)	(2.38)	(1.83)	(1.56)
BONDDSS x High Climate Risk Dummy	-0.05	-0.06***	0.012***	-0.075***	0.064	0.024	-0.06**	-0.035*	0.09	0.032
	(3.49)	(-2.91)	(3.32)	(-2.98)	(0.60)	(0.40)	(-2.01)	(-1.74)	(0.89)	(0.54)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.03**	0.045**	0.002	0.056**	-0.08	-0.04	0.04	0.016	-0.12	-0.013
	(2.22)	(2.18)	(0.25	(2.29)	(-0.47)	(-0.31)	(1.55)	(0.78)	(-0.67)	(-0.11)
BONDSS x Post Paris Accord Dummy	0.035***	-0.046***	-0.0104	-0.06***	-0.02	-0.037**	-0.06**	-0.017	-0.024*	-0.026
	(-2.60)	(-2.65)	(-1.03)	(-2.91)	(-1.48)	(-2.06)	(-2.22)	(-1.30)	(-1.80)	(-1.45)
High Climate Risk Dummy	-0.097**	0.042	-0.085	0.036	0.02	0.016	0.03	-0.01	-0.00	-0.01
	(-2.12)	(0.84)	(-1.55)	(0.79)	(0.26)	(0.33)	(0.43)	(-0.22)	(-0.00)	(-0.12)
High Climate Risk Dummy x Post Paris Accord Dummy	0.002	-0.019	0.002	-0.044	0.087	0.03	0.08	0.047	0.097	0.032
	(0.05)	(-0.31)	(0.39)	(-0.76)	(0.87)	(0.38)	(1.00)	(0.67)	(0.98)	(0.42)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	364	364	364	364	364	364	364	364	364	364
Adj.R^2	0.06	0.16	0.054	0.23	0.13	0.013	-0.03	0.06	0.1	0.01

Table 9: Robustness checks with alternate CDS Spreads

This table presents the results from the panel regression of the one quarter ahead 1,5,10,30 year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. The low climate risk firms are the firms in the first quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

Panel A

	Climate Exposure-Aggregate				Climate Exposure-Opportunity			
	CDS1	CDS5	CDS10	CDS30	CDS1	CDS5	CDS10	CDS30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.10**	0.11***	0.081***	0.074***	0.043	0.033	0.014	0.006
	(2.28)	(3.56)	(3.49)	(3.29)	(1.16)	(1.26)	(0.72)	(0.31)
BONDDSS x High Climate Risk Dummy	-0.13*	-0.118**	-0.077**	-0.076**	0.039	0.0124	0.029	0.052
	(1.92)	(-2.57)	(-2.23)	(-2.28)	(0.48)	(0.22)	(0.66)	(1.27)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.10*	0.094**	0.062**	0.064**	-0.040	-0.22	-0.033	-0.049
	(1.73)	(2.33)	(2.06)	(2.18)	(-0.59)	(-0.46)	(-0.89)	(-1.41)
BONDSS x Post Paris Accord Dummy	-0.099**	-0.10	-0.076***	-0.072***	-0.043	-0.028	-0.012	-0.007
	(-2.25)	(03.33)	(-3.34)	(-3.26)	(-1.19)	(-1.09)	(-0.63)	(-0.38)
High Climate Risk Dummy	0.029	0.034	0.036	0.021	-0.09	-0.068	-0.36	-0.027
	(0.38)	(0.65)	(0.93)	(0.55)	(-0.99)	(-1.06)	(-0.91)	(-0.60)
High Climate Risk Dummy x Post Paris Accord Dummy	0.062	-0.042	-0.041	-0.056	0.12	0.087	0.042	0.004
	(0.65)	(-0.65)	(-0.83)	(-1.14)	(1.27)	(1.28)	(0.79)	(0.089)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	384	384	396	396	396	396
Adj.R^2	-0.11	-0.018	0.007	-0.02	-0.023	0.062	0.065	0.13

Panel B

	Climate Exposure-Regulatory				Climate Exposure-Physical			
	CDS1	CDS5	CDS10	CDS30	CDS1	CDS5	CDS10	CDS30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.11***	0.0712***	0.053***	0.059***	0.24***	0.135***	0.092***	0.089***
	(3.82)	(3.32)	(3.15)	(3.81)	(5.17)	(4.05)	(3.48)	(3.61)
BONDDSS x High Climate Risk Dummy	-0.16***	0.088***	-0.066***	-0.071***	-0.29***	-0.15***	-0.10***	-0.10***
	(-4.28)	(-3.57)	(-3.41)	(-4.01)	(-5.71)	(-4.27)	(-3.73)	(-3.84)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.136***	0.067***	0.047**	0.055***	0.23***	0.113***	0.076***	0.077***
	(3.64)	(2.77)	(2.52)	(3.15)	(5.17)	(3.70)	(3.17)	(3.41)
BONDSS x Post Paris Accord Dummy	-0.10***	-0.063***	-0.045**	-0.052***	-0.19***	-0.109***	-0.074***	-0.075
	(-3.54)	(-2.92)	(-2.68)	(-3.41)	(-4.24)	(-3.82)	(-3.29)	(-3.60)
High Climate Risk Dummy	0.24***	-0.012	-0.013	0.015	0.075	-0.004	-0.016	-0.028
	(2.38)	(-0.16)	(0.23)	(0.28)	(0.35	(-0.023)	(-0.13)	(-0.24)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.051	0.009	0.002	-0.027	-0.17**	-0.017	-0.033	-0.018
	(-0.59)	(0.14)	(0.042)	(-0.60)	(-2.17)	(-0.28)	(-0.73)	(-0.42)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	408	408	408	408	412	412	412	412
Adj.R^2	0.001	-0.0285	-0.036	-0.01	-0.01	-0.015	-0.02	-0.04

