Disaster Relief, Inc.

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Abstract – A long-standing question in economics is why companies donate to charity beyond the potential tax benefits. We investigate the motivations and value implications of corporate philanthropy in a global sample of firms providing relief to disaster-affected communities. We exploit disaster-specific factors in an event-study setting around donation announcements to show that although, on average, donating decreases returns, the strategic benefits of donating around salient, attention-grabbing disasters mitigate this negative effect. To account for the decision to donate, we rely on exogenous variation in the availability of corporate charitable funds due to the timing of the disaster relative to firms' financial year. We show that donations can enhance returns by increasing customer awareness, firm reputation, sales, and stakeholder support. Our findings highlight the conditions under which the strategic benefits of corporate philanthropy outweigh its agency costs.

Keywords: Natural disasters, corporate philanthropy, shareholder value, strategic benefits, agency costs

JEL Classifications: G32, G34, L21, M14

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1. Introduction

Corporate philanthropy is increasingly popular across the world, with corporate giving amounting to more than US$21 billion in 2019 in the United States alone (Giving USA, 2020). Today, corporations donate millions of dollars in cash and resources to charities through corporate foundations and corporate giving programs, particularly in the context of disasters (Ballesteros, Usteem, and Wry, 2017). For example, the Great East Japan Earthquake and Tsunami, which occurred in March 2011 off the Pacific coast of Tohoku, claimed over 15,000 lives and displaced about 500,000 people. The disaster triggered a humanitarian response of more than US$3.5 billion in donations, with two-thirds coming from non-governmental organizations and at least US$300 million from corporations (IDC Japan; U.S. Chamber of Commerce). More recently, the COVID-19 pandemic resulted in corporate donations of over US$9 billion worldwide, representing 44% of the total amount donated (Candid, 2020).

Despite the large amounts of corporate resources dedicated to charity, standard economic theory predicts that firms should not make charitable donations, unless doing so can maximize their profits (Friedman, 1970; Benabou and Tirole, 2010; Kitzmueller and Shimshack, 2012). From an accounting perspective, the most common reason for firms to donate is to benefit from donations' tax-exempt status. Moreover, by setting up a corporate foundation, managers can time the reporting of their charitable contributions to meet financial reporting goals (Petrovits, 2006). Indeed, donations tend to exhibit a strong seasonal pattern that is correlated with firms' financial reporting dates and fiscal cut-off dates. Nevertheless, the amount of money spent on charitable giving by corporations is much larger than can be explained by tax or reporting incentives (Navarro, 1988). Therefore, it is worth asking why firms donate, and what the value implications for shareholders are.

Consistent with the idea that corporate philanthropy contradicts the profit-making purpose of a company, the prevailing view in the accounting and finance literature is that corporate giving is motivated by insiders' pursuit for private benefits at the cost of shareholder value. For example, some studies find that CEOs use corporate resources to give to charities in which they or other insiders serve as trustees, directors, or advisers. Such affiliated donations typically represent a misuse of corporate funds, which may distort investment and financing decisions (Petrovits, 2006; Masulis and Reza, 2015, 2020) and impair independent directors' monitoring incentives (Cai, Xu, and Yang, 2021). Under this agency view of corporate philanthropy, charitable giving reflects deeper agency issues in the firm, decreasing firm value (Core, Guay, Verdi, 2006; Masulis and Reza, 2015).

However, corporate philanthropy can also bring reputational benefits to firms. The strategic philanthropy view links corporate giving to the firm's business interests, and suggests that corporate philanthropy can increase firm value by enhancing the firm's social image and customer awareness (Navarro, 1988). This may help attract customers and increase sales (Madsen and Rodgers, 2014), reduce future litigation and regulatory enforcement costs (Lev, Petrovits, Radhakrishnan, 2010; Godfrey, Merrill, and Hansen, 2009), and serve as a community investment that increases support from local stakeholders and employees (Montgomery and Ramus, 2007; Douthit, Martin, McAllister, 2022). Based on this "doing well by doing good" view, corporate giving can result in better financial performance.

These two views are often contested, and there is a lack of systematic, large-scale evidence on the value implications of corporate philanthropy, and the strategic philanthropy view in particular. This is at least partly driven by the endogenous nature of charitable giving. The decision to donate is not random: donating can be the result of a firm's financial and operating performance, and corporate philanthropy and firm performance may both be driven by unobservable firm or industry characteristics.

In this paper, we investigate whether corporate philanthropy can bring strategic benefits to a firm by considering charitable giving in the context of natural disasters. Natural disasters are large, salient shocks that attract extensive media coverage and draw attention from customers, shareholders, and other stakeholders (Barber and Odean, 2008). Research in psychology and behavioral economics has shown that people tend to exaggerate the probability of extreme events such as natural disasters and react disproportionally to them, as extreme events come to mind more easily and induce an "availability heuristic" (Bordalo et al., 2012; Dessaint and Matray, 2017). Higher salience also comes with increased media coverage, which is associated with higher customer awareness and reputational gains (Servaes and Tamayo, 2013; Madsen and Rodgers, 2014; Harris, Neely, Saxton, 2021). In other words, the social capital- and reputation-building benefits of corporate giving are amplified in the context of salient disasters.

In contrast to other types of corporate giving, disaster relief donations are typically revealed in highly visible announcements made in the days and weeks following a disaster. As disasters and the corresponding disaster relief donations are typically unanticipated events, we can use an event study approach to directly capture investors' reactions to corporate giving. Moreover, natural disasters enable us to exploit disaster-specific factors, such as the timing and location of the disaster, that affect firms' endogenous decision to donate but are unlikely to be related to firm-level characteristics.

We hypothesize that the extent to which cumulative abnormal returns (CARs) around a disaster relief donation reflect strategic philanthropy depends on the saliency of the disaster: larger, more salient disasters attract more media coverage and stakeholder attention, and increase the perceived legitimacy of using corporate funds to provide relief. Based on an international sample of 20,467 firms across 37 countries over the period 2006–2018, we find that disaster relief giving by firms in unaffected areas is associated with 1.35%-2% lower

CARs in the [-1,+21]-day window following the disaster. This is equivalent to a US$7.9 million loss in market value, far exceeding the direct mechanical effect of giving away cash resources. These negative market reactions are consonant with the idea that, on average, disaster relief giving reflects an agency problem, as managers "do good with other peoples' money" (Cheng, Hong, Shue, 2020) to boost their personal reputation. However, consistent with saliency amplifying the strategic benefits of donating, we find that returns to corporate giving increase with disaster saliency. Proxying saliency through disaster severity (in terms of damage caused) and relevance (in terms of web search intensity), every percentage point increase in severity and search intensity boosts the returns from donating by 0.56% and 1.70%, respectively. In other words, market reactions reflect the higher strategic benefits of donating as disaster saliency increases. We further show that these results are concentrated in environments with greater market efficiency (i.e., economies with low R^2 and firms with smaller post-earning announcement drifts), suggesting that they indeed reflect investors' perception about the value implications of disaster relief giving.

Motivated by the accounting literature that investigates reporting in the charitable sector (e.g., Beck et al., 2021; Duguay, 2022), we address the concern that a firm's decision to donate is not random by using the timing of the disaster relative to the firm's financial year end date as an instrument for donation propensity. Firms' propensity to donate is higher for disasters that occur early in their financial year, as firms often set aside a fixed amount of funds for their charitable programs at the start of the year. Our data indeed shows that the donation likelihood for unaffected firms is almost 2 times higher around disasters that occur in the first three months of the firm's financial year relative to disasters occurring later in the year. We confirm our baseline results in this instrumental variable setting and find that donation likelihood is positively related to CARs following large disasters. We obtain similar results when using a firm's geographical proximity to the disaster as an alternative instrument in a sample where we exclude firms with customers, subsidiaries, or suppliers in the disaster zone.

To mitigate the concern that we capture market reactions to the indirect effects of the disaster on firms' operations or stakeholders, we manually collect data on announcements of firms' disaster relief efforts in media releases. We confirm that over 95% of firms announce their donations in the [-1,+21]-day window around the disaster event, and that the [-1,+1]-day CARs around the disaster relief announcement increase as disaster saliency increases. These results align closely with the results from our main large-scale sample, reducing concerns that we may be capturing non-disaster related effects in our main tests.

Next, we distinguish strategic philanthropy from agency-motivated giving by focusing on firm- and industry-level characteristics. We find that returns are less negative for donating firms with more domestically oriented operations and for firms that rely more on marketing in their day-to-day operations. We also find that returns from donating are higher for firms with higher effective tax rates, for whom the donation tax shield is higher. Conversely, we find that returns are more likely to reflect agency-motivated giving (i.e., are more negative) in firms with poor governance.

Next, we find that donating affects returns by improving the firm's reputation, customer awareness, and stakeholder support. Firm-specific web searches increase for firms donating to a large disaster relative to nondonating firms, as do domestic sales, analyst recommendations, employee satisfaction scores, and the likelihood of winning a CSR award. We further manually confirm that the firms in our sample are unaffected by the disaster, by excluding those with subsidiaries, suppliers, or customers in affected areas, and confirm our results for various subsamples and specifications.

