Do salient climatic risks affect shareholder voting?

Eliezer M. Fich
Drexel University
LeBow College of Business
Philadelphia, PA USA 19104
emf35@drexel.edu

Guosong Xu
Erasmus University
Rotterdam School of Management
Postbus 1738, 3000 DR Rotterdam
xu@rsm.nl

August 23, 2021

Abstract

Shareholders in locations recently hit by hurricanes significantly increase their support for environmental proposals even if they never previously voted for similar initiatives. Our results show that changed beliefs about salient climate risks rather than firms' fundamentals drive the increased support. More favorable voting following a hurricane strike has real consequences: Climate-related proposals are more likely to pass, and when they do, firm performance weakens. These findings highlight the role of investor psychology in altering shareholders' perceptions about climate risks and, consequently, their support for corporate environmental policies.

Keywords: ESG, Shareholder Voting, Climate Change, Salience
JEL codes: D72; G30; G41; Q54

> "*Not that global warming isn't happening, just you can get so excited and make crazy extrapolations that are not necessarily correct*."
>
> – Charlie Munger, vice chairman of Berkshire Hathaway[1]

1. Introduction

The shareholder proposal process is a fundamental channel through which investors engage top managers of the firms in their portfolios. Climate change-related proposals have increased steadily in recent years reflecting growing investor demand for corporate accountability around this issue.[2] Despite this, environmental proposals rarely receive wide support: From 2006 to 2020, only 2.8% of such proposals pass during shareholder meetings. In this paper, we study whether shareholders' beliefs about climate risk influence their support for environmental proposals.

We hypothesize that salient climate risks affect shareholders' appraisal of a firm's climate-related risk and, in turn, their support for environmental proposals. Our hypothesis is rooted on the behavioral theory by Bordalo, Gennaioli, and Shleifer (2012, 2013) positing that salient risks can lead investors to overweight a tail event and distort their beliefs about a project's expected value. Studying this hypothesis enables us to shed light on two empirically open questions. The first is whether shareholders' beliefs about climate change alter their support for environmental proposals, which is often very low. The other question is whether environmental proposals affect firm value. If investors generally underreact to climate risks, an increase in support for climate-related initiatives should improve shareholder wealth. Conversely, if salience leads to the extrapolation of the benefit of an environmental proposal, as implied in the above quote by prominent investor Charlie Munger, then the passing of climate-related initiatives should weaken firm performance.

[1] See https://www.cnbc.com/2019/03/25/heres-what-warren-buffett-thinks-about-climate-change-and-investing.html
[2] See https://www.wsj.com/articles/climate-changeand-ideas-for-tackling-itdominated-davos-11579896026), and https://corpgov.law.harvard.edu/2016/09/06/climate-change-sustainability-and-other-environmental-proposals/

There is growing consensus that beliefs play an important role in investor behavior. The existing literature on beliefs about climate risks focuses predominantly on how the perception of salient climate risks affects asset prices (Alok, Kumar, and Wermers, 2020; Choi, Gao, and Jiang, 2020; Giglio, Maggiori, Stroebel, and Weber, 2020). However, to the best of our knowledge, there is no evidence on whether such a perception affects the most direct form of shareholder engagement in corporate environmental policies: shareholder voting.

Examining the relation between perceived climate risks and shareholder voting poses several empirical challenges. A firm's exposure to climate risks is likely correlated with other unobserved firm-specific characteristics. For example, a firm located in a coastal area (hence exposed to the high risks involving rising sea levels) may need specialized production technologies that make the implementation of an environmental proposal costlier. Failure to account for such hard-to-observe firm-specific characteristics raises concerns about an omitted-variable bias. Furthermore, climate change is slow-moving, and firm-level climate risk exposure usually lacks meaningful time-series variation required for empirical identification (Giglio, Maggiori, Stroebel, and Weber, 2020).

To circumvent these empirical challenges, we introduce a measure of perceived climate risks that varies at the shareholder level. Specifically, we consider mutual fund shareholders' recent exposure to salient weather events by identifying hurricanes that hit a mutual fund headquarter location. We conjecture that experiencing a salient (catastrophic) weather event increases fund managers' subjective assessment of the climate risks faced by their portfolio firms. However, hurricane strikes are unlikely to alter the actual climate-related risk of a given portfolio company (particularly if it is located outside the hurricane area). During shareholder meetings that occur right after the hurricane, we examine whether hurricane-affected shareholders are more supportive towards environmental proposals than unaffected shareholders. Because our tests control for *proposal fixed effects*, our empirical strategy allows us to effectively isolate the effect of perceived climate risks on shareholder voting without the concern that firm-level climate risks are endogenous and slow-moving. Moreover, because hurricane strikes are as good as random (Dessaint and Matray, 2017), our experimental design allows us to establish the causal effects of salient climate events.

We document several key findings. Heterogeneity in climate risk perceptions across shareholders translates into differences in revealed voting behavior. Funds in areas hit by a hurricane are significantly more likely to vote for an environmental proposal immediately after the strike. This result also holds in the subset of funds located in hurricane-afflicted counties (i.e., counties with at least one hurricane strike over our sample period, from 2006 to 2020) and for funds that never previously endorsed similar initiatives. Here, the likelihood of support by funds with a recent hurricane event is about 38 percent higher than the support by other funds. Moreover, we observe that the increase in support rate is temporary: hurricane-afflicted shareholders reverse their support about three years after the strike. This pattern is consistent with existing work showing that climate-related overreactions subside as attention to this issue dissipates (Chang, Huang, and Wang, 2018). According to our analyses, fund characteristics like size, performance, flows, and attitudes towards Environmental, Social, and Corporate Governance (ESG) issues cannot explain our findings. Notably, the unconditional support rates for climate proposals are not different among funds in and outside hurricane counties in years without a hurricane strike. Therefore, shareholders' changed perception about climate risks likely explains their higher support for environmental initiatives after a hurricane strike.

Starks, Venkat, and Zhu (2017) show that institutional investors with longer horizons tend to prefer firms with higher ESG ratings more than do short-term investors. He, Kahraman, and Lowry

(2020) find an inverse correlation between the investment horizon of mutual funds and their support for environmental and social proposals. To the extent that ESG funds have greater awareness towards climate issues, their response to environmental proposals should be less dependent on behavioral factors such as recent exposure to a salient weather event. This conjecture is borne in the data. Additionally, and consistent with Iliev and Lowry (2015), we find that a fund's overreaction to perceived climate risks is a function of its stake in the portfolio company. Moreover, the sensitivity towards perceived climate risk is higher for firms in high pollution sectors, such as Petroleum and Natural Gas, Construction, and Chemicals (Hsu, Li, and Tsou, 2020), and for firms closer to a hurricane disaster area.

Next, we show that hurricane-affected funds that support a climate proposal play a crucial role in the voting outcomes. These funds raise the overall approval rates of a proposal: Increasing the treated funds' share of supportive votes by one standard deviation is associated with a 7 percent increase in the overall approval rate. The increase in the approval rate is materially important as it improves the odds that the proposal receives enough votes during the shareholder meeting. On average, a one standard deviation increase in the treated funds' share of supportive votes leads to a 1.1 percentage points increase in the likelihood that the proposal passes (relative to the mean passage rate of 2.8 percent in our sample). This evidence suggests that in the aggregate, shareholders' perception of climate change risks has an economically important impact on corporate environmental policies.

Finally, we address one of the thorniest questions in the debate on whether ESG proposals in general, and climate-change related proposals in particular, create firm value. On one side of the debate stands the evidence by Di Giuli and Kostovetsky (2014). They find an association between corporate ESG initiatives and subsequent (stock and accounting) underperformance. Likewise, Buchanan, Cao, and Chen (2018) find that firms with high ESG scores exhibit a larger drop in market value during the financial crisis. On the other side of the debate, work by Ferrell, Liang, and Renneboog (2016) shows a positive association between ESG scores and firm value measured by Tobin's *q*. Similarly, the evidence in Dimson, Karakas, and Li (2015) and Flammer (2015) suggests that ESG engagements and proposals tend to increase shareholder wealth. Reconciling this evidence is problematic for at least two reasons. One is that most studies in this area bundle environmental, social, and governance initiatives. The other problem is that ESG scores vary substantially by ratings provider (Berg, Koelbel, and Rigobon, 2020; Chatterji, Durand, Levine, Touboul, 2016).

To sidestep these issues, we instrument the passage of an environmental proposal with the share of voting support by funds located in areas recently hit by hurricanes. Because hurricane strikes are exogenous, they are unlikely to affect the performance of firms (located outside a hurricane region) in ways other than through the passage of climate proposals. As a result, our identification strategy allows us to establish a plausibly causal impact of such proposals. We find that abnormal returns on the voting date are 3.7% lower for firms that pass a climate proposal than for firms for which a similar proposal fails. Companies that approve environmental proposals also exhibit lower long-term stock returns and accounting underperformance. Our findings are consistent with the evidence in Fisher-Vanden and Thorburn (2011) showing negative investor reactions to the firms that join environmental programs.

We perform further tests in order to assess the robustness of our baseline findings. We begin by noting that our main results also obtain in analyses in which we use alternative and more stringent rules to define our treatment and control groups and to select firms that submit an environmental proposal for a vote. Moreover, in a set of placebo analyses, we replace climate-related proposals with non-environmental proposals (e.g., governance-, say-on-pay-, M&A-, or accounting-related). The placebo results indicate that the hurricane treatment does not affect voting support for non-environmental proposals. Finally, we validate our findings with a different environmental disaster, wildfires. The evidence from this alternative construct renders further support for our hypothesis that salient environmental events alter shareholders' perception of a firm's climate-related risk.