Table 10: The Relation between Bond Short Interest and 5–Year CDS Spread for high climate risk vs low climate risk firms including lagged CDS spread as a control variable

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (*CDS5*) for firm *i* at the end of month *t*. *BONDSS* is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm *i* in month *t–1*. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile and the low climate risk firms are the firms in the first quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (*SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX*) as the control variables, and b) macro–financial variables (*TSYIELD1, TSSLOPE and MKTRET*) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the *t–statistics* of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Climate Exposure-Aggregate	Climate Exposure-Opportunity	Climate Exposure-Regulatory	Climate Exposure-Physical	Negative Sentiment	Negative Sentiment - Opportunity	Negative Sentiment - Regulatory	Negative Sentiment -Physical
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
BONDSS	0.037*	0.012	0.02*	0.02	0.004	0.004	0.024**	0.018
	(1.77)	(0.97)	(1.88)	(1.73)	(0.44)	(0.61)	(2.23)	(1.38)
BONDDSS x High Climate Risk Dummy	-0.069**	-0.007	-0.019	-0.018	-0.03	-0.035**	-0.023*	-0.021
	(-2.11)	(-0.19)	(-1.42)	(-1.18)	(-1.61)	(-2.40)	(-1.73)	(-1.35)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.059**	0.007	0.022*	0.038***	0.028*	0.034**	0.035***	0.048***
	(2.03)	(0.22)	(1.72)	(2.47)	(1.89)	(2.53)	(2.56)	(3.13)
BONDSS x Post Paris Accord Dummy	-0.038	-0.02	-0.028***	-0.04***	-0.008	-0.008	-0.04***	-0.051***
	(-0.06)	(-1.57)	(-2.63)	(-3.31)	(-1.21)	(-1.36)	(-3.46)	(-3.81)
High Climate Risk Dummy	0.022	-0.027	-0.04	-0.05	-0.03	-0.034	0.02	-0.07
	(0.57)	(-0.61)	(-0.93)	(-0.47)	(-0.71)	(-0.84)	(0.42)	(-0.47)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.016	0.038	0.34	0.005	0.002	0.006	0.02	0.00
	(-0.32)	(0.82)	(0.039)	(0.12)	(0.04)	(0.12)	(0.50)	(0.001)
Lagged CDS5	0.78***	0.66***	0.73***	0.76***	0.76***	0.75***	0.74***	0.75***
	(17.07)	(15.36)	(18.35)	(17.60)	(19.15)	(18.12)	(19.38)	(17.59)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	428	424	424	428	428	424	424	424
Adj.R^2	0.42	0.50	0.52	0.49	0.54	0.54	0.53	0.51

Table 11: Relation between Bond Short Selling and future CDS Spread for different bond tenors

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. The low climate risk firms are the firms in the first quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We divide the bonds into short term (<5 years), medium term(5-<10 years) and long term(>=10years) based on the time to maturity. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Climate Exposure-Aggregate			Climate Exposure-Opportunity			Climate Exposure-Regulatory			Climate Exposure-Physical		
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
BONDSS	0.021	0.052**	0.11***	0.009	0.013	0.033	0.001	0.011	0.0712***	0.006	0.071***	0.135***
	(1.53)	(2.43)	(3.56)	(0.94)	(0.66)	(1.26)	(0.079)	(1.09)	(3.32)	(0.90)	(2.99)	(4.05)
BONDDSS x High Climate Risk Dummy	-0.097	-0.048	-0.118**	0.017	0.02	0.0124	0.05	-0.024**	0.088***	-0.00	-0.084***	-0.15***
	(-1.55)	(-1.24)	(-2.57)	(1.43)	(0.42)	(0.22)	(1.49)	(-2.01)	(-3.57)	(-0.014)	(-3.28)	(-4.27)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.11	0.032	0.094**	0.038	-0.02	-0.22	-0.055	0.027**	0.067***	-0.027	0.067***	0.113***
	(1.64)	(0.98)	(2.33)	(1.16)	(-0.51)	(-0.46)	(-0.51	(2.01)	(2.77)	(-0.43)	(2.87)	(3.70)
BONDSS x Post Paris Accord Dummy	-0.009	-0.044**	-0.10	-0.02**	-0.017	-0.028	-0.007	-0.025**	-0.063***	-0.010	-0.066***	-0.109***
	(-0.46)	(-2.20)	(03.33)	(-2.08)	(-0.89)	(-1.09)	(-0.61)	(-2.19)	(-2.92)	(-1.22)	(-3.00)	(-3.82)
High Climate Risk Dummy	0.12	0.008	0.034	-0.16	-0.89	-0.068	-0.03	-0.073	-0.012		-0.033	-0.004
	(0.72)	(0.14)	(0.65)	(-1.52)	(-1.21)	(-1.06)	(-0.18)	(-0.94)	(-0.16)		(-0.14)	(-0.023)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.21	-0.007	-0.042	-0.14	0.11	0.087	0.12	0.028	0.009	0.94	-0.01	-0.017
	(-1.07)	(-0.10)	(-0.65)	(-1.09)	(1.49)	(1.28)	(0.75)	(0.44)	(0.14)	(1.10)	(-0.17)	(-0.28)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	384	396	396	396	408	408	408	412	412	412
Adj.R^2	-0.23	-0.062	-0.018	0.1	0.065	0.062	-0.33	-0.015	-0.0285	-0.13	-0.03	-0.015