Overall, our results suggest a more nuanced view of corporate philanthropy. Although the strategic benefits of corporate giving on average do not outweigh the costs stemming from agency problems, such agency costs can be mitigated, and in certain cases more than off-set, when firms use their giving to build social capital and stakeholder support in the context of salient, attention-grabbing events. This is consistent with the Friedman (1970) doctrine: corporate philanthropy has been prevalent because in certain circumstances, it can contribute to firm profitability.

2. Data and Summary Statistics

2.1 Data

Our sample consists of 20,467 international, publicly listed firms for which accounting and financial data are available from Datastream, Compustat, or CRSP. We exploit the unanticipated nature of disasters, and the corresponding disaster relief donations, by using an event study approach to test shareholders' market reactions to corporate giving. We calculate a firm's CARs relative to expected returns estimated using the capital asset pricing model (CAPM) over a [-252,-2] window, where we use the local market index of the firm's home country as the benchmark index. We use an event window of one day before the disaster to 21 days after the disaster to ensure we capture the majority of firms' disaster relief announcements following the event.[1] Based on a sample of disaster relief press releases and media announcements, we confirm in Figure 1 that less than 5% of donations were made outside the [-1, +21]-day window around the disaster. This alleviates the concern that we may not be capturing firms' disaster relief donations in our event window. [2]

[Insert Figure 1 about here]

[1] We consider the headquarter country as the home country, rather than the country of incorporation, as the headquarters location is typically where most business is conducted and where most employees, customers, and suppliers are located. We include the day before the disaster in the event window to account for the possibility that some firms proactively announce their donation, and for cases where disasters happen late in the day.

[2] EM-DAT identifies the disaster start date as the first date the disaster caused substantial damage. For example, Hurricane Harvey reached tropical storm status on August 17, but it only made landfall on August 24. Therefore, August 24 is considered as the start date. Subsequent landfalls in other areas are not listed as separate events.

We obtain data on natural disasters from EM-DAT, an international disasters database that includes all disasters worldwide since 1900 for which at least 10 or more deaths occurred, 100 or more people were affected, a state of emergency was declared, or a call for international assistance was made. The database lists the cities, counties, and regions affected by the disaster, allowing us to distinguish firms headquartered in affected areas from those located elsewhere. As we are interested in firms' market reactions following a natural disaster, our unit of observation is at the firm-disaster level. We consider all firm-disaster pairs where the disaster occurred in the same country as the firm's headquarters.[3] In order to ensure the disaster is unanticipated, we focus on sudden disasters, defined as those categorized as an "earthquake," "landslide", or "volcanic activity," or under the sub-categories "tropical storm," "flash flood," "tropical cyclone," or "tsunami" (sub-categories of storm types) in EM-DAT.[4] This results in a total sample of 53,388 observations covering 330 natural disasters in 37 countries, of which 52,536 observations are firms located in ZIP or Postal Codes not directly affected by the disaster (the remaining 852 observations are firms in affected areas). Most disasters occurred in China (82), the U.S. (58), and Japan (41), as shown in Internet Appendix IA.A. Our analysis focuses on firms in unaffected areas to avoid capturing market reactions to disaster-induced operational or financial changes in the firm.

We obtain data on firm-level donations from Foundation Maps, which provides highly detailed information on funders, grant descriptions, and recipients worldwide. Foundation Maps collects donation information from various public sources, including government filings, websites, news items, and other funder networks. It covers grants by individuals,

[3] In unreported tests, we find that our results also hold when considering donations by firms located outside of the country where the disaster occurred. However, the effects are economically smaller.

[4] Non-immediate disasters, such as droughts or extreme heat and cold waves, can to a certain extent be anticipated and may be viewed as less salient by investors and the public. There is often no clear-cut start date for a long-term disaster, with the scale of the disaster typically only becoming clear weeks or months later.

corporations, governments, public charities, and nongovernmental organizations. To our knowledge, it is the most comprehensive data source for donations information with global coverage. For the purpose of our analysis, we collect data on grants by publicly listed corporations (ad hoc, via a corporate giving program, or via a company-sponsored foundation) that can be linked to disaster and emergency management or that have disaster victims as the targeted population.

We manually match corporate grant information from Foundation Maps to our sample of publicly listed firms based on foundation and donor names, descriptions, and locations. We match each grant to a firm-disaster pair based on the recipient's location and grant description. This allows us to identify market reactions to a firm's disaster relief donation decision while accounting for the severity of the disaster. We also cross-reference the data in Foundation Maps with a sample of manually collected media releases to ensure the donations were publicly announced around the disaster event.[5]

Although the percentage of publicly listed firms making disaster-specific donations is relatively small, the large coverage of our analysis means the donation-level sample still consists of 1,219 disaster-specific grants by 433 firms. The large share of nondonating observations arises from the fact that a vast majority of publicly listed firms do not donate to small- or medium-sized disasters.[6] Figure 2 provides a geographic overview of our sample distribution, where darker shades indicate countries that are represented more frequently in our sample. Countries with more disasters (e.g., the U.S. and China) or with more publicly listed firms (e.g., Japan, Australia, and India) appear more often in our sample. Countries

[5] In contrast, non-disaster relief donations tend to be disclosed in firms' end-of-year annual reports, together with other information on firms' nonphilanthropic activities, accounting data, performance, etc., complicating the analysis of the direct effects of giving on firm value.

[6] To address the imbalance between donating and non-donating firms, we use a 1:2 matched sample in Table 5. In additional tests, we also exclude disasters for which no donations materialized (results available on request).

that have no recorded disasters in the EM-DAT database between 2006 and 2018 or that have no publicly listed companies in CRSP or Compustat are not included in our sample and are indicated in gray.

[Insert Figure 2 about here]

2.2 Summary Statistics

Table 1 provides summary statistics for our main sample consisting of 52,536 firm-disaster observations. We consider a range of variables that may affect philanthropy and market reactions around disasters. Stock market reactions following a natural disaster are close to zero, and are most negative in the [+3,+21] window following the disaster. Given that we consider firms located in unaffected areas, the small economic effect is not surprising. 2.3% of firms make disaster relief donations, for an average amount of US$502,680. The average sudden disaster results in US$4 billion in damages.

[Insert Table 1 about here]

Table 2 shows summary statistics for donating and nondonating firms. CARs are 0.34% lower for donating firms, but the difference is not statistically significant. Donor firms tend to be larger in terms of total assets and market value, and they have a higher average sales-to-assets ratio. In line with the agency view of corporate philanthropy, donor firms also have weaker corporate governance, proxied by a higher value of the Entrenchment Index (E-Index). The E-Index is a self-constructed index for our international sample, which closely follows the U.S. E-Index developed by Bebchuk, Cohen, and Ferrell (2009). Firms that make disaster-specific donations tend to be more profitable, have more fixed assets, lower R&D expenses, and higher institutional ownership. One economic reason for firms to engage in philanthropy is the tax deductibility of donations (Navarro, 1988). Donors indeed have higher effective tax rates prior to a disaster, and thus can benefit more from the donation tax shield.

[Insert Table 2 about here]

3. Results

3.1 Market Reactions to Disaster Relief Donations

We investigate the relation between corporate philanthropy and firm value by evaluating stock market reactions around natural disasters for donating and nondonating firms in unaffected areas following an unexpected, sudden natural disaster. We estimate the following regression:

$$CAR[-1,+21]_{i,d} = \alpha + \beta \cdot (Disaster\ Relief\ Donation)_{i,d} + \boldsymbol{\gamma \cdot (Controls)_{i,t-1}} + e_{c,t} + f_{j,t} + g_g + \varepsilon_{i,d} \quad (1)$$

where *Disaster Relief Donation* is a binary indicator for whether firm *i* donated following disaster *d*. We include a vector of firm-level control variables (*Controls*), which includes firm profitability (*ROA*), fixed assets (*PPE-to-assets*), firm size based on its total assets (*Size*), as well as an indicator for foreign activities to proxy for firms' foreign customer base (*Foreign Activities*) and the firm's effective tax rate to capture tax-motivated giving (*Effective Tax Rate*).[7] All accounting variables are measured in the year before the disaster happened. *e* denotes country × year fixed effects, *f* is a vector of industry × year fixed effects, and *g* denotes district (county, state, province, or administrative area) fixed effects. The inclusion of these various fixed effects subsumes all country- and industry-level factors that may affect stock returns and corporate philanthropy decisions, and compares donors and nondonors within the same country-year and industry-year. Heteroskedasticity-robust standard errors are

[7] Our results also remain robust to controlling for firms' sales-to-assets ratio, as charitable giving may be affected by variation in firms' sales (Grieser, Hadlock, and Pierce, 2021).

clustered at the district level, and our results are robust to clustering at the disaster level.[8] In additional tests, we use a [-1,+1] window for a hand-collected subsample of donation announcements in media releases.