This paper contributes to the recent literature on the impact of investor perceptions about climate change risks. Recent work in this area shows that beliefs about climate disasters and risks affect professional money managers' portfolio choices (Alok, Kumar, and Wermers, 2020; Krueger, Sautner, and Starks, 2020) and asset prices (Hong, Li, and Xu, 2019; Bolton and Kacperczyk, 2020; Engel et al., 2020; Giglio, Maggiori, Stroebel, and Weber, 2020; Hsu, Li, and Tsou, 2020). Other studies show that attention to high local temperature distorts trading volume and returns in stock markets (Choi, Gao, and Jiang, 2019).[3] Our paper advances this literature by documenting a link between investors' beliefs about environmental risks and their engagement through shareholder voting—a crucial channel that directly shapes firms' climate-change policies.

Our work also is related to the literature studying the association between ESG proposals and shareholder wealth.[4] We advance this literature by showing that investor psychology affects this association. Indeed, according to our results, shareholder beliefs about climate risks prompt them to extrapolate the value of environmental proposals, which, in turn, weakens firm performance. Moreover, by focusing solely on climate-related proposals we circumvent two critical problems that plague this literature: (1) the aggregation of environmental, social, and governance initiatives and (2) the substantial discrepancy in ESG scores among the various providers of this metric.

[3] Other studies that examine the implications of climate risks include Hirshleifer (2001), Kaplanski and Levy (2010), Goetzmann et al. (2014), Dessaint and Matray (2017), Addoum, Ng, and Ortiz-Bobea (2020), Bernile et al. (2020), Giglio, Kelly, and Stroebel (2020).

[4] See Gillan, Koch, and Starks (2021) for a review of this literature.

Our evidence on the increased voting support for environmental proposals by mutual funds that recently experience a hurricane, supports the conclusion in concurrent work by Alok, Kumar, and Wermers (2020) and Andonov and Rauh (2020) that institutional investors exhibit extrapolative behavior.[5]

2. Sample characteristics and empirical strategy

2.1. Climate-related proposals

Our sample starts with the universe of mutual funds covered by the Institutional Shareholder Services (ISS) Voting Analytics database from 2006 to 2020. ISS compiles nearly all mutual funds' voting records by US public firms from their filings with the Securities and Exchange Commission (SEC). Because we are interested in shareholders' support for climate proposals, we identify initiatives related to environmental issues following the procedure in He, Kahraman, and Lowry (2020). Environmental proposals include those that reduce carbon emissions and those that mandate the use of renewable energies. ISS reports the voting dates, fund names, fund families, and fund-level vote ("for" or "against") on each proposal. ISS, however, does not provide the geographical information of the funds. Therefore, we search in the SEC's EDGAR database and extract the fund's headquarter address, including state, city, and zip code. We then map the fund's zip code to the Census 2010 county Federal Information Processing Standards (FIPS) code,[6] which we use to identify hurricane locations. We eliminate funds with missing headquarter locations. We

[5] Andonov and Rauh (2020) find that institutional shareholders rely on previous performance to set future return expectations, and that these extrapolative expectations affect their target asset allocations.

[6] See the crosswalk files from the US Census Bureau (https://www2.census.gov/census_2010/04-Summary_File_1/) and from the National Bureau of Economic Research (https://data.nber.org/data/census-2010-zip-code-state-county-data.html). When we cannot determine a fund's address (mainly due to name mismatches), we drop it from our sample.

also exclude firms in locations directly hit by a hurricane (i.e., firms headquartered in a hurricane disaster zone).[7] This process yields a baseline sample of 357,649 vote-level observations.

Figure 1 provides an overview of the climate-related proposals from ISS. The proportion of climate-related proposals (as a percentage of all shareholder-sponsored proposals) increases from 7% in 2006 to 12% in 2017, and then decreases to 6% in 2020. This pattern is consistent with the climate-risk exposure reported by Sautner, van Lent, Vilkov, and Zhang (2020). They show that attention to climate change rises from the mid-2000s, reaching a plateau in 2011, declining slightly in 2012 (the year of the Doha Climate Summit) before increasing again until 2018. Figure 1 also reports shareholder support for these proposals. Shareholder support is the percentage of "for" votes at the proposal level. Consistent with previous work (Grewal, Serafeim, and Yoon, 2016; He, Kahraman, and Lowry, 2020), shareholder support for climate-related proposals is surprisingly low. The share of "for" votes is 14% in 2006, rising to 19% in 2020. The average support rate is 20% across our sample period, substantially below the typical 50% threshold required for approval. For reference, the average support for non-climate proposals voted at shareholder meetings during our sample period stands at 40%.

2.2. Hurricanes

We collect hurricane data between January 2005 and December 2020 directly from the National Centers for Environmental Information (NCEI). For each hurricane, NCEI reports the start and end dates, state and zone FIPS codes, and estimated damage value.[8] Because we seek to identify

[7] We elaborate on the rationale for this exclusion in Section 2.4.
[8] We use crosswalk files from National Weather Service (NWS) to transform NCEI five-digit State and Public Forecast Zone FIPS to county FIPS (see https://www.weather.gov/gis/ZoneCounty). For the value of estimated losses, we crosscheck our data with the damage values reported by the National Oceanic and Atmospheric Administration's NWS.

events that have a material impact on the funds' perception of climate risks, we focus on hurricane strikes with a total direct damage of above $50 million (inflation adjusted in 2010 dollars).

Panel B of Table 1 shows the 20 hurricane strikes that we study. In total, these hurricanes are responsible for over 1,790 direct fatalities in the US mainland with an estimated economic damage of over $431 billion. Though we focus on hurricanes that account for over $50 million in direct losses, 16 out of the 20 hurricanes are independently responsible for over $1 billion in economic damages.

2.3. Control variables

We calculate the geographical distance between the fund headquarter and the portfolio company using Vincenty's (1975) formula. We obtain fund characteristics, including total net assets (TNA), monthly returns, expense ratio, turnover, and fund flows, from the CRSP mutual fund database. Because there is no unique fund identifier that is common to the ISS and CRSP databases, we follow Matvos and Ostrovsky (2010) and Iliev and Lowry (2015) and manually match funds from these two data sources.[9] Following this procedure, we obtain 131,347 votes with fund-level data available (hereafter, *ISS-CRSP matched sample*). We collect data for firm characteristics from Compustat. Our baseline sample of 357,649 votes represents 750 unique proposals. Matching these proposals with firm characteristics in the year prior to the vote, yields 716 proposals.

To conserve space, we report the definition for all variables in the Appendix. Panel A of Table 1 reports summary statistics for key fund and firm characteristics.[10] On average, the distance between a mutual fund and a portfolio company is 1,185 miles. The average fund size, measured

---

[9] Specifically, we download all fund names and tickers from the mandatory semi-annual reports from SEC's EDGAR database, and match the ISS data to the EDGAR data. We then match the sample with the CRSP mutual fund database by fund tickers.
[10] We winsorize continuous variables at the 1st and 99th percentiles to minimize the influence of extreme outliers.

with TNA, in our ISS-CRSP matched sample is $352 million. The mean monthly fund return is 1.3%. These statistics are largely consistent with those reported by Shive and Yun (2013) and Franzoni and Schmalz (2017). The average total asset value of a portfolio firm is $25 billion. At the vote level, the likelihood of a mutual fund supporting an environmental proposal is 25.5%. Focusing on the firm-level statistics, 63% of climate proposals receive a "for" recommendation from ISS. Nevertheless, because of the low shareholder support, only 2.8% of these proposals pass. This incidence is slightly higher than the approval rate of 1.9% for all CSR proposals that are considered between 1997 and 2012 (reported by Flammer, 2015).

2.4. Identification strategy

Because we intend to examine the effect of perceived climate risks on shareholders' voting behavior, we rely on hurricane strikes that hit a mutual fund's location county for identification. Two conditions must be met for this setting to be suitable. The first condition seems to be satisfied because hurricanes can randomly strike a large fraction of the US territory and their occurrence is unpredictable (Dessaint and Matray, 2017). Moreover, since 1850 the frequency of hurricanes has been largely stationary (Elsner and Bossak, 2001; Pielke et al., 2005; Pielke et al., 2008). These features allow us to view the shock to mutual funds to be as good as random, an assumption that is important for establishing a causal effect.

The second condition is that hurricanes can affect investors' beliefs about the salient climate risks. Existing academic work suggests that this condition is also satisfied. In this regard, we note that previous research shows that investors, managers, and consumers are sensitive to extreme weather conditions.[11] Consequently, the existing academic evidence supports our assumption that

[11] For example, Dessaint and Matray (2017) show that managers temporarily increase cash holdings and express more concerns about climate risks when their neighborhoods experience a hurricane (see also Ramirez and Altay, 2011). Chang, Huang, and Wang (2018) find that sales of health insurance temporarily increase when the air is polluted. Alok,

hurricanes create meaningful variation in the awareness of climate risks at the investor level, which may affect their reaction to corporate environmental policies.