Table 12: Placebo Test for Paris Agreement Event

This table presents the results of the placebo test using randomization inference method to ascertain the impact of the Paris Agreement of December 2015. In our main analysis, 'POST' takes value of one for the period after December 2015 and zero otherwise and 'HLD' takes the value of one if a firm's climate risk is in the top quartile and 0 if it is in the bottom most quartile. The test in this table re-samples or permutes the Paris Agreement dummy variable 'POST' leading to re-estimation of the statistic of main difference-in-difference interaction variable 'HLD × POST'. 'T(obs)' is the realization of the test statistic in the data; 'c' is the count of under how many of the re-sampled iterations, the realization of the test-statistic was more extreme than 'T(obs)'; 'n' is the total count of re-samplings; 'p=c/n' is the actual randomized inference based p-value; 'SE(p)' is the standard-error of the p-value estimate; '95% Conf. Interval' is an estimated confidence interval for the p-value.

	T(obs)	c	n	p=c/n	SE(p)	[95% confidence interval]	
Climate Exposure-Aggregate	-0.006	15	500	0.03	0.008	0.015	0.045
Climate Exposure-Opportunity	-0.006	24	500	0.048	0.009	0.029	0.067
Climate Exposure-Regulatory	-0.007	8	500	0.016	0.006	0.005	0.027
Climate Exposure-Physical	-0.006	26	500	0.052	0.01	0.033	0.071

IA1: Robustness check with alternate measure of bond short selling, Utilisation for Negative Sentiment measure of climate risk

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the average utilisation (The value of assets on loan/total lendable assets) of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Negative Sentiment		Negative Sentiment - Opportunity		Negative Sentiment - Regulatory		Negative Sentiment - Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.016**	0.024	0.04**	0.10***	0.216***	0.16***	0.33***	0.096**
	(2.04)	(1.04)	(2.59)	(2.72)	(2.76)	(3.46)	(3.46)	(2.29)
BONDDSS x High Climate Risk Dummy	-0.0033	-0.004	-0.034	-0.12***	-0.26***	-0.167***	-0.36***	-0.116**
	(-0.05)	(-0.078)	(-1.06)	(-2.75)	(-3.07)	(-3.24)	(-3.69)	(-2.39)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	-0.029	-0.015	0.00	0.097**	0.23***	0.084*	0.27***	0.052
	(-0.46)	(-0.29)	(0.002)	(2.21)	(2.82)	(1.70)	(3.37)	(1.15)
BONDSS x Post Paris Accord Dummy	-0.003	-0.02	-0.028*	-0.10***	-0.21***	-0.091**	-0.26***	-0.051
	(-0.51)	(-1.04)	(-1.85	(-2.70)	(2.70)	(-2.07)	(-3.36)	(-1.26)
High Climate Risk Dummy	0.085	0.14***	0.046	0.058	0.115	0.039		-0.17*
	(1.43)	(2.88)	(0.76)	(1.32)	(0.96)	(0.62)		(-1.90)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.018	-0.135**	0.017	-0.036	-0.046	-0.005	-0.036	0.021
	(-0.27)	(-2.38)	(0.25)	(-0.69)	(-0.72)	(-0.09)	(-0.28)	(-0.40)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	420	420	420	420	424	424	424	424
Adj.R^2	-0.14	0.11	-0.08	0.16	-0.07	0.22	-0.02	0.23

IA2: Robustness check with alternate event - Trump Election for negative sentiment measure of the firm climate risk

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post Trump Election Dummy is 1 for quarters post Q4-2016 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Negative Sentiment		Negative Sentiment - Opportunity		Negative Sentiment - Regulatory		Negative Sentiment -Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.009***	0.007***	0.01***	0.007***	0.010***	0.007***	0.01***	0.008***
	(4.66)	(5.03)	(5.95)	(4.99)	(5.94)	(4.87)	(5.99)	(5.58)
BONDDSS x High Climate Risk Dummy	-0.019***	-0.009**	-0.018**	-0.008*	-0.013***	-0.004	-0.014***	-0.012***
	(-2.60)	(-2.17)	(-2.56)	(-1.86)	(-2.90)	(-1.00)	(-3.42)	(-3.03)
BONDSS x High Climate Risk Dummy x Post Trump Election Dummy	-0.097***	-0.093***	-0.107***	-0.112***	-0.047***	-0.048***	-0.030**	-0.037***
	(-2.80)	(-2.74)	(-2.93)	(-3.34)	(-2.97)	(-3.07)	(-2.15)	(-2.59)
BONDSS x Post Trump Election Dummy	0.001	-0.002	-0.002	-0.0016	-0.009***	-0.0015	-0.008***	-0.002
	(0.43)	(-1.17)	(-0.91)	(-1.05)	(-3.84)	(-0.99)	(-3.31)	(-1.36)
High Climate Risk Dummy	-0.094**	-0.068*	-0.128***	-0.102***	-0.144**	-0.105**	0.088	0.027
	(-2.13)	(-1.86)	(-2.59)	(-2.89)	(-2.34)	(-2.53)	(0.90)	(0.53)
High Climate Risk Dummy x PostTrump Election Dummy	0.15***	0.138	0.269***	0.24***	0.175***	0.154***	0.06	0.064
	(2.80)	(2.71)	(5.06)	(4.75)	(3.68)	(3.29)	(1.33)	(1.43)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	420	420	420	420	424	424	424	424
Adj.R^2	0.083	0.08	0.083	0.08	0.073	0.079	0.062	0.073