Panel A in Table 3 reports the results from OLS estimations for our main specification as set out in Equation (1). First, we show in column (1) that donating firms located in unaffected areas earn 1.35% lower returns in the [-1,+21]-day window around the disaster relative to nondonating firms in unaffected areas.[9] The negative stock market reaction is in line with findings in previous studies, and consonant with the notion that corporate philanthropy on average reflects agency concerns, which may be related to managers' pursuit of personal reputation benefits at the cost of shareholders. Although there may be a mechanical effect due to the firm giving away cash when making a donation, the average market value loss for donating firms far exceeds the average donation amount (US$500,000). In untabulated results, we estimate the propensity of a firm providing disaster relief giving and find that firms with more managerial entrenchment, lower governance scores, lower institutional ownership, and more powerful CEOs are more likely to donate. These results are consistent with Masulis and Reza (2015) and Cai et al. (2021). The consistency with previous studies reduces the concern that our findings are driven by our sample choice or that they are specific to disasters. The coefficients for the control variables are largely insignificant, indicating that few other firm characteristics explain firms' CARs, further reducing concerns that we capture effects not related to disaster relief donations.

Second, when we separate the 23-day event window into a [-1, +3]-day window (which is

[8] We also account for potential cross-correlation in returns in a portfolio regression setting in Internet Appendix IA.B by constructing portfolios for donating and non-donating firms, respectively, following the approach in Campbell, Lo, and MacKinlay (1997) and Eckbo et al. (2021).
[9] We perform a placebo test by calculating CARs over a [-30, -1] window before the disaster, and find no significant results. Results available upon request.

more likely to capture any direct effect of the disaster on the firm) and a [+3, +21]-day window (which is more likely to capture the donation effect), we find negative and significant coefficients for both windows. We however retain the [-1,+21]-window for our main tests as a sizeable fraction of firms announce their donation between days t_{-1} and t_{+3} (Figure 1). The returns for unaffected donating firms are 0.48% lower in the "disaster window" (column (2)) and 5% lower in the "donation window" (column (3)) relative to non-donating firms. These results suggest that the negative stock market reaction is not entirely triggered by the disaster per se, but to a large extent by a firm's disaster relief giving, resonating with the agency view of corporate philanthropy. We additionally control for firm fixed effects in column (4), obtaining qualitatively similar results. However, the inclusion of firm fixed effects reduces our sample size as some firms do not have at least two (disaster donation) observations over our sample period. We therefore focus on the specification in column (1).

In Panel B, we investigate the hypothesis that the returns from donating increase with the saliency of the disaster, which increases the strategic benefits of giving. We capture disaster saliency by considering disaster severity and relevance. More severe disasters are generally subject to more extensive media coverage and publicity and increase the legitimacy of the donation. Firms' charity campaigns are more visible and can provide a stronger signal of stakeholder commitment and support. We therefore expect that the returns from donating increase with the scale of the disaster.

In column (1), we proxy for disaster saliency by considering disaster severity in terms of (the logarithm of) the total damage caused in dollar value (*ln(Disaster Size)*).[10] Consistent with the notion that larger disasters attract more attention and increase the legitimacy of

[10] Total damage captures physical damage to infrastructure, pastures, etc., but does not account for human deaths. In untabulated results (which are available upon request), we define disaster size based on total deaths, and find that the coefficients are similar in terms of significance and magnitude.

donating, we find that corporate giving increases CARs by 0.06% for every percentage increase in disaster size. Expressed in terms of disaster size deciles, disaster relief donations in the lowest decile reduce returns by -3.8%, and moving up one decile increases returns by 0.4%, such that returns turn positive for disasters in the highest size decile.

In column (2), we investigate disaster relevance in terms of public awareness, proxied by web search intensity for disaster-related search terms. If more salient disasters attract more attention, this should be reflected in how often they are detected in web searches (Israeli, Kasznik, and Sridharan, 2022). Search intensity is measured as the logarithm of the number of Google searches for a specific disaster in the month that it occurred (e.g., the frequency of people searching for information using keywords such as “hurricane,” “tsunami,” “earthquake,” etc.) (*ln(Web Search Intensity)*). The results in column (2) align closely with those for disaster size: every percentage increase in search intensity increases firm returns by 1.7%. These results therefore reflect the increased strategic benefits of donating when public awareness of the disaster is higher.

We also construct indicators for small disasters (damage in the bottom quartile, i.e., less than US$2 million (*Small Disaster*)) and for large disasters (damage in the top quartile, i.e., greater than US$1.8 billion (*Large Disaster*)). Column (3) shows that the negative returns from donating are driven by small-scale disasters, as only the interaction coefficient appears statistically significant. This aligns with our expectations that there are fewer strategic benefits from donating (through engaging in marketing, reputation-building, and community-building) following small disasters. In unreported tests, we find that the negative coefficient (-6.89%) is driven by “vague” donations for which little information is provided on how the funds will be used, and by overly large donations to small disasters: above-median donations (averaging US$509,533) to small disasters trigger up to -12.2% lower returns, whereas below-median donations (averaging US$48,170) earn -1.0% lower returns.

Column (4) shows that donors earn 1.77% lower CARs than nondonors if the disaster is small or medium, but this effect is offset for large-scale disasters, resulting in small positive net returns of 0.06%. This again confirms that disaster saliency matters: for firms in unaffected areas making donations following small-scale disasters, the lack of strategic benefits, reduced legitimacy, and potentially higher agency concerns results in negative shareholder returns. For larger, more salient disasters, the strategic value of disaster relief giving is higher, offsetting the agency-related costs.[11] A potential concern is that non-donating firms may be indirectly affected by the disaster, resulting in fewer resources to donate and lower returns (due to e.g., supply chain disruptions) following the disaster. We address this concern in Panel B of Internet Appendix IA.C. We obtain data on U.S. firms' subsidiaries (from WRDS Subsidiary Data), major customers (from WRDS Segments), and suppliers (from FactSet Revere) and manually verify whether these are located in affected states or counties. We then exclude firms with subsidiaries, customers, or suppliers that may be affected by the disaster, and find that our results remain strongly significant.

[Insert Table 3 about here]

The above interpretations hinges on the assumption that, on average, the market is efficient and investors understand the value implications of disaster-relief giving. That is, the market's response to disaster-related donations is reasonably rational. To ensure that the above results indeed reflect investors' rational reactions in an efficient market, we partition our sample based on firms' level of market efficiency. We consider country-level (country R^2, following Eun, Wang, and Xiao (2015)) and firm-level (post-earnings announcement drift

[11] We confirm these results for a sample of U.S. firms in Panel A of Internet Appendix IA.C as this is the benchmark sample used in the literature on agency-motivated donations.

(PEAD) beta, following Coles, Heath, and Ringgenberg (2022)) proxies for market efficiency.[12] In Internet Appendix IA.D, we find that the results are concentrated in environments with high market efficiency, i.e., in countries with a low R^2 (Panel A, columns (1)-(4)), and in firms with a low β_{PEAD} (Panel A, columns (5)-(8)). In contrast, we do not find significant results for firms in low market efficiency environments (Panel B). These results further corroborate the basic premise of using market reactions to disaster donations to capture the value implications and incentives of corporate giving.

3.2 Instrumental Variable Approach

Although natural disasters are largely exogenous, the decision to provide disaster-relief giving is still an endogenous choice by the firm. To identify the causal effect of corporate donations on firm value, we exploit exogenous disaster-level factors to account for the decision to donate in an instrumental variable (IV) test. We use the timing of the disaster relative to the firm's financial year as an instrument for the endogenous decision to donate.

The first underlying assumption is that, all else equal, firms are more likely to donate if a disaster occurs at the start of the financial year, when firms tend to set aside a fixed amount for philanthropy for the whole year.[13] If an unexpected disaster occurs later in the year, these funds may have been exhausted, decreasing the likelihood that the firm will provide a disaster relief donation. We confirm in Panel A of Internet Appendix IA.E that the likelihood of a firm donating to large disaster occurring in the first three months of its financial year is

[12] Country R^2 is obtained from Eun et al. (2015), where a lower R^2 indicates lower stock price co-movement and more firm-specific information incorporated in stock prices at the country level (i.e., a more efficient market environment). Firm-level market efficiency is calculated by taking the beta from regressing [+3,+63]-day CARs following earnings announcements in the 2 to 24 months prior to a disaster on the standardized unexpected earnings (SUE) of the announcement. A higher β_{PEAD} indicates a higher predictable PEAD and, therefore, a less efficient market environment.

[13] For example, the Ikea Foundation places funds with emergency relief organizations at the start of each year. See: https://ikeafoundation.org/about/the-way-we-work/

almost 2 times higher than the likelihood of donating to disasters at other times in the year. This setting therefore allows us to exploit the arguably exogenous variation in firms' financial reporting dates and disaster dates.

We construct an indicator for donations occurring in the first three months of a firm's financial year and label this IV *Early Disaster*. We then instrument *Disaster Relief Donation* with *Early Disaster*, and *Disaster Relief Donation* × *Large Disaster* with *Early Disaster* × *Large Disaster*. We exclude country × year FE in the IV test as there is relatively little cross-firm variation in financial year-end dates within countries. For robustness, we use the firm's geographical proximity to the disaster as an alternative instrument for its donation decision, where we exclude firms with subsidiaries, customers, or suppliers in disaster-affected areas.

It is unlikely that a firm's financial year-end date affects abnormal returns in the 3-week window after a disaster through channels other than the firm's decision to provide disaster-relief giving. To verify this, we compare firm × disaster observations where the disaster occurred at the start of the firm's financial year to those where the disaster occurred at other times in the year in Panel B of Internet Appendix IA.E. We find no significant differences in financial performance or in the degree to which the firm may be affected, suggesting that the donation decision is unlikely to be driven by firm-level fundamentals.