Our main test compares the voting behavior between funds recently affected by a major hurricane (hereafter, *treated funds*) and other unaffected funds (hereafter, *control funds*), for the same climate-related proposal. Consider the following example. In April 2009, shareholders of The Ryland Group in California brought a proposal that required the firm to "adopt quantitative greenhouse gas emission goals" up for vote. Among Ryland's shareholders was the Small Cap Fund of Variable Annuity Life Insurance Company, located in Harris County, Texas. Hurricane Ike ravaged Harris County just a few months earlier. In line with our sample selection criteria, neither Ryland nor the Small Cap Fund suffered any physical damage from Ike. We ask whether the Small Cap Fund is more likely to support the climate proposal than other unaffected funds. Because we make the comparison among shareholders voting for the *same* proposal, any firm or proposal-level characteristics cannot explain the difference of voting behavior at the shareholder level. Notably, we exclude firms that are directly affected by a hurricane and therefore, we are able to cleanly capture the effects of shareholder beliefs while isolating any effects driven by a firm's fundamentals. To do so, we estimate the following regression:

$$\textit{Vote-For}_{i,j,t} = \alpha + \beta \cdot \textit{Hurricane}_{i,j,t} + \text{Proposal}_{j,t} + \text{Fund}_{i} + \text{Controls}_{i,t} + \epsilon_{i,t} \qquad (1)$$

where *Vote-For* is an indicator variable that equals one if fund i supports proposal j, and zero otherwise. Importantly, the inclusion of proposal fixed effects, *Proposal*, ensures that all comparisons are made within the same proposal. We do not need to control for time-varying or unvarying firm characteristics because the proposal fixed effects absorb all these covariates. We

---

Kumar, and Wermers (2020) find fund managers overreact to climatic disasters when they make portfolio decisions. Choi, Gao, and Jiang (2020) report that people revise their beliefs about climate changes when the local temperature is abnormally high and that carbon-intensive firms underperform in such weather.

control for geographical distance between the fund and the firm in all regressions. We additionally include fund fixed effects to consider a fund's general attitude towards ESG issues. For our ISS-CRSP matched sample, we also control for fund size (TNA in logarithm), expense ratio, turnover, monthly return, and flows, all measured in the month prior to the vote.

The independent variable of interest in equation (1) is *Hurricane*, an indicator variable that flags treated funds in year *t*. We define a fund as treated if the fund is headquartered in a county hit by a hurricane (*disaster zone*), or in an adjacent neighboring county to the disaster zone, over the past 12 months running up to the shareholder meeting. We include neighboring counties following Dessaint and Matray (2017), who show that managers in these adjacent counties are clearly affected by the salience of a hurricane due to their proximity to the disaster area. The fact that shareholders "nearly miss" the event, could equally remind them of the potential climate risks faced by their portfolio companies. Panel B of Table 1 shows that 134 unique funds across 115 unique proposals are affected by the hurricanes. We use the unaffected funds (those located outside the disaster zone and its neighboring counties) that invest in the same (proposal) firm as the control group.

3. Baseline results

In Table 2, we estimate equation (1) with ordinary least squares (OLS) regressions.[12] Looking across the columns in Panel A, the coefficients on hurricane strikes are positive and statistically significant in all specifications. The estimates for this variable are economically meaningful. Based on the test reported column 1, which uses the full sample of 357,649 votes, funds hit by a hurricane are 14 percentage points more likely to vote for a climate-related proposal than are control funds.

[12] We do not use non-linear models, such as probit or logit, because fixed effect estimators in these models can be severely biased (Neyman and Scott, 1948; Greene, 2008).

Column 2 restricts the sample to funds located in a "hurricane county," which we define as a county that has been affected by a hurricane at least once over our sample period. By examining this sub-sample of 3,987 votes, we can alleviate the concern that funds located in hurricane counties are fundamentally different from funds located elsewhere. Our results are mostly unchanged in column 2. The coefficient on hurricane is positive and statistically significant at the 1 percent level. The economic magnitude becomes larger, indicating that affected funds increase their support for an environmental initiative by 38 percent. In column 3, we further restrict the analysis to funds located in hurricane counties that have *never* supported climate proposals. This test generates results similar to those in column 2. Finally, we use the ISS-CRSP matched sample so we can control for fund performance prior to the voting. Column 4 shows that measures of fund performance bear no significant relations to the support for climate proposals. However, salient climate risks induced by experiencing a recent hurricane strike prompt these investors to increase their support for environmental proposals.

With difference-in-difference (DiD) methods, we study changes in voting support for environmental proposals, immediately after a fund experiences a hurricane (the treatment group) against similar voting changes for funds without a recent hurricane episode (the control group). As noted by Bertrand, Duflo, and Mullainathan (2004), the parallel trends assumption must be satisfied to ensure internal validity of DiD models. This assumption requires that in the absence of treatment, the difference between the treatment and control group is constant over time. While testing for ex post counterfactual parallel trends is inheritably infeasible, in Panel B of Table 2, we track the support rates dynamically in the three years before and after the hurricane strike. In this test, we expand the main variable of interest to $Hurricane_{t+n}$, where n ranges between -3 and +3 and indicates the voting dates between 3 years before and 3 years after the hurricane.

For each of the samples we study, Panel B shows that affected shareholders only increase their support in the months immediately *after* the hurricane strike, but not before. This evidence is consistent with the results in Dessaint and Matray (2017) showing that attention to climate risks is temporary. Like these authors, we find that the overreaction horizon is between one and two years following the hurricane (as shown in columns 1 and 4). Interestingly, in columns 2 and 3 of Panel B, we observe that treated funds from hurricane counties reverse their support in the long run (in year $t + 3$), a finding consistent with Chang, Huang, and Wang (2018) that people partially "undo" their overreactions when the attention to climate dissipates. To visualize the temporal patterns underpinning our identification strategy and complement the results in Panel B of Table 2, we plot the coefficients of *Hurricane* (based on the full sample) in Figure 2. Overall, the tests in Panel B of Table 2 and the plot in Figure 2 suggest that our setting satisfies the parallel trends assumption.

3.1. Heterogenous responses

In this section, we explore whether funds' responses to salient climate risks vary depending on firm and investor characteristics.

First, we consider ESG funds versus non-ESG funds. To the extent that ESG fund are more environmentally conscious, their support for environmental issues may be less dependent on the (subjective) salience of a climate event. In the first model of Table 3, we assess this possibility. We run equation (1) by interacting the hurricane shock with the dummy variable, *attribute*, which indicates an ESG fund in column 1.[13] The results show that salience effects are indeed attenuated in ESG shareholders.

[13] We use the taxonomy used by He, Kahraman, and Lowry (2020) to classify ESG funds. According to these authors, ESG funds are those that include one of the following ES-related words in their names: environment, environmentally, climate, green, social, socially, and responsible.

Next, we examine the role of firm ownership by the mutual fund. Iliev and Lowry (2015) argue that a larger stake in the firm provides incentives for fund managers to vote more actively for matters that are in line with their interests. We test this by interacting a fund's ownership with their hurricane experience. In column 2 of Table 3, *attribute* is a continuous variable that represents the percentage of a fund's stake in the firm. We find that voting support for an environmental proposal increases with the (treated) fund's ownership in the firm.

In column 3 of Table 3, we examine whether investors' reactions depend on the degree of pollution. There is considerable debate on whether climate policies are critically important for firms that operate in "brown" industries because these industries face both higher direct and indirect environmental risks (Giglio, Kelly, and Stroebel, 2020). Under this possibility, shareholder engagement may be particularly prominent when the portfolio companies operate in these industries. In column 3, the dummy variable, *attribute*, is set to 1 for firms operating in polluting industries and set to zero otherwise. [14] We interact this dummy variable with *Hurricane*. The results in column 3 suggest that shareholders in these brown firms exhibit an incremental sensitivity to environmental issues when the perceived risks are higher. On average, treated funds are 7 percent more likely to approve a climate-related proposal when their portfolio companies are brown.

Lastly, we explore the effects of geographical distance between the funds in hurricane counties and their portfolio companies. Our test is motivated by Alok, Kumar, and Wermers (2020), who suggest that the salience effect of natural disasters is more pronounced for firms in locations closer to the disaster zone. While we eliminated all firms located in a disaster county, fund managers may

[14] We define highly polluting industries following Hsu, Li, and Tsou (2020). They classify industrial pollution based on firm-level toxic emission intensities. Consistent with the conventional view (Mani and Wheeler, 1997), Petroleum and Natural Gas, Construction, and Chemicals are among the most polluting industries.

(subjectively) perceive climate risks as greater if the firm is closer to a fund's county recently hit by a hurricane. To address this possibility, in column 4 of Table 3 we interact *Hurricane* with the distance (*attribute*) between the fund and the proposal firm. The estimate for this interaction term loads negatively (p-value < 0.05). This result indicates that funds' sensitivity to climate risks decreases when the underlying firm is farther away from the hurricane county.

4. Does shareholder engagement matter?

The key thesis of our paper is that perceptions about climate risks could shape shareholders' voting dynamics. Since shareholder voice is only effective if it influences firm behavior, in this section we evaluate whether the increased shareholder support for environmental proposals affects the voting outcome, and in turn, firm performance.

4.1. Voting outcomes

In Table 4, we study the impact of mutual funds' support on voting outcome (i.e., the proposal's approval during the shareholder meeting).[15] For each climate proposal, we measure shareholder support by calculating the percentage of "for" votes. We use this measure as the dependent variable in columns 1 and 2. In columns 3 and 4, the dependent variable equals one if the proposal passes, and zero otherwise. In all tests, the key independent variable, *share hurricane fund vote "for"*, is the number of votes cast by treated funds in favor of the proposal divided by the number of shares eligible to be voted during the meeting.[16] These tests, which are specified at the proposal level, include ISS vote recommendations and firm characteristics as control variables. These controls are similar to those used in other papers that estimate similar regressions (see, e.g., Iliev and Lowry,

[15] We do not include the proposals whose outcomes are described as "not disclosed" or "not applicable" by ISS.
[16] Because the value of the variable, *share hurricane fund vote "for,"* is small, we multiply the variable by a factor of 10^6 to ease the interpretation of our regression estimates.

2014; Malenko and Shen, 2016). Aside from these control variables, models 2 and 4 of Table 4 include year and industry fixed effects.