IA3: Robustness checks with alternate event- US withdrawal from Paris Accord for negative sentiment measure of climate risk

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post US withdrawal Dummy is 1 for quarters post Q2-2017 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. The We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Negative Sentiment		Negative Sentiment - Opportunity		Negative Sentiment - Regulatory		Negative Sentiment - Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.011	0.00	0.003	0.005	0.066***	0.10***	0.019*	0.084***
	(1.34)	(0.035)	(0.51)	(0.72)	(4.06)	(6.13)	(1.91)	(5.61)
BONDDSS x High Climate Risk Dummy	-0.016**	-0.005	-0.015**	-0.010*	-0.065***	-0.10***	-0.024**	-0.089***
	(-2.26)	(-0.87)	(-2.35)	(-1.65)	(-4.18)	(-6.37)	(-2.29)	(-6.00)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	-0.12**	-0.15***	0.049	0.032	-0.378***	-0.31***	-0.382***	-0.23***
	(-2.52)	(-4.22)	(1.59)	(1.36)	(-4.36)	(-3.93)	(-4.13)	(-3.38)
BONDSS x Post Paris Accord Dummy	0.004	0.004	-0.021	-0.025*	-0.06***	-0.081***	-0.037**	-0.067***
	(1.13)	(0.38)	(-1.14)	(-1.94)	(-3.34)	(-5.30)	(-2.08)	(-4.65)
High Climate Risk Dummy	0.10	0.026	0.055	-0.048	0.14	0.078	0.62**	0.12
	(1.62)	(0.59)	(0.74)	(-0.94)	(0.73)	(0.93)	(2.33)	(1.02)
High Climate Risk Dummy x Post Paris Accord Dummy	0.019	0.14**	-0.094	0.005	0.313***	0.32***	0.35***	0.28***
	(0.22)	(2.08)	(-1.12)	(0.71)	(3.85)	(4.28)	(4.16)	(3.84)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	396	396	408	408	412	412
Adj.R^2	-0.2	0.11	-0.14	0.08	0.01	0.21	-0.04	0.23

IA4: Robustness checks with alternate event- US State Climate Adaptation Plans for negative sentiment measure of climate risk

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post USSCAP Dummy is 1 for quarters post the quarter in which the state where the firm is headquartered implement State Climate Adaptation Plans and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. The We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Negative Sentiment		Negative Sentiment - Opportunity		Negative Sentiment - Regulatory		Negative Sentiment -Physical	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.021***	0.007*	0.003	0.005	0.066***	0.10***	0.019*	0.084***
	(6.19)	(1.79)	(0.51)	(0.72)	(4.06)	(6.13)	(1.91)	(5.61)
BONDDSS x High Climate Risk Dummy	-0.027***	-0.017***	-0.015**	-0.010*	-0.065***	-0.10***	-0.024**	-0.089***
	(-5.85)	(-3.42)	(-2.35)	(-1.65)	(-4.18)	(-6.37)	(-2.29)	(-6.00)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.02***	0.01	0.049	0.032	-0.378***	-0.31***	-0.382***	-0.23***
	(2.22)	(0.99)	(1.59)	(1.36)	(-4.36)	(-3.93)	(-4.13)	(-3.38)
BONDSS x Post Paris Accord Dummy	-0.002	0.001	-0.021	-0.025*	-0.06***	-0.081***	-0.037**	-0.067***
	(-0.38)	(0.089)	(-1.14)	(-1.94)	(-3.34)	(-5.30)	(-2.08)	(-4.65)
High Climate Risk Dummy	0.06	-0.01	0.055	-0.048	0.14	0.078	0.62**	0.12
	(1.32)	(-0.25)	(0.74)	(-0.94)	(0.73)	(0.93)	(2.33)	(1.02)
High Climate Risk Dummy x Post Paris Accord Dummy	0.08	0.14	-0.094	0.005	0.313***	0.32***	0.35***	0.28***
	(0.75)	(1.36)	(-1.12)	(0.71)	(3.85)	(4.28)	(4.16)	(3.84)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1336	1376	1408	1408	1364	1404	1404	1404
Adj.R^2	0.13	0.11	0.15	0.08	0.18	0.05	0.19	0.23

Table IA5: Robustness checks with alternate CDS Spreads for negative sentiment measure of climate risk

This table presents the results from the panel regression of the one quarter ahead 1,5,10,30 year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. The low climate risk firms are the firms in the first quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