Table 4 presents the 2SLS results from the IV analysis. We test the relevance condition that *Early Disaster* is correlated with *Disaster Relief Donation* in columns (1) and (2) and find that firms are more likely to donate if a disaster occurs at the start of their financial year (F-stat = 266.83), with both instruments being strongly positively related to donation likelihood. In the second-stage estimations, we find that a higher donation likelihood, as predicted by the timing of the disaster, is negatively related to CARs: on average, donating decreases CARs by 6.30% (column (3)). Disaster saliency however mitigates this negative effect: donation likelihood is positively related to returns for large disasters, offsetting the negative main effect by 6.76% (column (4)).

We report additional robustness tests for our IV analysis in Appendix IA.F. We first address the concern that some types of disasters, such as cyclones and tropical storms, are more likely to occur at specific times in the year. The relevance condition could then be violated if firms anticipate such disasters to occur during certain seasons and account for this when setting aside annual philanthropy funds. In column (1) of Panel A, we exclude tropical storms and cyclones from the sample, and find that donating to large disasters is still positively related to returns. In column (2), we perform a placebo test where we consider the firm's returns in a [-30,-1] window before the disaster. If the timing of the disaster is related to returns only through the donation decision, we should not see any significant returns in a non-disaster window: as expected, we find no significant returns.[14]

In Panel B, we conduct a second IV test using firms' proximity to the disaster zone as an alternative instrument. The underlying assumption is that firms in unaffected areas that neighbor the disaster zone are more likely to provide relief giving, as disasters are more salient to firms located closer to the disaster zone (Dessaint and Matray, 2017). We find in the first-stage estimations in columns (1) and (2) that geographic proximity is indeed positively related to donation likelihood. The second-stage results in column (2) echo our main findings, with a negative relation between donation likelihood and CARs for small disasters, but a positive relation for large disasters. One may be concerned that geographically closer firms are more likely to be indirectly affected via suppliers or customers in disaster areas, which could be reflected in returns following the disaster. However, in this scenario, we would expect to find *lower* returns for donating firms, rather than higher returns. Nevertheless, to

[14] It is possible that firms' incentives to donate are driven by the extent to which their supply chain is affected by the disaster. Barrot and Sauvagnat (2016) show that disaster-related shocks propagate through firms' supply chains via input specificity. In unreported tests, we show that our results still hold when accounting for input specificity, proxied by being in an industry with non-differentiated goods.

further alleviate this concern, in column (4), we exclude firms with subsidiaries, customers, or suppliers in affected states for a sample of U.S. firms and find that our results still hold.

[Insert Table 4 about here]

3.3 Donation Announcement Dates

A potential concern is that our 23-day event window captures market reactions to the effects of the disaster on the firm's operations, customers, or suppliers, rather than the effects of the donation. This concern is at least partly alleviated by distinguishing short and long event windows and by excluding firms with operations and supply chain relationships in affected areas. Nevertheless, we further mitigate this endogeneity concern by manually collecting information on the announcement dates of firms' disaster relief donations in press releases and articles in major media sources. This approach reduces our sample size due to data availability (i.e., the sample is bounded by the media announcements published in English that we can find online ex post through a manual search), but provides a more precise way of gauging market reactions to firms' giving. Where firms make follow-up grant announcements, we measure market reactions to the first announcement following the disaster event. By using a short [-1,+1] window around the donation announcement, we can more precisely capture the effect of the donation rather than that of the disaster or other confounding factors.

In Table 5, we show results for a matched sample where we match every firm × disaster donation observation to two control observations using nearest-neighborhood matching with replacement, where observations are matched based on country, industry, *ROA*, *PPE/Assets*, *Size*, *Foreign Activities*, and *Effective Tax Rate*. We test our baseline model in column (1), where we find that donating is, on average, positively related to CARs. While this is different from our findings in Table 3 where we use the [-1, +21] event window, it aligns with the strategic philanthropy hypothesis: due to the nature of our online search process, our announcements sample is skewed towards larger, more visible disasters, for which the strategic benefits of donating are higher. Nevertheless, we investigate agency-motivated giving in column (2), where we consider whether CEOs or other executives use disaster-relief giving to boost their personal reputation at the expense of shareholders. We proxy for the CEO reputation-boosting effect of corporate giving by identifying whether the CEO's name is mentioned in a firm's disaster relief media announcement. We indeed find that returns are 0.25% lower if the announcement is CEO-focused, consistent with agency-motived giving in which CEOs can extract private benefits. Moreover, in unreported tests, we find that this effect is amplified for above-average donation amounts.

In columns (3)-(5), we investigate strategic corporate giving. As before, we find that returns increase as disaster severity and relevance increase (columns (3) and (4)), and that returns are 1.15% higher for firms donating to large disasters relative to non-donating firms (column (5)). Therefore, even when changing our data source and event window, we still find that CARs increase with public awareness and donation legitimacy as proxied by disaster saliency. Importantly, the results from this more detailed sample align with those from our main, large-scale sample, which reduces concerns that we may be capturing different effects in the main tests.

[Insert Table 5 about here]

3.4 Distinguishing Strategic and Agency-Motivated Philanthropy

To distinguish agency-motivated giving from strategic philanthropy, we interact *Disaster Relief Donation* with firm-, industry-, and donation-specific characteristics that reflect either the importance of reputation to the firm or the potential for agency problems in the firm.[15] We first interact the donations indicator with an indicator for the firm's geographic focus (*Domestic Focus*). Internationally active firms may source inputs or sell products abroad, have foreign subsidiaries, and overall rely less on customers and suppliers in their home country. A domestic natural disaster is then less relevant to their overall reputation. In column (1) of Panel A in Table 6, we find that donations by international firms are associated with 2.1% lower returns, while donations by domestic firms are associated with 0.88% (= 2.11% - 1.23%) lower returns.

In column (2), we focus on firms that spend relatively more on marketing, as these firms may benefit more from the increased visibility and awareness of their charity programs (Servaes and Tamayo, 2013). Following Manchiraju and Rajgopal (2017), we consider whether a firm has above-average selling, general, and administrative expenses (*High SG&A Expenses*) as a proxy for its marketing intensity. We find that donations by firms with low SG&A expenses are associated with 2.21% lower returns, but this is almost completely off-set for firms with high SG&A expenses. We perform a similar test where we focus on firms' R&D expenses. Navarro (1988) and Brown, Helland, and Smith (2006) show that high R&D firms (e.g., pharmaceutical firms) can benefit more from making donations, as they are often subject to public scrutiny and rely more on intangibles. Consistent with this conjecture, we find in column (3) that low-R&D firms' donations decrease shareholder value by 1.54%, whereas donations by high-R&D firms increase returns by 2.97% (= 4.51% - 1.54%).

We next consider firms in regulated industries, as these firms can use donations to lower

[15] Corporate giving can also be motivated by firms seeking political influence, e.g., through donating to congressional districts whose representatives are on committees that are strategically relevant to the firm (Bertrand, Bombardini, Fisman, and Trebbi, 2020), which is consistent with the strategic philanthropy view. However, politically motivated giving is less likely in a natural disaster setting, where recipient districts are determined by the disaster zone.

the expected costs of future regulatory and enforcement actions by improving their public image and enhancing their standing with regulatory agencies and legislators (Godfrey et al., 2009; Masulis and Reza, 2015). In column (4), we find that donations by firms in regulated industries earn 1.01% higher returns than donations by firms in other industries.[16]

[Insert Table 6 about here]

As indicated by the negative coefficient on the donation indicator in Table 3, our disaster relief context does not completely eliminate the costs associated with agency-motivated giving, despite increasing the strategic benefits of donating. To further distinguish the agency view on corporate giving, we focus on firm characteristics that increase the potential for agency-motivated giving in Panel B. Following the literature, we focus on several proxies for the quality of corporate governance, as poor governance is usually associated with greater agency costs. We first consider the MSCI Governance Index, a comprehensive measure of firm-level governance that includes board independence, anti-takeover provisions, as well as accounting quality and board diversity. We find in column (1) that donor firms with lower (i.e., below-average) governance scores earn -2.36% lower returns than nondonor firms, consistent with agency-motivated philanthropy. We find similar results when considering firms with low levels of institutional ownership in column (2), as institutional investors help improve portfolio companies' governance (e.g., Aggarwal et al. (2011)).

We next investigate the ratio of the CEO's total wage relative to the wage of the second highest-paid executive in the firm ("CEO pay slice"), which has been used as a proxy for how powerful a CEO is within the top management team (e.g., Bebchuk, Cremers, and Peyer

[16] In unreported tests, we investigate whether firms in more competitive markets are more likely to use donations to build their brand. We find that returns increase by 0.6% for donating firms in highly competitive industries, proxied by being in a below-average Herfindahl-Hirschman Index (HHI), relative to nondonors in less competitive industries.