Columns 1 and 2 of Table 4 show that the share of treated funds that vote for the proposal is positively associated with the total shareholder support for that proposal. The treatment effect is statistically significant at the 1 percent level. The economic effect is also significant: Based on the second column, an increase of one standard deviation in the share of supportive votes by treated funds is related to an increase in the overall support rate by 7 percent relative to the sample mean.[17]

More importantly, columns 3 and 4 show that the share of treated funds who support the proposal increases the likelihood that the proposal passes. According to the test in column 4, a one standard deviation increase in the share of voting support by treated funds is related to a 1.1 percentage point higher likelihood that the proposal passes.[18] This effect is economically meaningful when benchmarked against the predicted likelihood of passage at its mean value (2.8 percent).

4.2. Climate proposals and firm performance

Numerous papers use ESG, CSR, and other scores to investigate whether corporate initiatives concerning the components captured by these metrics are associated with firm performance. Some studies in this area distinguish among the various score components to isolate their individual effects. Yet, this literature, which mostly focuses on governance and social responsibility issues, delivers mixed evidence probably because scores differ substantially across ratings providers. We

[17] We calculate the change in relative support rate by multiplying the coefficient estimate of *share hurricane fund vote "for"* in column 2 (0.028) by the standard deviation of the same variable (0.4773), to obtain 1.34%. We then divide this magnitude by the sample mean of the dependent variable, *percent of "for" votes*, to obtain 7% relative change.

[18] The calculation is as follows. We multiple the coefficient estimate of *share hurricane fund vote "for"* in column 4 of Table 5 (0.023) by its standard deviation of 0.4773, to obtain 1.1 percent.

circumvent this problem by focusing on the firm value effects of environmental policies using the passing of climate-related proposals during shareholder meetings.

Since the passage of a proposal is endogenous, we instrument it with the percentage of voting support by funds hit by a hurricane immediately before the shareholders' meeting. We argue that the share of "for votes" by hurricane funds is a valid instrumental variable (IV) because it plausibly satisfies both the relevance condition (as shown in Table 4) and the exclusion restriction. The exclusion restriction is likely satisfied because hurricane strikes are exogenous and should not affect the performance of firms located outside hurricane counties, in ways other than through the passage of climate proposals.[19] Nevertheless, we recognize that any inferences drawn from our analysis should be interpreted with caution as only 2.8% of climate-related proposals pass during our sample period (2006–2020). At the same time, the ratified proposals on environmental issues that we study encompass all passed climate proposals recorded by ISS. Therefore, our results still reflect the true effect of environmental proposal on firm value in the existing data.

We first examine the abnormal returns upon the proposal's passage. In the first column of Table 5, we follow Cuñat, Giné, and Guadalupe (2012, 2016) and calculate a firm's abnormal return on the shareholder voting day.[20] We then use a two-stage least squares (2SLS) regression in which the main explanatory variable, *pass*, is instrumented with the share of hurricane funds that vote "for." We note that the *F*-statistic suggests that our instrument is efficient.

The results indicate that the market reaction is 3.7% (p-value < 0.05) lower for firms that pass a climate proposal. This estimate is economically important because, regardless of the outcome,

[19] One concern is that treated funds may affect the (short-term) performance of their portfolio companies through fire sales of the (proposal) firm's shares immediately after the hurricane. This concern does not appear to affect our setting because (1) we also examine long-term firm performance, which is unaffected by fire sales, and (2) we verify in our data that treated funds, on average, do not decrease their ownership in the proposal firms on the meeting date compared to their ownership just prior to the hurricane strike.
[20] Specifically, we use the market model in which the parameters are estimated over a 200-day window before the announcement date of shareholder votes.

the average abnormal return during the voting day of an environmental proposal is 0.07%. In general, the market's reaction upon the passage of a climate proposal suggests that investors do not view these initiatives as value-increasing.

To assess the veracity of the short-term return evidence, we complement it with long-run performance tests. Doing this mitigates the concern that short-term stock reactions may not fully reflect the long-term value of climate proposals. We first estimate a long-term measure, based on a firm's 36-month value-weighted buy-and-hold abnormal return (BHAR) following Barber and Lyon (1997) and Mitchell and Stafford (2000).[21] BHAR is the dependent variable in the regression we report in column 2 of Table 5. In this test, which is otherwise specified as the regression in column 1, the estimate on *Pass* indicates that the approval of a climate proposal is followed by inferior long-run stock performance. Firms that pass a proposal underperform non-passage firms by over 70 percent during the three-year period after the vote.

As Nordhaus (2013) notes, any consideration of meeting climate objectives requires the assessment of present and future costs. Our event-study evidence suggests that investors might view the implementation of a climate-related proposal as too costly, on average. We evaluate this possibility with performance metrics based on accounting data. In column 3 of Table 5, we use return on assets (ROA) in the year following the proposal as the dependent variable. This test is otherwise similar to those reported in the rest of the table. The coefficient estimate indicates accounting underperformance after the passage of environmental proposals. Specifically, ROA declines by 0.27 for firms that approve a climate proposal. This evidence suggests that the lower investor reactions for firms that ratify an environmental proposal might be due, at least in part, to the high cost of these initiatives. To further consider this possibility, in column 4 we use the firm's

[21] Because of the long-term window (3 years after the shareholder meeting) required for calculating the dependent variable, we restrict the sample in this test to proposals voted before 2018.

cost margin in the year following the shareholder voting as the dependent variable. The results show that companies that pass an environmental proposal are indeed associated with significantly higher costs.

In Panel B of Table 5, we assess the robustness of our Panel A findings. The primary concern is that our IV, *share of supportive hurricane funds*, might affect firm performance in ways other than the increased pass rate of an environmental proposal. Although all our sample firms are located outside a hurricane region, it is possible that some firms have supplier/customer links or other material connections to the hurricane counties. Under this possibility, hurricane-related damages to these suppliers/customers may adversely affect firm value. Unfortunately, supply chain or other links to the hurricane area are not directly observable. Nevertheless, to identify firms that may experience potentially detrimental effects due to ties to the hurricane regions, we estimate firms' abnormal stock reactions to the hurricanes around the strike date.[22] If a material link to the hurricane area exists, investors should price any related damage from a strike. Thus, to mitigate the impact of firms' links to the hurricane area, we drop observations with abnormal returns in the bottom 1 percentile (i.e., most negative) around the hurricane landfall. The results in Panel B, which consider the remaining firms, continue to show weaker performance for firms that pass a climate-related proposal.

5. Robustness tests

In this section, we describe several tests which we perform to assess the robustness of our results.

5.1. Support for non-environmental proposals

[22] Specifically, following standard event-study methods, we use the market model to estimate a firm's cumulative abnormal stock reaction to the hurricane around [-1,+1] of the hurricane landfall, where day 0 is the landfall date.

We are sensitive to the possibility that hurricane experience may capture unobserved fund characteristics that alter these funds' *general support* for issues in corporate proxy statements. To address this issue, we create four samples of placebo voted items unrelated to climate risks, such as corporate governance questions about the board of directors, say-on-pay, M&A matters, and auditing issues. In Panel A of Table 6, we run four regressions (based on equation (1)) using these placebo items as the respective dependent variables. In contrast to climate proposals, we find that hurricane strikes have no significant impact on the support these unrelated issues receive. These findings are consistent with the view that hurricane strikes only alter shareholders' support for climate-related issues.

5.2. Alternative proxies

We address the concern that hurricane exposure may capture unobserved fund attributes in a different way. Specifically, we perform three additional tests using alternative definitions of treated and control groups. First, we drop all observations in which a fund is located in a disaster zone (i.e., counties *directly* hit by a hurricane). Therefore, our treated group consists only of funds in counties adjacent to a disaster zone. Because these funds nearly miss the hurricane, their fundamentals are unlikely to be affected. However, due to geographical proximity, climate risks remain salient (Dessaint and Matray, 2017). In the first column of Panel B of Table 6, we run our baseline regression using this new treated group. Our results prove robust to this alternative classification.

In column 2 of Panel B, we refine our control group. Specifically, we restrict the control group to funds outside a hurricane region that directly neighbor a hurricane region. In other words, we focus on the subsample of 12,355 observations where the treated and control funds are neighboring each other. This setting alleviates the concern that funds located in a hurricane region are systematically different from the funds located elsewhere. We continue to observe a significant reaction to the climate proposals using this alternative control group.

In column 3 of Panel B, we combine the two procedures used in columns 1 and 2 so that, with this strictest definition, the treated funds are those adjacent to a disaster zone (but not directly hit by a hurricane) and the control funds are directly neighboring a treated county (but not located in a hurricane county). Our baseline result, that shareholders' support for climate proposals increases after exposure to a hurricane strike, also obtains using this stringent taxonomy to define both treated and control groups.

5.3. Alternative environmental disaster: wildfires

We validate our experiment by examining another type of environmental disaster: wildfires. Unlike hurricane landfalls, wildfires are much more frequent in the United States. According to the National Interagency Fire Center, on average, 69,302 fires occur annually over our sample period. As a result, wildfire episodes may be less salient than hurricanes. We therefore focus on the shareholder voting in the month following a wildfire event in their headquarter county. Data on wildfire date and location come from the National Oceanic and Atmospheric Administration.[23] As in our main tests, we eliminate firms that are directly headquartered in a fire county. We then run two regressions based on equation (1) using *wildfire*, an indicator variable for a recent (i.e., within-a-month) fire event in the fund's county, as the key independent variable.