Panel A

	Climate Exposure-Negative Sentiment				Climate Exposure-Negative Sentiment (Opportunity)			
	CDS1	CDS5	CDS10	CDS30	CDS1	CDS5	CDS10	CDS30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.21***	0.12***	0.085***	0.081***	0.22***	0.118***	0.08***	0.0798***
	(4.36)	(3.53)	(3.07)	(3.14)	(4.59)	(3.46)	(2.95)	(3.96)
BONDDSS x High Climate Risk Dummy	-0.28***	-0.142***	-0.09***	-0.094***	-0.28***	-0.136***	-0.093***	-0.091***
	(-5.26))	(-3.93)	(-3.41)	(--3.52)	(-5.34)	(-3.85)	(-3.29)	(-3.48)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.22***	0.107***	0.069***	0.074***	0.22***	0.108***	0.07***	0.072***
	(4.80)	(3.45)	(2.82)	(3.21)	(4.87)	(3.59)	(2.92)	(3.23)
BONDSS x Post Paris Accord Dummy	-0.17***	-0.099***	-0.065***	-0.07***	-0.17***	-0.102***	-0.067***	-0.0697***
	(-4.25)	(-3.40)	(-2.82)	(-3.23)	(-4.49)	(-3.59)	(-2.96)	(-3.33)
High Climate Risk Dummy	0.15	0.12	0.088	0.075				
	(1.01)	(1.05)	(0.97)	(0.89)				
High Climate Risk Dummy x Post Paris Accord Dummy	-0.19***	-0.0396	-0.04	-0.032	-0.19***	-0.030	-0.036	-0.018
	(-2.28)	(-0.64)	(-0.91)	(-0.72)	(-2.36)	(-0.51)	(-0.77)	(-0.42)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	420	420	420	420	420	420	420	420
Adj.R^2	-0.11	-0.13	-0.12	-0.11	-0.11	-0.071	-0.05	-0.04

Panel B								
	Climate Exposure-Negative Sentiment (Regulatory)				Climate Exposure-Negative Sentiment (Physical)			
	CDS1	CDS5	CDS10	CDS30	CDS1	CDS5	CDS10	CDS30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.11***	0.0712***	0.053***	0.059***	0.24***	0.135***	0.092***	0.089***
	(3.82)	(3.32)	(3.15)	(3.81)	(5.17)	(4.05)	(3.48)	(3.61)
BONDDSS x High Climate Risk Dummy	-0.16***	-0.088***	-0.066***	-0.071***	-0.29***	-0.15***	-0.10***	-0.10***
	(-4.28)	(-3.57)	(-3.41)	(-4.01)	(-5.71)	(-4.27)	(-3.73)	(-3.84)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.136***	0.067***	0.047**	0.055***	0.23***	0.113***	0.076***	0.077***
	(3.64)	(2.77)	(2.52)	(3.15)	(5.17)	(3.70)	(3.17)	(3.41)
BONDSS x Post Paris Accord Dummy	-0.10***	-0.063***	-0.045**	-0.052***	-0.19***	-0.109***	-0.074***	-0.075
	(-3.54)	(-2.92)	(-2.68)	(-3.41)	(-4.24)	(-3.82)	(-3.29)	(-3.60)
High Climate Risk Dummy	0.24***	-0.012	-0.013	0.015	0.075	-0.004	-0.016	-0.028
	(2.38)	(-0.16)	(0.23)	(0.28)	(0.35	(-0.023)	(-0.13)	(-0.24)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.051	0.009	0.002	-0.027	-0.17**	-0.017	-0.033	-0.018
	(-0.59)	(0.14)	(0.042)	(-0.60)	(-2.17)	(-0.28)	(-0.73)	(-0.42)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	424	424	424	424	424	424	424	424
Adj.R^2	-0.024	-0.0385	-0.04	-0.05	-0.019	-0.009	-0.033	-0.03

Table IA6: Robustness checks with alternate CDS Spreads for negative sentiment measure of climate risk

This table presents the results from the panel regression of the one quarter ahead 1,5,10,30 year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. The low climate risk firms are the firms in the other quartiles. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

Panel A

	Climate Exposure-Aggregate				Climate Exposure-Opportunity			
	CDS1	CDS5	CDS10	CDS30	CDS1	CDS5	CDS10	CDS30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	-0.031	0.004	0.006	0.002	0.009	0.010	0.011	0.006
	(-1.24)	(0.41)	(0.69)	(0.35	(0.39)	(0.92)	(1.24)	(0.75)
BONDDSS x High Climate Risk Dummy	0.013	-0.011	-0.012	-0.009	-0.0002	0.00	-0.004	0
	(0.45)	(-0.71)	(0.98)	(-0.77)	(-0.016)	(0.016)	(-0.35)	(-0.027)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	-0.035	0.00	0.002	0.001	-0.022	-0.011	-0.005	-0.008
	(-1.22)	(0.024)	(0.20)	-0.085	(-0.74)	(-0.68)	(-0.37)	(-0.64)
BONDSS x Post Paris Accord Dummy	0.030	-0.009	-0.009	-0.007	-0.006	-0.012	-0.013*	-0.009
	(1.29)	(-0.87)	(-1.28)	(-0.98)	(-0.22)	(-1.20)	(-1.69)	(-1.18)
High Climate Risk Dummy	-0.056	-0.008	0.006	-0.008	-0.038	-0.057	-0.02	-0.010
	(-0.98)	(-0.20)	(0.22)	(-0.26)	(-0.68)	(-1.48)	(-0.67	(-0.34)
High Climate Risk Dummy x Post Paris Accord Dummy	0.072	-0.05	-0.053	-0.031	0.037	-0.015	-0.036	-0.047
	(0.95	(-0.94)	(-0.89)	(-0.77)	(0.49)	(0.29)	(-0.88)	(-1.16)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	384	384	396	396	396	396
Adj.R^2	0.17	0.17	0.21	0.19	0.08	0.14	0.16	0.13