(2011)). Firms with powerful CEOs are more likely to have agency concerns. Donating firms with powerful CEOs are indeed associated with 6.56% lower returns relative to other firms (column (3)). Next, we construct an entrenchment index (E-Index) following Bebchuk et al. (2009), which measures managerial entrenchment based on the presence of staggered boards, poison pills, supermajority requirements, and other anti-takeover provisions. In column (4), we show that donating firms with a higher E-Index (worse governance) earn 0.41% lower returns. Overall, these results confirm that donating is related to lower returns in firms with poor governance, consistent with previous studies.

It is important to note that we control for firms' effective tax rate in all specifications to ensure that our results do not merely capture the tax exemption motive, as both the agency view and the strategic philanthropy view can predict managers' use of corporate charitable giving to avoid taxes (Navarro, 1988; Petrovits, 2006). To further investigate whether firms strategically use tax incentives when making their donation decision, we explicitly test whether market reactions to corporate giving vary with firms' effective tax rates in Panel C. Consistent with a taxation benefit of donating, we find that returns increase by 0.31% for every 10% increase in the effective tax rate (column (1)). Donations by firms with negative effective tax rates (i.e., zero tax rates or tax rebates) earn returns insignificantly different from zero (column (2)), while firms with high effective tax rates earn 1.5% higher returns when donating relative to not donating (column (3)).

3.5 The Mechanisms

We next take a more in-depth look at the channels through which donating affects shareholder returns. It is relatively straightforward to see how agency-motivated disaster relief giving reduces firm value: managers make value-destroying decisions by giving away shareholders' money. However, the strategic benefits of giving are less clear. We therefore investigate through which mechanisms strategic giving may be able to enhance firm value. As an illustrating example, consider the case of Chinese sports company Hongxing Erke, whose donation to victims of the 2021 Henan floods went viral on the internet, sparking a 280% increase in sales. The firm received praise from government authorities, and local attractions offered discounts to Erke employees (Yan, 2021). Donating may therefore boost returns by increasing customer awareness, sales, and employee satisfaction. At the same time, many investors questioned the legitimacy of large flood-relief donations by a company that recorded a US$33.7 million deficit in 2020, highlighting the trade-off between strategic philanthropy and agency-motivated giving.[17]

In Table 7, we first investigate whether public awareness increases more for donor firms relative to nondonor firms, where we capture awareness via the intensity of firm-specific Google web searches in the month of the disaster. We find that donor firms obtain an 8.3% increase in web searches relative to nondonor firms during the disaster month with the effect increasing to 33.8% (= 8.3% - 4.2% + 29.6%) for donations following large disasters (column (1)). Disaster relief giving indeed seems to increase public awareness of the donating firm, and this effect strengthens with disaster saliency. Moreover, these results also highlight that we are capturing highly visible donation announcements, even in our broader sample.

Next, we investigate whether stronger awareness translates into a greater change in sales growth and stakeholder support. Although donating on average does not affect sales growth, donating to a large disaster is associated with 3% higher domestic (but not foreign) sales growth (column (2)). Consistent with the evidence from corporate charitable contribution matching programs and employee giving (Balakrishnan, Sprinkle, and Williamson, 2011; Douthit, Martin, and McAllister, 2022), we further find that donating also

[17] We explore the role of donation size and type in the trade-off between strategic philanthropy and agency-motivating giving in Internet Appendix IA.G.

affects the firm's support from employees. Donating is on average not significantly related to employee support (proxied by the percentage change in employee satisfaction, where the sample is limited to firms with data coverage in Refinitiv ESG), but it increases firms' employee satisfaction score by 1.8% (= 3.0% - 1.2%) following large disasters (column (3)). In addition, donating firms are 11.3% more likely to win a CSR award in the year of the disaster, amplifying to 18.6% for large disasters (column (4)), and they are 10% more likely to receive an analyst recommendation upgrade (column (5)). Taken together, these results show that donating affects returns through fundamental changes in future cash flows, by increasing firm reputation, customer awareness, and by building stakeholder and employee support.

[Insert Table 7 about here]

Overall, these results confirm prior studies which show that corporate philanthropy is a manifestation of agency problems and poor governance. However, our disaster-based framework provides evidence that strategic philanthropy is an equally important driver of corporate giving and that donating can increase firm value if the strategic benefits are sufficiently large.[18]

4. Conclusion

We study the motivations and value implications of corporate philanthropy in a large-scale, global sample of publicly listed companies. We show that agency-motivated and strategic corporate giving are not mutually exclusive, and that strategic philanthropy can offset the negative returns associated with agency-motivated giving. We exploit natural disasters as large, salient events that amplify the strategic benefits of donating and use exogenous

[18] We provide additional robustness tests in Internet Appendix IA.H, where we consider the role of firm's ownership structure and investigate various alternative subsamples and specifications.

disaster-specific factors to account for the decision to donate. We find that, consistent with the agency-motivated view of corporate giving, donating is associated with 1.35% lower returns on average. However, this negative effect is mitigated for donations following more salient disasters, which increase investor and customer awareness and boost the reputation-building benefits of donating. We confirm these results in an instrumental variable setting where we use the timing and location of the disaster to account for firms' decisions to donate, and in a matched subsample of media releases where we estimate returns in a [-1,+1]-window around the donation announcement. We find that donating affects returns by increasing customer awareness, reputation, sales growth, and employee support.

Overall, our results indicate that the reputation- and social capital-building benefits of corporate giving can mitigate, and in certain cases more than off-set, the agency costs of corporate philanthropy. In other words, corporate giving can add value for shareholders when firms can sufficiently boost their reputation and social capital. We thereby offer a more holistic view of the nature and implications of corporate philanthropy, a fundamental issue in economics, finance, and accounting as corporations around the world are increasingly engaged in CSR and philanthropy. Our findings suggest that whether and how corporate philanthropy should be encouraged depends on a wide range of contextual factors. At a deeper level, our findings provide a plausible answer to the long-lasting puzzle of why corporations give to charities, despite the criticism by many economists. Friedman (1970) might still be right: charitable giving should only be done by corporations if doing so increases shareholder wealth.

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Figure 1: Number of Days between Disaster and Public Donation Announcement (*N*=619)

This figure shows the distribution for the number of days between the start of the disaster event and the disaster relief announcement in press releases and media articles.

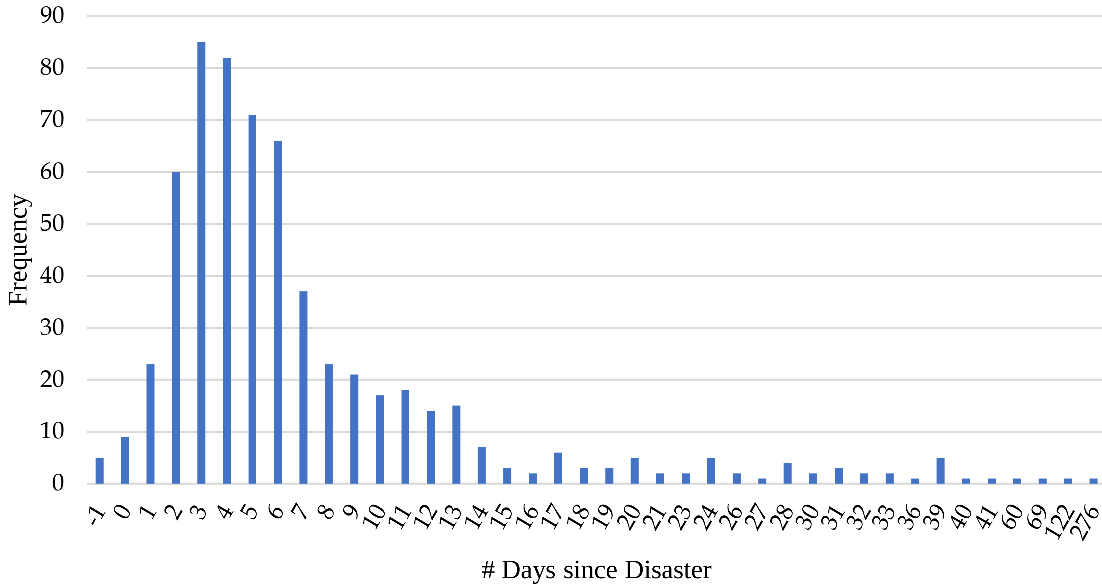

Figure 2: Geographic Sample Distribution (Disaster × Firm)

This figure shows the country distribution of the main sample consisting of 52,536 disaster-firm observations. Countries that are relatively more represented in our sample are indicated in darker shades.