Panel C of Table 6 reports the results. Like hurricanes, wildfires prompt shareholders to significantly increase their support for a climate proposal. According to column 1, in our full sample, funds are 1.2 percent more likely to vote in favor of a climate proposal right after a wildfire experience. Meanwhile in the ISS-CRSP matched subsample test (column 2), which controls for

[23] Data on economic damage are not available for wildfires. Therefore, we include all fire events in our analysis.

fund characteristics, the likelihood of support increases by 2.6 percent. While the voting effect of wildfires is smaller than the effect of hurricanes, wildfires are still salient enough to alter shareholders' support for climate-related proposals.

5.4. Are the results driven by fund / firms' changed fundamentals?

Because we deliberately eliminate all firms located in a disaster region, changed (fund or firm) fundamentals after a hurricane strike are unlikely to be driving our results. Nevertheless, we perform two additional analyses to further examine this issue. We begin by removing funds with large outflows following a hurricane. The reasoning here is that large outflows could indicate that the hurricane distorted the fund's operations even if it did not physically damage the fund. In the regressions reported in the first two columns of Panel D of Table 6, we drop treated funds whose outflows are respectively above the 10^{th} or 25^{th} percentile among all treated funds in the month after the hurricane landfall. According to the results of these analyses, which are based on equation (1), discarding these funds does not alter our baseline findings.

Next, we eliminate firms located in counties adjacent to a hurricane disaster zone. The rationale for this exclusion is that firms in adjacent counties may still be affected by a hurricane due to their proximity to the disaster area (Dessaint and Matray, 2017). Therefore, this exclusion ensures that all remaining firms submitting an environmental proposal are considerably distant from a hurricane county. In Panel D of Table 6, the regression results in columns 3 and 4 deliver additional evidence in favor of the thesis that exposure to salient climatic events, and not firm's fundamentals, bolsters shareholders' support for environmental proposals.

5.5. Large versus moderate hurricanes

In a similar experimental setting, Dessaint and Matray (2017) examine the effect of hurricanes on managers' cash holding decision. They define major hurricane strikes as those that cause a total direct damage above $5 billion. To compare the effect of larger versus smaller disasters, we conduct two additional tests. In the first column of Panel E, we follow Dessaint and Matray (2017) to discard hurricanes that cause a total damage below $5 billion (which we call *moderate hurricanes*). We find that our conclusions are unaffected if we only use larger hurricane events. In column 2, we split our main independent variable into *Large* and *Moderate Hurricanes*. The specification is otherwise similar to that in the first column. In this test, both coefficients are statistically significant at the 1 percent level. The economic magnitude of large hurricanes is slightly larger than that of moderate hurricanes. This evidence shows that both moderate and large hurricane strikes generate shareholder reactions to climate risks.

6. Conclusion

We empirically study the association between shareholders' beliefs about climate risk and their support for environmental proposals. We also consider whether these proposals affect firm value. Our results indicate that funds in areas hit by a hurricane are significantly more likely to vote in favor of a climate-related environmental proposal immediately after the strike. Because the unconditional support rates for environmental proposals do not vary with fund location, our findings are likely due to investors' changed perceptions about salient climate risks. Other tests show that (a) the voting patterns by funds with greater knowledge towards climate issues are less reliant on salient cognitive factors such as recent exposure to a hurricane, (b) the overreaction to perceived climate risks increases with the fund's ownership in the firm, and (c) the extrapolation of the value of an environmental proposal is more acute for firms in high pollution sectors. Collectively, these results underscore the role of behavioral phenomena in shaping shareholders' beliefs about climate risks and, in turn, their endorsement of corporate environmental policies.

Our last set of tests, in which we instrument the passage of a climate proposal with the share of support by funds in areas recently hit by hurricanes, shows that investor reactions on the voting date are 5.6% lower for firms that approve a climate proposal. We also find that companies that pass environmental proposals earn lower long-term stock and accounting returns.

Our findings should be of interest to regulators, academics, investors, and other groups debating the role of corporations in environmental protection. While our tests indicate that climate-related initiatives by corporations harm shareholder wealth, we do not assess the impact of these initiatives on the welfare of society at large. We hope that our work motivates other researchers to explore this important piece of the puzzle.

References

Addoum, J., Ng D., Ortiz-Bobea A., 2020. Temperature shocks and establishment sales. Review of Financial Studies 33, 1331-1366.

Albuquerque, R., Koskinen Y., Yang S., Zhang C., 2020. Resiliency of environmental and social stocks: An analysis of the exogenous COVID-19 market crash. Review of Corporate Finance Studies 9, 593-621.

Alok, S., Kumar N., and Wermers R., 2020. Do fund managers misestimate climatic disaster risk. Review of Financial Studies 33, 1146-1183.

Andonov, A., Rauh, J.D., 2020. The return expectations of institutional investors. Stanford University Graduate School of Business Research Paper No. 18-5.

Barber, B. M., Lyon J. D., 1997. Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. Journal of Financial Economics 43, 341-372.

Berg, F., Kölbel, J., Rigobon, R., 2020. Aggregate confusion: The divergence of ESG ratings. Available at SSRN: https://ssrn.com/abstract=3438533.

Bernile, G., Bhagwat V., Kecskes A., Nguyen P.-A., 2020. Are the risk attitudes of professional investors affected by personal catastrophic experiences? Financial Management, *forthcoming.*

Bordalo, P., Gennaioli N., Shleifer A., 2012. Salience theory of choice under risk. Quarterly Journal of Economics 127, 1243-1285.

Bordalo, P., Gennaioli N., Shleifer A., 2013. Salience and consumer choice. Journal of Political Economy 121, 803-843.

Bolton, P., Kacperczyk M., 2020. Do investors care about carbon risk? National Bureau of Economic Research.

Calluzzo, P., Kedia S., 2019. Mutual fund board connections and proxy voting. Journal of Financial Economics 134, 669-688.

Chang, T., Huang W., and Wang Y., 2018. Something in the air: Pollution and the demand for health insurance. Review of Economic Studies 85,1609-34.

Chatterji, A.K., Durand, R., Levine, D.I., Touboul, S., 2016. Do ratings of firms converge? Implications for managers, investors and strategy researchers. Strategic Management Journal 37, 1597-1614.

Chava, S., 2014. Environmental externalities and cost of capital. Management Science 60, 2223-47.

Choi, D., Gao Z., Jiang W., 2020. Attention to global warming. Review of Financial Studies 33, 1112-1145.

Cuñat V., Giné M., Guadalupe M., 2012. The vote is cast: The effect of corporate governance on shareholder value. Journal of Finance 67, 1943-1977.

Cuñat V., Giné M., Guadalupe M., 2016. Say pays! Shareholder voice and firm performance. Review of Finance 20, 1799-1834.

Dessaint, O., and Matray A., 2017. Do managers overreact to salient risks? Evidence from hurricane strikes. Journal of Financial Economics 126, 97-121.

El Ghoul, S., Guedhami O., Kim H., Park K., 2018. Corporate environmental responsibility and the cost of capital: International evidence. Journal of Business Ethics 149, 335-61.

Elsner, J., Bossak, B., 2001. Bayesian analysis of U.S. hurricane climate. Journal of Climate 14, 4341-4350.

Engle, RF, Giglio S, Kelly B., Lee H., Stroebel J., 2020. Hedging climate change news. Review of Financial Studies 33, 1184-1216.

Fisher-Vanden, K., Thorburn K., 2011. Voluntary corporate environmental initiatives and shareholder wealth. Journal of Environmental Economics and Management 62, 430-445.

Flammer, C., 2015. Does corporate social responsibility lead to superior financial performance? A regression discontinuity approach. Management Science 61, 2549-2568.

Franzoni, F., and Schmalz M. C., 2017. Fund flows and market states. Review of Financial Studies 30, 2621-2673.

Giglio, S., Kelly B., Stroebel J., 2020. Climate finance. NBER working paper.

Giglio, S., Maggiori M., Stroebel J., Weber A., 2020. Climate change and long-run discount rates: Evidence from real estate. National Bureau of Economic Research.

Gillan, S.L., Koch A., Starks L.T., 2021. Firms and social responsibility: A review of ESG and CSR research in corporate finance. Journal of Corporate Finance 66, 101889.

Goetzmann, W. N., Kim D., Kumar A., Wang Q., 2014. Weather-induced mood, institutional investors, and stock returns. Review of Financial Studies 28, 73-111.

Greene, W. H., 2008. The behavior of the fixed effects estimator in nonlinear models. NYU Working Paper No. EC-02-05.

Grewal, J., Serafeim G., Yoon A., 2016. "Shareholder Activism on Sustainability Issues. Harvard Business School Working Paper, No. 17-003.

He, Y. E., Kahraman B., Lowry M., 2020. ES risks and shareholder voice. Working paper.

Hirshleifer, D., 2001. Investor psychology and asset pricing. Journal of Finance 56, 493-494.

Hoepner, A.G., Oikonomou I., Sautner Z., Starks L.T., Zhou X., 2021. ESG shareholder engagement and downside risk. Working paper.

Hong, H, Li FW, Xu J. 2019. Climate risks and market efficiency. Journal of Econometrics 208, 265-281.

Hsu, PH., Li K., Tsou CY., 2020. The pollution premium. Available at SSRN 3578215.

Iliev, P., Lowry, M., 2015. Are mutual funds active voters? Review of Financial Studies 28, 446-485.

Kaplanski, G., Levy H., 2010. Sentiment and stock prices: The case of aviation disasters. Journal of Financial Economics 95, 174-201.

Krueger, P., Sautner Z., Starks LT., 2020. The importance of climate risks for institutional investors. Review of Financial Studies 33, 1067-1111.

Matvos, G., Ostrovsky, M., 2010. Heterogeneity and peer effects in mutual fund proxy voting. Journal of Financial Economics 98, 90-112.