Panel B:

	Climate Exposure-Regulatory				Climate Exposure-Physical			
	CDS1	CDS5	CDS10	CDS30	CDS1	CDS5	CDS10	CDS30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.065**	0.064***	0.062***	0.052***	0.054*	0.062***	0.049***	0.038**
	(2.22)	(3.03)	(3.78)	(3.23)	(1.96)	(3.17)	(3.18)	(2.51)
BONDDSS x High Climate Risk Dummy	-0.101***	-0.074***	-0.072***	-0.061***	-0.084**	-0.065***	-0.052***	-0.042**
	(-2.61)	(-3.10)	(-3.87)	(3.34)	(-2.38)	(-2.94)	(-3.01)	(-2.41)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.074**	0.047**	0.053***	0.045***	0.063*	0.041*	0.034**	0.026
	(2.00)	(2.09)	(3.04)	(2.61)	(1.81)	(1.93)	(2.04)	(1.55)
BONDSS x Post Paris Accord Dummy	-0.056*	-0.049**	-0.054***	-0.046***	-0.046*	-0.047**	-0.039***	-0.031**
	(-1.94)	(-2.47)	(-3.52)	(-3.06)	(-1.72)	(-2.47)	(-2.61)	(-2.07)
High Climate Risk Dummy	0.035	-0.047	-0.007	0.009	0.23	0.002	0.022	0.038
	(0.55)	(-1.07)	(-0.22)	(0.27)	(0.28	(0.031)	(0.49)	(0.86)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.007	0.013	-0.018	-0.051	-0.16**	-0.021	-0.046	-0.051
	(-0.93)	(0.23)	(-0.42)	(-1.22)	(-2.15)	(-0.40)	(-1.12)	(-1.21)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	408	408	408	408	412	412	412	412
Adj.R^2	0.19	0.28	0.28	0.25	0.097	0.15	0.16	0.13

Table IA7: Robustness checks with alternate CDS Spreads for negative sentiment measure of climate risk

This table presents the results from the panel regression of the one quarter ahead 1,5,10,30 year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. The low climate risk firms are the firms in the other quartiles. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

Panel A

	Climate Exposure-Negative Sentiment				Climate Exposure-Negative Sentiment(Opportunity)			
	CDS1	CDS5	CDS10	CDS30	CDS1	CDS5	CDS10	CDS30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.019	0.013	0.012	0.01	0.079***	0.073***	0.074***	0.067***
	(1.03)	(1.22)	(1.49)	(1.23)	(2.90)	(3.80)	(4.88)	(4.57)
BONDDSS x High Climate Risk Dummy	0.024	0.006	0.01	0.015	-0.12***	-0.081***	-0.081***	-0.074***
	(0.63)	(0.20)	(0.46)	(0.72)	(-3.34)	(-3.73)	(-4.82)	(-4.53)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	-0.029	-0.015	-0.017	-0.021	0.098***	0.068***	0.068***	0.06***
	(-0.74)	(-0.54)	(-0.77)	(-0.99)	(2.79)	(3.13)	(4.02)	(3.67)
BONDSS x Post Paris Accord Dummy	-0.024	-0.011	-0.012	-0.011	-0.08	-0.071***	-0.070***	-0.063**
	(-1.32)	(-1.13)	(-1.61)	(-1.40)	(-3.02)	(-3.70)	(-4.76)	(-4.36)
High Climate Risk Dummy	0.165**	0.128***	0.096***	0.10***	0.094	0.071	0.077**	0.093***
	(2.55)	(2.68)	(2.62)	(2.77)	(1.56)	(1.66)	(2.33)	(2.91)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.21***	-0.127**	-0.104**	-0.11**	-0.124	-0.048	-0.059	-0.053
	(-2.71)	(-2.17)	(2.34)	(-2.56)	(-1.62)	(-0.91)	(-1.45)	(-1.31)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	420	420	420	420	420	420	420	420
Adj.R^2	0.05	0.11	0.11	0.095	0.13	0.17	0.22	0.19

Panel B:

	Climate Exposure-Negative Sentiment (Regulatory)				Climate Exposure-Negative Sentiment(Physical)			
	CDS1	CDS5	CDS10	CDS30	CDS1	CDS5	CDS10	CDS30
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.094***	0.093***	0.077***	0.068***	0.074**	0.071***	0.059***	0.051***
	(3.08)	(-4.30)	(4.51)	(4.07)	(2.54)	(3.40)	(3.56)	(3.13)
BONDDSS x High Climate Risk Dummy	-0.14***	-0.101***	-0.084***	-0.076***	-0.12***	-0.083***	-0.069***	-0.061***
	(-3.75)	(-4.19)	(-4.45)	(-4.09)	(-3.29)	(-3.55)	(-3.75)	(-3.35)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.12***	0.064***	0.058	0.052***	0.101***	0.052**	0.048***	0.042**
	(3.21)	(2.84)	(3.27)	(2.93)	(2.85)	(2.38)	(2.76)	(2.49)
BONDSS x Post Paris Accord Dummy	-0.085***	-0.066***	-0.060***	-0.053***	-0.069**	-0.051***	-0.047***	-0.042***
	(-2.95)	(-3.26)	(-3.75)	(-3.32)	(-2.55)	(-2.62)	(-3.07)	(-2.76)
High Climate Risk Dummy	0.12	0.040	0.065	0.071	-0.26**	-0.17*	-0.065	-0.021
	(1.43)	(0.66)	(1.38)	(1.52)	(-2.09)	(-1.92)	(-0.93)	(-0.31)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.21***	-0.015	-0.040	-0.037	-0.19**	0.010	-0.019	-0.022
	(-2.64)	(-0.26)	(-0.90)	(-0.84)	(-2.43)	(0.18)	(-0.45)	(-0.51)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	424	424	424	424	424	424	424	424
Adj.R^2	0.18	0.24	0.24	0.24	0.18	0.23	0.22	0.18