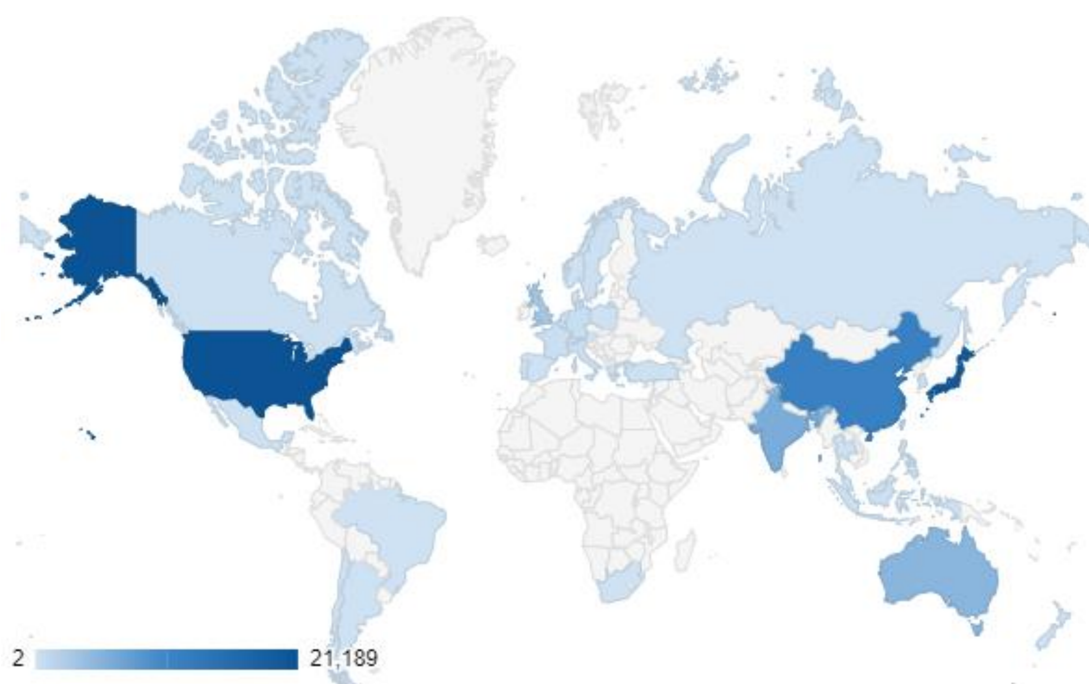

Table 1: Summary Statistics

This table shows summary statistics for the full sample of observations at the firm-disaster level. Variable definitions are in Appendix Table A. Continuous variables are winsorized at the 1% and 99% level, and accounting variables are measured in the year of the disaster.

Variable	***N***	**Mean**	**Median**	**Std. Dev.**	**25th pct**	**75th pct**	**Min**	**Max**
CAR[-1,+21]	52,536	0.002	0.001	17.57	-10.16	9.962	-35.20	36.18
CAR[-1,+3]	52,536	0.298	0.001	5.889	-3.118	3.294	-10.99	13.61
CAR[+3,+21]	52,536	-0.161	-0.088	17.74	-10.51	10.07	-36.87	36.61
Disaster Relief Donation	52,536	0.023	0	0.151	0	0	0	1
Disaster Size ($Mil)	52,536	4,042	633	7,614	177	2,700	56	30,000
Search Intensity	52,536	2.975	3.044	0.973	2.773	3.466	2.565	4.615
Small Disaster	52,536	0.272	0	0.445	0	1	0	1
Large Disaster	52,536	0.337	0	0.473	0	1	0	1
Total Assets ($Mil)	52,536	22,332	1,353	70,897	132.4	8,874	0.051	446,333
Market Value ($Mil)	52,536	1,638	232.3	10,332	82.05	683.2	0.001	790,050
Sales/Assets	52,536	0.931	0.741	0.832	0.380	1.229	0	4.642
Intangibles/Assets	52,536	0.058	0.021	0.111	0.005	0.056	0	0.727
CapEx/Assets	52,536	0.046	0.030	0.056	0.017	0.054	0	0.462
ROA	52,536	-0.033	0.039	0.261	-0.019	0.082	-1	0.346
PPE/Assets	52,536	0.262	0.196	0.241	0.064	0.392	0	0.982
Effective Tax Rate	52,536	0.136	0.051	0.229	0.001	0.251	-0.318	0.755
Foreign Activities	52,536	0.447	0	0.497	0	1	0	1
SG&A/Assets	52,536	0.282	0.151	0.372	0.068	0.333	0.005	0.941
R&D Expenses/Assets	52,536	0.015	0	0.042	0	0.006	0.000	0.211
Institutional Ownership	52,536	0.271	0.093	0.332	0.017	0.481	0	1
MSCI Governance Index	9,768	5.336	5.3	1.609	4.3	6.4	0	9.5
CEO Wage Ratio	52,536	2.024	1.718	4.483	0.996	2.417	0.074	9.002
E-Index	52,536	0.037	0	0.311	0	2	0	5

Table 2: Donating vs Non-Donating Firms

This table shows the summary statistics for subsamples of donors and nondonors in unaffected areas. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Continuous variables are winsorized at the 1% and 99% level, and accounting variables are measured in the year of the disaster. Variable definitions are provided in Appendix A.

	Donors						Nondonors						
Variable	*N*	Mean	Median	SD	Min	Max	*N*	Mean	Median	SD	Min	Max	*Difference*
CAR [-1,+21]	1,219	-0.335	0.001	10.32	-35.20	36.18	51,317	0.006	0.001	17.71	-35.20	36.18	*-0.341*
CAR[-1,+3]	1,219	0.122	0.002	3.929	-10.99	13.61	51,317	0.302	0.001	5.923	-10.99	13.61	*-0.180*
CAR[+3,+21]	1,219	-0.161	0.070	10.96	-36.87	36.61	51,317	-0.161	-0.096	17.85	-36.87	36.61	*0.000*
Disaster Size ($Mil)	1,219	3,508	650	7,609	56	30,000	51,317	4,054	633.5	7,613	56	30,000	*-0.564***
Search Intensity	1,219	3.064	2.891	0.5	0	4.615	51,317	2.973	3.044	0.982	0	4.615	*-0.091****
Small Disaster	1,219	0.295	0	0.456	0	1	51,317	0.272	0	0.445	0	1	*0.023**
Large Disaster	1,219	0.152	0	0.451	0	1	51,317	0.202	0	0.402	0	1	*-0.050****
Total Assets ($Mil)	1,219	88,767	19,014	143,642	34.13	446,333	51,317	20,755	1,260	67,445	0.051	446,333	*68,012****
Market Value ($Mil)	1,219	18,368	2,638	52,674	3.163	399,535	51,317	1,240	232.3	7,370	0.001	790,050	*17,128****
Sales/Assets	1,219	1.081	0.812	0.965	0	4.642	51,317	0.927	0.739	0.828	0	4.642	*0.154****
Intangibles/Assets	1,219	0.118	0.030	0.187	0	0.727	51,317	0.056	0.021	0.108	0	0.727	*0.062****
CapEx/Assets	1,219	0.064	0.044	0.083	0	0.462	51,317	0.045	0.030	0.056	0.001	0.462	*0.018*
ROA	1,219	0.096	0.080	0.080	-0.375	0.346	51,317	-0.036	0.037	0.263	-1	0.346	*0.133****
PPE/Assets	1,219	0.385	0.301	0.296	0.001	0.982	51,317	0.259	0.194	0.239	0	0.981	*0.126****
Effective Tax Rate	1,219	0.188	0.142	0.238	-0.318	0.755	51,317	0.135	0.049	0.228	-0.318	0.755	*0.053****
Foreign Activities	1,219	0.558	1	0.497	0	1	51,317	0.444	0	0.496	0	1	*0.114****
SG&A/Assets	1,219	0.215	0.122	0.293	0.005	1.870	51,317	0.283	0.151	0.374	0.005	0.950	*-0.069****
R&D Expenses/Assets	1,219	0.009	0	0.029	0	0.215	51,317	0.015	0	0.042	0	0.211	*-0.006****
Institutional Ownership	1,219	0.498	0.475	0.320	0.001	1	51,317	0.264	0.087	0.330	0	1	*0.226****
MSCI Governance Index	1,099	5.456	5.4	1.717	0.9	9.5	7,906	5.320	5.3	1.593	0	9.5	*0.136****
CEO Wage Ratio	1,219	1.975	2.139	0.941	0.277	3.349	51,317	2.026	1.709	4.573	0.074	9.002	*-0.052*
E-Index	1,219	0.872	2	1.221	0	5	51,317	0.018	0	0.216	0	5	*0.855****

Table 3: Main Results – Firm CARs around Disaster Relief Donations

This table shows OLS estimations where the dependent variable is the firm-level CAR around a disaster. The main explanatory variable is an indicator for whether an unaffected firm provides a disaster-specific donation (*Disaster Relief Donation*) in Panel A, interacted with measures of disaster size (l*n(Disaster Size),* Search Intensity *(ln (Web Search Intensity)), Small Disaster, Large Disaster*) in Panel B. In Panel A, the dependent variable is the firm's [-1,+21]-day CAR around the disaster in Columns (1) and (4), [-1,+3]-day CAR in Column (2), and [+3,+21]-day car in Column (3). In Panel B, the dependent variable is the [-1,+21]-day CAR. All specifications include a set of control variables (indicator for foreign activities, ROA, PPE/Assets, firm size, and the firm's effective tax rate) as well as country × year FE, industry × year FE, and firm district FE, plus firm FEs in Column (4) of Panel A. Definitions of all variables are in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Market Reactions to Disaster Relief Donations