Malenko, N, Shen Y., 2016. The role of proxy advisory firms: Evidence from a regression-discontinuity design. Review of Financial Studies 29, 3394–3427.

Mani, M., Wheeler D., 1997. In search of pollution heavens? Dirty industry in the world economy, 1960-1995. OECD Conference on FDI and the Environment.

McCahery, Sautner, Z., Starks, L., 2016. Behind the scenes: the corporate governance preferences of institutional investors. Journal of Finance 71, 2905-2932.

Mitchell, M., Stafford, E., 2000. Managerial decisions and long-term stock price performance. Journal of Business 73, 287-329.

Murfin, J., Spiegel., M., 2020. Is the risk of sea level rise capitalized in residential real estate? Review of Financial Studies 33, 1217-1255.

Neyman J., Scott, E., 1948. Consistent estimates based on partially consistent observations. Econometrica16, 1-32.

Nordhaus, W. D., 2013. The Climate casino: Risk, uncertainty, and economics for a warming world. Yale University Press.

Pielke, R., Landsea C., Mayfield M., Laver J. Pasch R., 2005. Hurricanes and global warming. Bulletin of the American Meteorological Society 86, 1571-1575.

Pielke, R., Gratz J., Landsea C. W., Collins D., Saunders M. A., Musulin R., 2008. Normalized hurricane damage in the United States: 1900-2005. Natural Hazards Review 9, 29-42.

Ramirez, A., N. Altay., 2011. Risk and the multinational corporation revisited: The case of natural disasters and corporate cash holdings. Working Paper.

Sautner, Z., van Lent L., Vilkov G., Zhang R., 2020. Firm-level climate change exposure. ECGI Working Paper N° 686.

Sharfman, M., Fernando C., 2008. Environmental risk management and the cost of capital, Strategic Management Journal 29, 569-92.

Shive, S., Yun H., 2013. Are mutual funds sitting ducks? Journal of Financial Economics 107, 220-237.

Starks, L.T., Venkat, P., Zhu, Q., 2017. Corporate ESG profiles and investor horizons. Available at SSRN 3049943.

Vincenty, T., 1975. Direct and inverse solutions of geodesics on the ellipsoid with application of nested equations. Survey Review XXIII, 88-93.

Figure 1. Climate Proposals and Shareholder Support

The figure plots the share of environmental proposals (scaled by all shareholder proposals) and the percentage of investors who vote "for" to support environmental proposals. The sample includes all firms from the ISS Voting Analytics from 2006 to 2020.

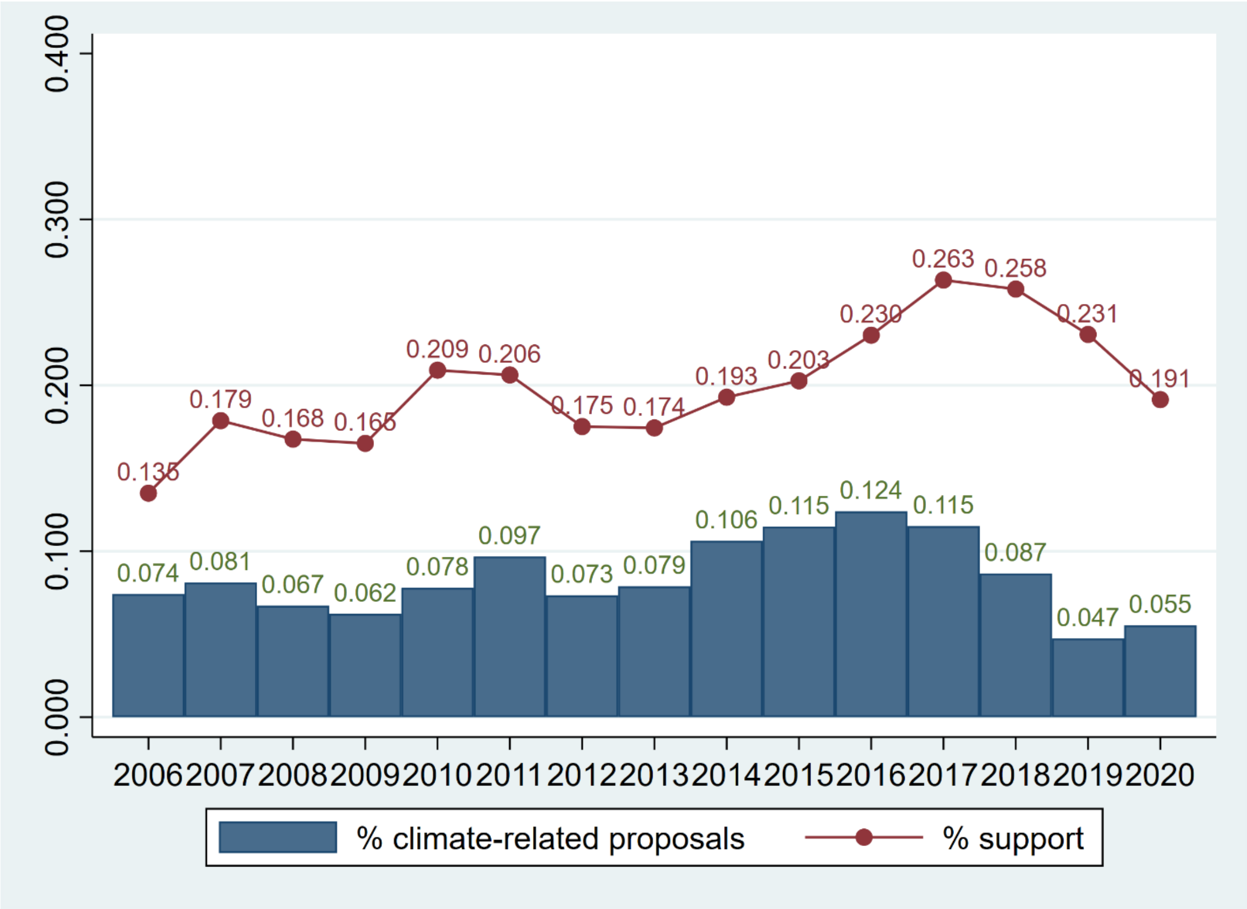

Figure 2. Parallel Trend of Support around Hurricanes

The figure plots the coefficients of "hurricane" in equation (1) around the hurricane year. Solid lines indicate 95% confidence intervals.

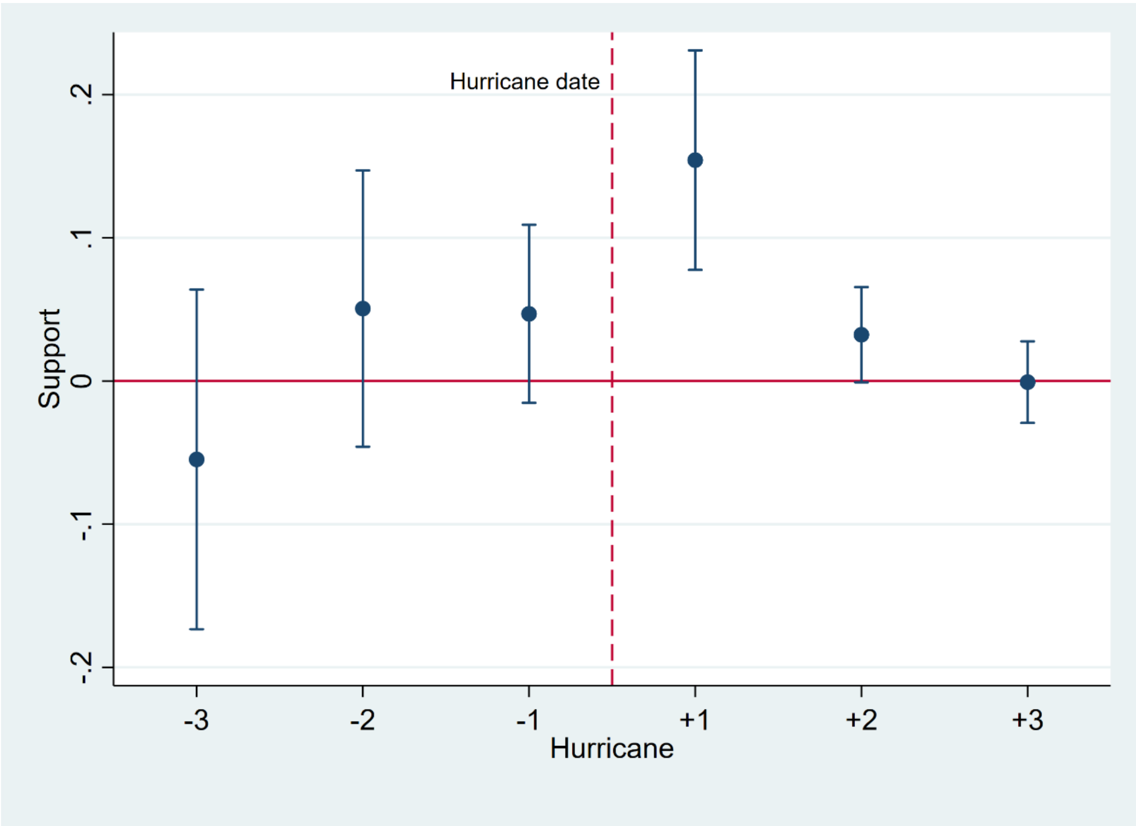

Table 1. Descriptive Statistics

Summary statistics of the variables (Panel A) and the description of hurricane strikes used in our analysis (Panel B). Definitions of all variables appear in the Appendix. The sample is from 2006 to 2020. Information about the hurricanes comes from United States National Oceanic and Atmospheric Administration's National Weather Service. Estimated data about hurricanes in 2020 are preliminary.