Table IA8: Relation between Bond Short Selling and future CDS Spread for different bond tenors

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their climate risk scores from Sautner et. al. The high climate risk firms are the firms in the fourth quartile. The low climate risk firms are the firms in the first quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We divide the bonds into short term (<5 years), medium term(5-<10 years) and long term(>=10years) based on the time to maturity. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Climate Exposure-Aggregate			Climate Exposure-Opportunity			Climate Exposure-Regulatory			Climate Exposure-Physical		
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long	Short	Medium	Long
BONDSS	0.022**	0.002	0.004	0.016*	0.004	0.010	0.004	0.038***	0.064***	0.015*	0.049***	0.062***
	(2.53)	(0.34)	(0.41)	(1.71)	(0.63)	(0.92)	(0.61)	(2.60)	(3.03)	(1.69)	(3.52)	(3.17)
BONDDSS x High Climate Risk Dummy	-0.033	-0.007	-0.011	0.007	-0.002	0.00	0.051*	-0.047***	-0.074***	-0.041	-0.052***	-0.065***
	(-0.73)	(0.65)	(-0.71)	(0.92)	(-0.25)	(0.016)	(1.83)	(-2.91)	(-3.10)	(-0.96)	(-3.37)	(-2.94)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.054	0.001	0.00	0.011	-0.004	-0.011	-0.034	0.034**	0.047**	0.031	0.038**	0.041*
	(1.17)	(0.06)	(0.024)	(0.37)	(-0.38)	(-0.68)	(-0.39)	(2.22)	(2.09)	(0.38)	(2.52)	(1.93)
BONDSS x Post Paris Accord Dummy	-0.011	-0.007	-0.009	-0.008	-0.008	-0.012	0.007	-0.036***	-0.049**	-0.011	-0.044***	-0.047**
	(-1.31)	(-1.15)	(-0.87)	(-0.98)	(-1.16)	(-1.20)	(0.94)	(-2.58)	(-2.47)	(-1.21)	(-3.15)	(-2.47)
High Climate Risk Dummy	0.038	-0.002	-0.008	-0.027	-0.059	-0.057	-0.21**	-0.06	-0.047	0.008	0.006	0.002
	(0.39)	(-0.04)	(-0.20)	(-0.36)	(-1.38)	(-1.48)	(-2.42)	(-1.30)	(-1.07)	(0.067)	(0.098)	(0.031)
High Climate Risk Dummy x Post Paris Accord Dummy	-0.18	-0.041	-0.05	-0.082	-0.001	-0.015	0.21*	0.004	0.013	-0.019	-0.03	-0.021
	(-1.66)	(-0.69)	(-0.94)	(-0.74)	(-0.018)	(0.29)	(1.68)	(0.076)	(0.23)	(-0.16)	(-0.53)	(-0.40)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	384	384	384	396	396	396	408	408	408	412	412	412
Adj.R^2	0.27	0.16	0.17	0.26	0.13	0.14	0.33	0.28	0.28	0.073	0.17	0.15

IA9: Robustness checks with difference in carbon emissions from industry average as proxy for climate risk

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on the difference between the carbon emissions and industry average-total,scope1,scope2 and scope3. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/-8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Carbon Emission-Total		Carbon Emission-Scope 1		Carbon Emission-Scope 2		Carbon Emission-Scope 3	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.013***	0.009***	0.01***	0.009***	0.015***	0.01***	-0.004	0.001
	(3.75)	(3.60)	(3.10)	(3.60)	(4.02)	(4.01)	(-0.30)	(0.21)
BONDDSS x High Climate Risk Dummy	-0.001	0.00	-0.00	0.00	-0.004	-0.002	0.003	-0.003
	(-0.26)	(0.06)	(-0.002)	(0.06)	(-0.69)	(-0.53)	(0.16)	(-0.17)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	-0.00	-0.002	0.003	-0.002	0.001	0.003	-0.015	-0.004
	(-0.14)	(-0.26)	(0.46)	(-0.26)	(0.16	(0.53)	(-0.64)	(-0.22)
BONDSS x Post Paris Accord Dummy	-0.003	-0.00	-0.005**	-0.00	-0.004*	-0.003*	0.017*	0.01*
	(-1.37)	(-0.06)	(-2.26)	(-0.06)	(-1.84)	(-1.67)	(1.88)	(1.97)
High Climate Risk Dummy	-0.08	-0.04	-0.11*	-0.04	-0.07	-0.03	-0.12	-0.005
	(-1.51)	(-1.61)	(-1.65)	(-1.61)	(-1.01)	(-1.02)	(-0.40)	(-0.17)
High Climate Risk Dummy x Post Paris Accord Dummy	0.08	0.078**	-0.003	0.078**	0.02	0.045	0.005	0.02
	(1.31)	(2.34)	(-0.04)	(2.34)	(0.28)	(1.17)	(0.52)	(0.38)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1106	2160	969	1888	934	1820	623	1212
Adj. R^2	0.03	0.1	-0.02	0.05	-0.01	0.03	-0.01	0.06