Dep. Var.:	(1) CAR[-1,+21]	(2) CAR[-1,+3]	(3) CAR[+3,+21]	(4) CAR[-1,+21]
Disaster Relief Donation	-1.352**	-0.478***	-4.673**	-1.984***
	(0.613)	(0.155)	(2.062)	(0.483)
Foreign Activities	0.040	-0.055	-0.165	0.504
	(0.152)	(0.047)	(0.203)	(0.317)
ROA	0.809	1.424***	-1.743***	-1.318
	(1.191)	(0.185)	(0.643)	(0.997)
PPE/Assets	-0.069	-0.173***	0.118	0.431***
	(0.098)	(0.025)	(0.098)	(0.114)
Size	-0.069	-0.173***	0.117	0.431***
	(0.097)	(0.025)	(0.097)	(0.114)
Effective Tax Rate	-0.212	0.069	-2.024	0.529
	(0.669)	(0.159)	(1.342)	(0.449)
Country × Year FE	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Firm FE	No	No	No	Yes
Observations	52,536	52,536	52,536	45,046
R-squared	0.129	0.099	0.071	0.328

Panel B: Disaster Salience

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
Disaster Relief Donation	-9.139***	-6.722**	0.136	-1.774**
	(2.283)	(2.939)	(0.718)	(0.810)
ln(Disaster Size)	-0.000			
	(0.042)			
Disaster Relief Donation × ln (Disaster Size)	0.560***			
	(0.130)			
ln(Web Search Intensity)		0.244		
		(0.148)		
Disaster Relief Donation × ln (Web Search Intensity)		1.696**		
		(0.742)		
Small Disaster			0.075	
			(0.218)	
Disaster Relief Donation × Small Disaster			-6.886***	
			(0.685)	
Large Disaster				0.050
				(0.157)
Disaster Relief Donation × Large Disaster				1.829***
				(0.607)
Control Variables	Yes	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Observations	52,536	52,536	52,536	52,536
R-squared	0.129	0.129	0.129	0.129

Table 4: Two-Stage Least-Square Test using Disaster Timing as IV

This table shows results for a two-stage least-square test using an indicator for the disaster occurring in the first three months of the firm's fiscal year (*Early Disaster*) as an instrument for a firm's decision to donate (*Disaster Relief Donation*). Columns (1) and (2) show the first-stage results of Probit models regressing *Disaster Relief Donation* on *Early Disaster* (column (1)) and *Disaster Relief Donation* × *Large Disaster* on *Early Disaster* × *Large Disaster* (column (2)). Columns (3) and (4) show second-stage results where the dependent variable is the firm's [-1,+21]-day CARs, regressed on the predicted donation likelihoods (*P(Disaster Relief Donation)* and *P(Disaster Relief Donation)* × *Large Disaster*) from the first stage estimations in columns (1) and (2). All specifications control for foreign activities, ROA, PPE/Assets, firm size, the firm's effective tax rate, and disaster type, as well as industry × year FE, and firm district FE. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)
Dep. Var.:	Disaster Relief Donation	Disaster Relief Donation × Large Disaster	CAR[-1,+21]	CAR[-1,+21]
	1st Stage		*2nd Stage*	*2nd Stage*
Early Disaster	1.179***			
	(0.154)			
Early Disaster × Large Disaster		1.341***		
		(0.047)		
P(Disaster Relief Donation)			-6.304*	-7.664*
			(3.751)	(4.191)
Large Disaster				0.189
				(0.235)
P(Disaster Relief Donation) × Large Disaster				6.758**
				(3.302)
Control Variables	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Observations	52,536	52,536	52,536	52,536
F-Statistic (IV)	266.83	410.13	N/A	N/A

Table 5: Abnormal Returns around Donation Announcement Dates

This table reports the results of OLS estimations where the dependent variable is the [-1,+1]-day CARs for unaffected firms around disaster relief donation announcements in media articles and press releases for which we can find information online (in English). The sample consists of a nearest-neighbourhood matched sample of donating and non-donating firms, matched on country, industry, size, foreign activities, ROA, PPE/Assets, and tax rate. The main independent variables are an indicator for whether the firm donated (*Disaster Relief Donation,* column (1)), interacted with an indicator for whether the CEO's name is mentioned in the announcement (*CEO Name*, column (2)), disaster size in terms of dollar damage caused (*ln(Disaster Size)*, column (3)), the disaster's search intensity (*ln(Web Search Intensity)*, column (4)), and an indicator for large disasters (*Large Disaster*, column (5)), All specifications include a set of control variables (foreign activities, size, ROA. PPE/Assets, and effective tax rate) as well as country, industry, and year fixed effects. Definitions of all variables are in Appendix A. Standard errors are clustered by firm district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dep. Var.: CAR[-1,+1]	(1)	(2)	(3)	(4)	(5)
Disaster Relief Donation	0.646*	0.288	-3.828**	-0.778	0.288
	(0.339)	(0.218)	(1.455)	(0.635)	(0.218)
Disaster Relief Donation × CEO Name		-0.254*			
		(0.149)			
ln (Disaster Size)			-0.265		
			(0.194)		
Disaster Relief Donation × ln (Disaster Size)			0.362*		
			(0.187)		
ln (Web Search Intensity)				-0.156	
				(0.437)	
Disaster Relief Donation × ln (Web Search Intensity)				1.139**	
				(0.427)	
Large Disaster					-0.054
					(0.404)
Disaster Relief Donation × Large Disaster					1.145*
					(0.605)
Control Variables	Yes	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	1,282	1,282	1,282	1,282	1,282
R-squared	0.147	0.149	0.208	0.060	0.149

Table 6: Distinguishing Strategic Benefits, Agency Costs, and Tax Incentives

Panel A reports the results of regressing unaffected firms' [-1,+21]-day CARs around sudden disasters on an indicator for disaster-specific donations (*Disaster Relief Donation*) interacted with indicators for domestic-focused firms in column (1), high SG&A expenses in column (2), high R&D expenses in column (3), and being in regulated industries in column (4). Panel B interacts *Disaster Relief Donation* with indicators for a. below-average MSCI governance index in column (1), bottom-quartile institutional ownership in column (2), proxies for CEO power (high CEO wage ratio) in column (3), and the E-Index in column (4). Panel C reports the results of interacting *Disaster Relief Donation* with the firm's effective tax rate for the full sample in column (1), for a subsample of firms with negative effective tax rates in column (2), and for a subsample of firms with effective tax rates > 35% in column (3). All specifications control for foreign activities, ROA, PPE/Assets, firm size, and the effective tax rate as well as country × year FE, industry × year FE, and firm district FE. The sample in column (1) of Panel B is limited to firms with data availability in MSCI. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Strategic Philanthropy Proxies

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
Disaster Relief Donation	-2.110**	-2.214***	-1.539**	-1.449**
	(0.876)	(0.414)	(0.648)	(0.600)
Domestic Focus	-0.051			
	(0.103)			
Disaster Relief Donation × Domestic Focus	1.228**			
	(0.583)			
High SG&A Expenses		0.165		
		(0.183)		
Disaster Relief Donation × High SG&A Expenses		2.050*		
		(1.110)		
High R&D Expenses			-0.423	
			(0.277)	
Disaster Relief Donation × High R&D Expenses			4.506***	
			(0.493)	
Disaster Relief Donation × Regulated Industry				1.015*
				(0.589)
Control Variables	Yes	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Observations	52,536	52,536	52,536	52,536
R-squared	0.129	0.129	0.129	0.123

Table 6 (Continued): Distinguishing Strategic Benefits, Agency Costs, and Tax Incentives

Panel B: Agency Proxies

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
Disaster Relief Donation	1.008	-1.065*	-5.770***	-0.935***
	(0.866)	(0.617)	(1.797)	(0.263)
Low Governance Index	0.368			
	(0.331)			
Disaster Relief Donation × Low Governance Index	-2.356*			
	(1.327)			
Low Institutional Ownership		0.054		
		(0.182)		
Disaster Relief Donation × Low Institutional Ownership		-6.627**		
		(2.686)		
High CEO Wage Ratio			-0.569	
			(0.810)	
Disaster Relief Donation × High CEO Wage Ratio			-6.562***	
			(1.804)	
E-Index				0.260***
				(0.075)
Disaster Relief Donation × E-Index				-0.412**
				(0.166)
Control Variables	Yes	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Observations	8.457	52,536	52,536	52,536
R-squared	0.156	0.129	0.129	0.028

Panel C: Tax Incentives

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)
Sample	*All*	*Effective Tax Rate ≤ 0*	*Effective Tax Rate > 35%*
Disaster Relief Donation	-1.669***	0.033	1.500*
	(0.588)	(0.471)	(0.755)
Effective Tax Rate	-0.233		
	(0.683)		
Disaster Relief Donation × Effective Tax Rate	3.123**		
	(1.532)		
Control variables	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
Observations	52,536	21,132	7,836
R-squared	0.129	0.081	0.232