Panel A. Climate-related proposals and votes

	N	Mean	S.D.	25th	50th	75th
Vote-level statistics: unique votes = 357,649						
Vote "for"	357,649	0.2551	0.4359	0	0	1
ES fund	357,649	0.0108	0.1032	0	0	0
Distance (miles)	357,649	1185.29	788.36	559.69	1054.33	1616.31
Polluting industry	357,649	0.3177	0.4656	0	0	1
TNA (in log)	131,347	5.8641	2.2969	4.3858	5.9465	7.4039
Return	131,347	0.0134	0.0298	0	0.0081	0.0255
Expense ratio	131,347	0.0066	0.0052	0.0020	0.0065	0.0102
Turnover	131,347	0.6085	0.7418	0.1400	0.3900	0.8000
Flow	131,347	0.0106	0.0967	-0.0115	-0.0001	0.0186
Proposal- and firm-year-level statistics: unique proposals = 716						
Percent of "for" votes	716	0.2022	0.1493	0.0692	0.2117	0.3070
ISS recommendation "for"	716	0.6285	0.4835	0	1	1
Share hurricane fund vote "for"	716	0.0722	0.4773	0	0	0
Pass	716	0.0279	0.1649	0	0	0
Firm size (in log)	716	10.1348	1.5914	8.9603	10.3206	11.2136
ROA	716	0.0527	0.0753	0.0205	0.0504	0.0886
Asset tangibility	716	0.4304	0.2713	0.1540	0.4993	0.6641
Leverage	716	0.3069	0.2193	0.1695	0.3052	0.4199
Cash	716	0.0935	0.1086	0.0157	0.0553	0.1403
Market-to-book	716	1.9309	1.0823	1.2299	1.5816	2.2458
Abnormal return	699	0.0007	0.0228	-0.0071	-0.0004	0.0063
Post proposal ROE	670	0.1163	0.2692	0.0515	0.1264	0.1989
Cost margin	670	0.7731	0.1645	0.6657	0.7966	0.8710

(*Table continued next page*)

Panel B. Hurricanes

Hurricane	Start date	End date	Direct deaths	Damage (in 2010 dollars)	Category
Dennis	07.04.2005	07.13.2005	3	>2 billion	4
Katrina	08.23.2005	08.30.2005	>1,500	>120 billion	3
Ophelia	09.06.2005	09.17.2005	1	>77 million	1
Rita	09.18.2005	09.26.2005	7	>13 billion	3
Wilma	10.15.2005	10.25.2005	5	>23 billion	3
Humberto	09.12.2007	09.14.2007	1	>52 million	1
Dolly	07.20.2008	07.25.2008	1	>1 billion	1
Gustav	08.25.2008	09.07.2008	11	>4 billion	2
Ike	09.01.2008	09.14.2008	20	>29 billion	2
Irene	08.21.2011	08.28.2011	40	>15 billion	3
Isaac	08.21.2012	09.01.2012	5	>2 billion	1
Hermine	08.28.2016	09.03.2016	1	>500 million	1
Matthew	09.28.2016	10.10.2016	34	>9 billion	5
Harvey	08.17.2017	09.01.2017	68	>110 billion	4
Irma	08.30.2017	09.12.2017	10	>44 billion	5
Nate	10.04.2017	10.08.2017	0	>200 million	1
Florence	08.31.2018	09.17.2018	22	>20 billion	4
Michael	10.07.2018	10.11.2018	16	>21 billion	5
Laura	08.27.2020	08.28.2020	42	>15 billion	4
Zeta	10.24.2020	10.29.2020	5	>3 billion	3

Number of unique funds affected: 134
Number of unique proposals affected: 115

Table 2. Hurricanes and Shareholder Support for Environmental Proposals

OLS regressions. The dependent variable is "vote for," an indicator variable that equals one if a fund votes for the proposal. The sample includes proposals on environmental issues from 2006-2020. Panel A presents the baseline regressions. "Hurricane" is a dummy variable that equals one if the mutual fund's county is affected by a big hurricane (i.e., total damage >500 million due to the disaster) within 12 months prior to the shareholders' meeting. Panel B presents the dynamic effects from three years before (t – 3) until three years after (t + 3) the hurricane strike. The variable *distance* is divided by 1,000 to facilitate the interpretation. Standard errors are clustered by fund and by year-quarter. We include proposal fixed effects and fund fixed effects in all regressions. Constant terms are not reported for brevity.

Panel A. Baseline regressions

	Full ISS sample	Funds in hurricane counties	Funds that never supported before	ISS-CRSP matched sample
	1	2	3	4
Hurricane	0.140***	0.384***	0.389***	0.122**
	(0.041)	(0.031)	(0.032)	(0.052)
Distance	0.003	-0.028	-0.026	0.004
	(0.003)	(0.052)	(0.051)	(0.004)
TNA				0.001
				(0.003)
Expense ratio				-0.503
				(1.290)
Turnover				-0.001
				(0.009)
Return				-0.011
				(0.071)
Flow				-0.015
				(0.020)
Fixed effects	Proposal, Fund	Proposal, Fund	Proposal, Fund	Proposal, Fund
Observations	357,649	3,987	3,825	131,347
R^2	0.555	0.768	0.768	0.570

(*Table continued next page*)

Panel B. Leads and lags

	Full ISS sample	Funds in hurricane counties	Funds that never supported before	ISS-CRSP matched sample
	1	2	3	4
Hurricane_{t-3}	-0.055	-0.008	-0.009	-0.145
	(0.059)	(0.037)	(0.037)	(0.087)
Hurricane_{t-2}	0.051	0.000	0.000	0.105
	(0.048)	(0.000)	(0.000)	(0.064)
Hurricane_{t-1}	0.047	-0.004	-0.006	0.031
	(0.031)	(0.043)	(0.044)	(0.052)
Hurricane_{t+1}	0.154***	0.366***	0.370***	0.214***
	(0.038)	(0.041)	(0.041)	(0.038)
Hurricane_{t+2}	0.032*	0.000	0.000	0.046***
	(0.017)	(0.000)	(0.000)	(0.015)
Hurricane_{t+3}	-0.001	-0.191***	-0.191***	-0.012
	(0.014)	(0.069)	(0.069)	(0.013)
Distance	0.003	0.017	0.020	0.004
	(0.003)	(0.082)	(0.081)	(0.004)
TNA				0.001
				(0.003)
Expense ratio				-0.512
				(1.295)
Turnover				-0.001
				(0.009)
Return				-0.004
				(0.072)
Flow				-0.015
				(0.021)
Fixed effects	Proposal, Fund	Proposal, Fund	Proposal, Fund	Proposal, Fund
Observations	357,649	3,987	3,825	131,347
R^2	0.555	0.768	0.769	0.570

Table 3. Heterogenous Responses

This table explores the heterogeneous responses to environmental proposals following hurricanes. We use OLS regressions. The dependent variable is "vote for," an indicator variable that equals one if a fund votes for the proposal. "Hurricane" is a dummy variable that equals one if the mutual fund's county is affected by a hurricane within 12 months prior to the vote. We interact the variable "Attribute" with Hurricane as follows. In column 1, "Attribute" is an indicator variable for ESG funds; in column 2, "Attribute" is the ownership (in %) of the fund in the portfolio company; in column 3, "Attribute" is a dummy variable that equals one if the firm is operating in a high pollution industry, and zero otherwise; in column 4, "Attribute" is the geographical distance between the fund and the portfolio company. Standard errors are clustered by fund and by year-quarter. The variable *distance* is divided by 1,000 to facilitate the interpretation. We include proposal and fund fixed effects in all regressions.

	Attribute =			
	ESG fund	Ownership	High pollution firm	Distance
	1	2	3	4
Attribute × Hurricane	-0.427***	1.038**	0.068**	-0.050**
	(0.078)	(0.410)	(0.029)	(0.021)
Hurricane	0.159***	0.054	0.111**	0.187***
	(0.043)	(0.040)	(0.046)	(0.049)
Attribute		-0.029***		
		(0.010)		
Distance	0.003	0.005	0.003	0.003
	(0.003)	(0.004)	(0.003)	(0.003)
Fixed effects	Proposal, Fund	Proposal, Fund	Proposal, Fund	Proposal, Fund
Joint significance of	0.154***	0.097**	0.133***	0.128***
hurricane: $\partial f()/\partial Hurricane$	(0.043)	(0.040)	(0.041)	(0.039)
Observations	357,649	108,377	357,649	357,649
R^2	0.555	0.572	0.555	0.555

Table 4. Support and Passage of Climate Proposals

OLS regressions. In columns 1 and 2, the dependent variable is the percentage of support ("for" votes) at the proposal level. In columns 3 and 4, the dependent variable equals one if the proposal is passed, and zero otherwise. The sample includes only climate-related proposals from 2006 to 2020. *Share hurricane fund vote "for"* measures the percentage of funds hit by a hurricane that vote for the proposal, scaled by the total number of voting shares. This variable is multiplied by 10^6 to ease the interpretation. Standard errors are clustered by firm and by quarter. In even-numbered columns, we control for year and industry (Fama-French 49 industries) fixed effects.