IA10: Robustness checks with change in carbon emissions as proxy for climate risk

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on the change in carbon emissions-total,scope1,scope2 and scope3. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Carbon Emission-Total		Carbon Emission-Scope 1		Carbon Emission-Scope 2		Carbon Emission-Scope 3	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.006*	0.011***	0.003	0.009***	0.005*	-0.002	-0.006	0.00
	(1.77)	(5.02)	(1.11)	(3.96)	(1.73)	(-0.49)	(-0.85)	(0.042)
BONDDSS x High Climate Risk Dummy	0.003	0.00	0.002	0.00	0.002	-0.003	0.02	0.009
	(0.87)	(0.045)	(0.72)	(0.13)	(0.72)	(-0.69)	(1.19)	(0.55)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	-0.004	-0.003	-0.002	-0.002	-0.004	0.004	-0.03	-0.017
	(-1.12)	(-0.81)	(-0.54)	(-0.08)	(-1.04)	(0.89)	(-1.62)	(-1.04)
BONDSS x Post Paris Accord Dummy	0.00	-0.003*	-0.002	-0.003	0.00	-0.004	0.018**	0.011**
	(0.05)	(-1.82)	(-0.51)	(-1.56)	(0.05	(-1.33)	(2.33)	(2.24)
High Climate Risk Dummy	-0.08	-0.24*		-0.04		0.026		-0.48***
	(-1.51)	(-1.89)		(-0.25)		(0.52)		(-3.28)
High Climate Risk Dummy x Post Paris Accord Dummy	0.08	0.04		-0.27		0.07		0.26
	(1.31)	(0.15)		(-0.87)		(1.03)		(0.95)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1105	2156	967	1800	930	1800	625	1216
Adj.R^2	0.01	0.08	0.05	0.02	0.02	-0.02	0.05	0.05

IA11: Robustness checks with carbon emissions intensity as proxy for credit risk

This table presents the results from the panel regression of the one quarter ahead 5–year CDS spread (CDS5) for firm i at the end of month t. BONDSS is the value–weighted average (the number of bonds shorted over the bond offering amount) of the daily short interest of all the bonds of firm i in month t–1. The High Climate Risk Dummy is 1 for high climate risk firms and 0 for low climate risk firms. The firms are divided into quartiles based on their carbon emissions intensity(carbon emissions/total sales)-total,scope1,scope2 and scope3. The high climate risk firms are the firms in the fourth quartile. In columns 1,3,5,7 the low climate risk firms are the firms in the first quartile and in column 2,4,6,8, the low climate risk firms include rest of the quartile. The Post Paris Accord Dummy is 1 for quarters post December 2015 and 0 otherwise. We consider event +/- 8 quarters for the analysis. We use the 1:3 PSM matching in this regression. The sample period is from Feb–2006 to Dec–2020. We use firm fundamental variables (SIZE; LEVERAGE; TANGIBILITY; CASH; ROA;CAPEX) as the control variables, and b) macro–financial variables (TSYIELD1, TSSLOPE and MKTRET) as additional controls in estimations. We winsorize continuous variables at the 1st and 99th percentile. The standard errors are clustered by firm and by quarter. ***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 level, respectively. The values in parentheses are the t–statistics of the estimated coefficients. Variable definitions are provided in the Appendix A1.

	Carbon Emission-Total		Carbon Emission-Scope 1		Carbon Emission-Scope 2		Carbon Emission-Scope 3	
	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5	CDS5
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BONDSS	0.018***	0.011***	0.003	0.008***	0.02***	0.009***	-0.001	0.001
	(4.36)	(4.95)	(0.87)	(3.37)	(4.92)	(4.03)	(-0.16)	(0.31)
BONDDSS x High Climate Risk Dummy	0.00	0.00	0.003	0.003	-0.01	-0.001	-0.003	-0.003
	(0.07)	(0.098)	(0.93)	(1.47)	(-1.33)	(-0.38)	(1.19)	(-0.49)
BONDSS x High Climate Risk Dummy x Post Paris Accord Dummy	0.003	0.004	-0.016***	-0.004	0.01	0.006	-0.01	-0.01
	(0.56)	(0.94)	(-2.96)	(-1.03)	(1.29)	(1.13)	(-0.67)	(-0.75)
BONDSS x Post Paris Accord Dummy	-0.01**	-0.004***	0.01**	-0.002	-0.01***	-0.003	0.01*	0.012**
	(-2.17)	(-2.40)	(2.19)	(-0.74)	(-2.52)	(-1.71)	(1.90)	(2.33)
High Climate Risk Dummy	-0.11*	-0.04	-0.09	-0.04	-0.01	-0.013	-0.12	-0.005
	(-1.97)	(-0.89)	(-1.42)	(-1.49)	(-0.12)	(-0.43)	(-1.24)	(-0.15)
High Climate Risk Dummy x Post Paris Accord Dummy	0.056	0.018	0.06	0.06*	-0.05	-0.007	0.06	-0.008
	(0.93)	(0.55)	(0.87)	(1.62)	(-0.72)	(-0.06)	(0.51)	(-0.15)
Firm Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Macroeconomic Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1083	2140	937	1868	903	1800	606	1234
Adj.R^2	0.09	0.11	0.02	0.06	-0.01	0.05	0.012	0.10