	Percent of "for" votes		Pass	
	1	2	3	4
Share hurricane fund vote "for"	0.023***	0.028***	0.013***	0.023**
	(0.001)	(0.004)	(0.001)	(0.006)
ISS recommendation "for"	0.216***	0.208***	0.034**	0.036**
	(0.003)	(0.005)	(0.011)	(0.010)
Firm size	-0.007*	-0.011**	-0.010**	-0.018**
	(0.003)	(0.003)	(0.002)	(0.004)
ROA	0.147**	0.107*	0.115***	0.100**
	(0.041)	(0.038)	(0.014)	(0.030)
Asset tangibility	0.015	0.009	0.027*	-0.010
	(0.010)	(0.018)	(0.011)	(0.028)
Leverage	-0.021	-0.014	-0.043***	-0.056**
	(0.010)	(0.019)	(0.007)	(0.014)
Cash	-0.087	-0.062*	-0.067**	-0.106*
	(0.060)	(0.022)	(0.018)	(0.038)
Market-to-book	-0.008*	-0.008**	-0.004	-0.013*
	(0.003)	(0.002)	(0.002)	(0.004)
Fixed effects	No	Year, Industry	No	Year, Industry
Observations	716	716	716	716
R^2	0.528	0.632	0.029	0.171

Table 5. Passage of Climate Proposals and Firm Performance

The table reports the results of the second stage of two-stage least squares (2SLS) regressions. The main independent variable is *Pass*, an indicator variable that equals one if the proposal is passed, and zero otherwise. We instrument *Pass* with the share of treated funds that vote for the proposal. The results of the first stage are reported in Table 4. Panel B excludes firms with negative (bottom 1 percentile) return reactions on the hurricane date. Standard errors are clustered by firm and by quarter. We include year and Fama-French 49 industry fixed effects.

Panel A. All sample firms

	Abnormal return	BHAR 36 months	Post-proposal ROA	Post-proposal cost margin
	1	2	3	4
Pass (instrumented by *share hurricane fund vote "for"*)	-0.037**	-0.719*	-0.269***	0.417**
	(0.007)	(0.234)	(0.037)	(0.109)
ISS recommendation "for"	0.003**	-0.044*	0.006*	-0.032***
	(0.001)	(0.018)	(0.002)	(0.006)
Firm size	-0.001	0.008	0.001	0.001
	(0.001)	(0.012)	(0.001)	(0.002)
ROA	0.044**	0.167	0.414***	-0.296***
	(0.014)	(0.145)	(0.013)	(0.023)
Asset tangibility	0.002	-0.428***	-0.012	-0.109
	(0.004)	(0.060)	(0.010)	(0.049)
Leverage	-0.002	-0.241**	0.005	-0.074**
	(0.002)	(0.065)	(0.002)	(0.023)
Cash	-0.025	0.084	0.033*	0.073
	(0.013)	(0.178)	(0.013)	(0.040)
Market-to-book	-0.004**	-0.013	0.013***	-0.004
	(0.001)	(0.016)	(0.001)	(0.006)
Fixed effects	Year, Industry	Year, Industry	Year, Industry	Year, Industry
Observations	692	585	664	655
R^2	0.140	0.292	0.563	0.464
F-statistic	15.28	148.78	296.52	408.62

Panel B. Excluding firms with negative return reactions to hurricanes

	Abnormal return	BHAR 36 months	Post-proposal ROA	Post-proposal cost margin
	1	2	3	4
Pass (instrumented)	-0.044**	-1.742***	-0.091*	0.243*
	(0.010)	(0.145)	(0.032)	(0.102)
Controls as in Panel A	Yes	Yes	Yes	Yes
Fixed effects	Year, Industry	Year, Industry	Year, Industry	Year, Industry
Observations	684	577	656	647
R^2	0.139	0.278	0.564	0.464
F-statistic	17.24	99.50	205.34	216.31

Table 6. Robustness Tests

Robustness tests for the results in Table 2. The dependent variable is "vote for," an indicator variable that equals one if a fund votes for the proposal. Panel A uses placebo proposals to replace environmental proposals. Panel B uses alternative definitions of treated and control groups. Panel C examines the effect of wildfires in the fund's county. Panel D excludes treated funds with extreme outflows after the hurricane or firms located in adjacent counties to a disaster zone. Panel E examines the effect of large versus moderate hurricanes separately. Standard errors are clustered by fund and by quarter. We include proposal fixed effects and fund fixed effects in all regressions.

Panel A. Placebo votes

	Board-related	Say-on-pay issues	Takeover-related	Auditing issues
	1	2	3	4
Hurricane	0.000	0.0004	-0.017	0.001
	(0.031)	(0.001)	(0.023)	(0.006)
Fixed effects	Proposal, Fund	Proposal, Fund	Proposal, Fund	Proposal, Fund
Observations	475,580	574,538	36,432	2,988,998
R^2	0.633	0.495	0.583	0.464

Panel B. Alternative definitions of treated and control groups

	Treated group excluding disaster zones	Control group using direct neighboring counties only	Treated group excl. disaster zones *and* control group using neighboring counties
	1	2	3
Hurricane	0.129***	0.109***	0.152***
	(0.038)	(0.029)	(0.038)
Fixed effects	Proposal, Fund	Proposal, Fund	Proposal, Fund
Control distance	Yes	Yes	Yes
Observations	357,108	12,355	11,814
R^2	0.555	0.659	0.661

(*Table continued next page*)

Panel C. Wildfires

	All wildfires	ISS-CRSP matched sample
	1	2
Wildfire	0.012*	0.026**
	(0.006)	(0.010)
Fixed effects	Proposal, Fund	Proposal, Fund
Control distance	Yes	Yes
Fund controls	No	Yes
Observations	234,160	85,477
R^2	0.560	0.573

Panel D. Excluding funds / firms whose operations might be affected

	Exclude funds with large outflows after hurricanes (ISS-CRSP sample)		Exclude firms in counties adjacent to disaster zones	
	Excl. top 10 pct outflows	Excl. top 25 pct outflows	Full sample	ISS-CRSP
	1	2	3	4
Hurricane	0.107**	0.075*	0.135***	0.117**
	(0.050)	(0.041)	(0.041)	(0.053)
Fixed effects	Proposal, Fund	Proposal, Fund	Proposal, Fund	Proposal, Fund
Control distance	Yes	Yes	Yes	Yes
Fund controls	Yes	Yes	No	Yes
Observations	131,330	131,283	354,890	130,260
R^2	0.570	0.579	0.556	0.570

Panel E. Large vs. moderate hurricanes

	1	2
Large hurricane (dmg > $5b)	0.134**	0.141***
	(0.054)	(0.050)
Moderate hurricane ($50m < dmg < $5b)		0.139***
		(0.034)
Fixed effects	Proposal, Fund	Proposal, Fund
Control distance	Yes	Yes
Observations	357,202	357,649
R^2	0.556	0.556

Appendix. Variable Definition

Variable	Definition
Fund and vote-level variables:	
Vote "for"	Indicator variable equals 1 if the fund votes for the proposal, 0 otherwise. (Source: ISS)
Hurricane	Indicator variable equals 1 if the fund is in a county hit by a hurricane strike in the 12 months before the shareholder meeting or in a directly neighboring county, 0 otherwise. (Source: National Centers for Environmental Information)
ES fund	Indicator variable equals 1 if the fund is an ESG fund, 0 otherwise. (Source: ISS)
Distance	Geographical distance between the fund and the firm calculated with Vincenty's (1975) formula.
TNA (in log)	Total net asset of mutual fund by the end of the month before the shareholder meeting. (Source: CRSP Mutual Fund)
Return	The monthly fund raw return with monthly expenses added back. Fund-level return is a weighted average of share-class returns using share-class TNA as weight. (Source: CRSP Mutual Fund)
Expense ratio	Annual total expense ratio at the fund level using share-class TNA as weight. (Source: CRSP Mutual Fund)
Turnover	Fund turnover defined as the minimum (of aggregated sales or aggregated purchases of securities), divided by the average 12-month TNA of the fund. (Source: CRSP Mutual Fund)
Flow	Fund flow defined as $[TNA_{i,t} – TNA_{i,t–1} \times (1 + R_{i,t})] / TNA_{i,t–1}$, where $R_{i,t}$ is fund return in month t. (Source: CRSP Mutual Fund)
Ownership	Percentage of shares owned in the portfolio firm. (Source: CRSP Mutual Fund)
Wildfire	Indicator variable equals 1 if the fund is in a county hit by a wildfire in the month before the shareholder meeting, 0 otherwise. (Source: National Oceanic and Atmospheric Administration)
Firm and proposal-level variables:	
Percent of "for" votes	Percentage of "for" votes by proposal. (Source: ISS)
ISS recommendation "for"	Indicator variable equals 1 if ISS recommends "for," 0 otherwise. (Source: ISS)
Share hurricane fund vote "for"	Share of treated mutual funds that vote for the proposal. (Source: ISS)
Pass	Indicator variable equals 1 if the proposal passes, 0 otherwise. (Source: ISS)
Firm size	Logarithm of total assets. (Source: Compustat)
ROA	Return on assets calculated as net income (loss) divided by total assets. (Source: Compustat)

ROE	Return on equity calculated as net income (loss) divided by book value of equity. (Source: Compustat)
Cost margin	Total costs (Sales – Earnings Before Interest, Taxes, Depreciation, and Amortization) scaled by sales. (Source: Compustat)
Asset tangibility	The ratio of property plant and equipment to total assets. (Source: Compustat)
Leverage	The ratio of book value of debt to total assets. (Source: Compustat)
Cash	The ratio of cash holding to total assets. (Source: Compustat)
Market-to-book	The market value of the firm to its book value. (Source: Compustat)
Polluting industry	Indicator variable equals 1 if the firm is operating in the top three polluting industries (i.e., Petroleum and Natural Gas, Construction, and Chemicals) based on Hsu, Li, and Tsou (2020), 0 otherwise. (Source: Compustat)
Abnormal return	Abnormal return on the voting date estimated with the market model. (Source: CRSP)
BHAR	Buy-and-hold abnormal return calculated over the 36-month window following the proposal date. (Source: CRSP)