Table 7: Testing the Mechanisms

This table shows OLS results where the dependent variable is the percentage change in monthly Google searches for the firm's name from the month before the disaster to the disaster month (column (1)), the percentage increase in domestic sales growth from the year before the disaster to the year after the disaster (column (2)), the percentage change in the employee satisfaction score in Refinitiv ESG ratings from the year before the disaster to the disaster year (column (3)), an indicator for whether the firm receives a CSR award in the year of the disaster (column (4)), and an indicator for whether there is an increase in analyst recommendation for the company in the year of the disaster (column (5)). In all panels, the main independent variable is an indicator for whether the firm provided disaster relief donations (*Disaster Relief Donation*), interacted with an indicator for large disasters (*Large Disaster)*. All specifications include control variables (foreign activities, ROA, PPE/Assets, firm size, and the firm's effective tax rate) as well as country × year FE, industry × year FE, and firm district FE (country and industry FEs in column (3)). Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Dep. Var.:	*% Change in Firm Web Searches$_{m-1,m}$*	*% Domestic Sales Growth$_{t-1,t}$*	*% Employee Satisfaction Change$_{t-1,t}$*	*CSR Award$_t$*	*Recommendation Increase$_t$*
Disaster Relief Donation	0.083**	0.001	0.009	0.113***	-0.005
	(0.032)	(0.0119)	(0.011)	(0.009)	(0.010)
Large Disaster	-0.042***	0.005	-0.012**	-0.002	-0.010*
	(0.010)	(0.003)	(0.005)	(0.002)	(0.005)
Disaster Relief Donation ×	0.297***	0.030**	0.030**	0.073***	0.111***
Large Disaster	(0.042)	(0.015)	(0.011)	(0.014)	(0.016)
Control Variables	Yes	Yes	Yes	Yes	Yes
Country (× Year) FE	Yes	Yes	Yes	Yes	Yes
Industry (× Year) FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	No	Yes	Yes
Observations	7,911	5,660	126	5,683	14,689
R-squared	0.134	0.420	0.453	0.524	0.166

Appendix A: Variable Definitions

Variable	Definition
CAR[-1,+21]	Cumulative abnormal returns in percent, from days -1 to +21 around the disaster event, where day 0 is the first day the disaster struck, benchmarked relative to the expected CAPM-based market returns of the country's major equity index, calculated over a [-252,-2] estimation window. *Source: CRSP, Compustat, Datastream.*
CAR[-1,+3]	Cumulative abnormal returns in percent, from days -1 to +3 around the disaster event, where day 0 is the first day the disaster struck, benchmarked relative to the expected CAPM-based market returns of the country's major equity index, calculated over a [-252,-2] estimation window. *Source: CRSP, Compustat, Datastream.*
CAR[+3,+21]	Cumulative abnormal returns in percent, from days +3 to +21 around the disaster event, where day 0 is the first day the disaster struck, benchmarked relative to the expected CAPM-based market returns of the country's major equity index, calculated over a [-252,-2] estimation window. *Source: CRSP, Compustat, Datastream.*
CAR[-1,+1]	Cumulative abnormal returns in days -1 to +1 around the disaster relief grant announcement, benchmarked relative to the expected CAPM-based market returns of the country's major equity index, calculated over a [-252,-2] estimation window. *Source: CRSP, Compustat, Datastream.*
Disaster Relief Donation	A dummy equal to one if the firm made donations to recipients in the disaster-affected area around the disaster event, and zero otherwise. *Source: Foundation Maps.*
Size	Firm size calculated as the logarithm of total assets in USD. *Source: Datastream and Compustat Global.*
Total Assets	The firm's total assets in the year of the disaster, in millions of U.S. dollars. *Source: Datastream and Compustat Global.*
Market Value	The market value of the firm, in millions of U.S. dollars. *Source: Datastream, CRSP, and Compustat Global.*
Sales/Assets	The ratio of total sales to total assets in the year of the disaster. *Source: Datastream and Compustat Global.*
Intangibles/Assets	The ratio of intangible assets to total assets in the year of the disaster. *Source: Datastream and Compustat Global.*
CapEx/Assets	The ratio of capital expenditures to total assets in the year of the disaster. *Source: Datastream and Compustat Global.*
ROA	The ratio of EBIT to total assets in the year of the disaster. *Source: Datastream and Compustat Global.*
PPE/Assets	The ratio of property, plants, and equipment to total assets in the year of the disaster. *Source: Datastream and Compustat Global.*
SG&A Expenses/Assets	The ratio of selling, general, and administrative (SG&A) expenses to total assets in the year of the disaster. *Source: Datastream and Compustat Global.*
R&D Expenses/Assets	The ratio of research and development (R&D) expenses to total assets in the year of the disaster. *Source: Datastream and Compustat Global.*
Effective Tax Rate	The firm's total income taxes as a percentage of EBIT. *Source: Datastream and Compustat Global.*
Foreign Activities	A dummy equal to one if the firm has foreign activities outside of its headquarter country, proxied by the presence of foreign currencies on the firm's annual statements. *Source: Datastream and Compustat Global.*
Domestic Focus	A dummy equal to one if the firm has no activities outside of its headquarter country. *Source: Datastream and Compustat Global.*

District FE	A set of dummies equal to one if the firm's headquarters is located in a particular district, county, province, or state. *Source: Datastream and Compustat Global.*
Disaster Size ($Mil)	The total value in damages attributed to the disaster, measured in millions of U.S. dollars. *Source: EM-DAT.*
Small Disaster	A dummy equal to one if the total value in damages attributed to the disaster is smaller than US$2 million (25th percentile). *Source: EM-DAT.*
Large Disaster	A dummy equal to one if the total value in damages attributed to the disaster is larger than US$1.8 billion (75th percentile). *Source: EM-DAT.*
ln (Web Search Intensity)	The natural logarithm of the number of monthly Google searches for disaster-related terms, including "hurricane," "earthquake," "tsunami," "landslide," "cyclone," etc. in the month of the disaster. *Source: Google Trends.*
Early Disaster	A dummy equal to one if the disaster occurred in the first three months of the firm's financial year. *Source: WRDS and EM-DAT.*
Regulated Industry	A dummy equal to one if the firm is in a regulated industry, where regulated industries are Utilities and Communications following Masulis and Reza (2015).
E-Index	Entrenchment index ranging from 0-5, adding one for the presence of a poison pill, supermajority requirement, golden parachute, staggered board, classified board, or limited director liability, respectively. *Source: Refinitiv ESG.*
Low Institutional Ownership	A dummy equal to one if the firm has below-average institutional ownership. *Source: FactSet.*
High CEO Wage Ratio	A dummy equal to one if the ratio of the CEO's total wage to the second highest-paid executive is above the sample average. *Source: ExecuComp.*
Low Governance Index	A dummy equal to one if the firm has a below-average governance index. *Source: MSCI Governance.*
% Domestic Sales Growth	The percentage change in domestic sales from year *t*-1 before the disaster to year *t* (the year the disaster occurred). Source: *Datastream and Compustat.*
% Change in Firm Web Searches	The logarithm of the number of monthly web searches via the Google search engine for the firm's official name in the month of the disaster. *Source: Google Trends.*
% Employee Satisfaction Change	Continuous variable capturing the change in the % employee satisfaction score as reported by the firm, in the year of the disaster relative to the year before. *Source: Refinitiv ESG.*
CSR Award	A dummy equal to one if the firm won a CSR award in the year of the disaster. Source: *Refinitiv ESG.*
Recommendation Increase	A dummy equal to one if the firm's average analyst recommendation increased in the year of the disaster. *Source: I/B/E/S.*
CEO Name	A dummy equal to one if the CEO or another executive is referred to by name in a firm's disaster relief press release or media announcement. *Source: press releases.*

INTERNET APPENDIX

Disaster Relief, Inc.

Appendix IA.A: Disaster Sample Distribution

This table shows the frequency of disasters in our sample by country.

Country	# Disasters	Country	# Disasters
Argentina	1	Italy	13
Australia	11	Japan	41
Austria	1	South Korea	6
Belgium	2	Luxembourg	1
Brazil	3	Mexico	19
Canada	3	Malaysia	1
Switzerland	1	Netherlands	2
Chile	3	Norway	1
China	82	New Zealand	6
Cayman Islands	1	Philippines	25
Czech Republic	1	Poland	1
Germany	6	Portugal	2
Denmark	2	Russia	3
Spain	3	Sweden	1
France	9	Thailand	4
United Kingdom	6	Turkey	5
Greece	2	Taiwan	9
Indonesia	16	United States	58
India	17	South Africa	1
		Total	**330**

Appendix IA.B: Accounting for Cross-Correlation in Returns

To account for potential cross-correlation in returns, we use a portfolio regression analysis following the approach in Campbell et al. (1997) and Eckbo et al. (2021). We construct portfolios for donating and non-donating firms. We find in Panel A of Table IA.B that although the portfolio of donating firms earns negative returns (column (1)), insignificantly different from zero, the portfolio of non-donating firms earns significantly positive returns of +0.47% (column (2)). We then construct a portfolio going long in donating firms and short in non-donating firms and find a significantly negative return of -1.54%. These results are similar to our baseline results in Table 3 in terms of sign, magnitude, and significance. We construct similar portfolios in Panel B, where we further distinguish by disaster size. Confirming our main results, we find that the 21-day return on a long-short portfolio is significantly positive at +2.34% for large disasters, but significantly negative at -1.10% and -2.32% for medium and small disasters, respectively.

Table IA.B: Time-Series Portfolio Regressions

This table reports portfolio regression results accounting for the cross-sectional dependence of returns following the approach outlined in Campbell, Lo, and MacKinlay (1997) and Brown and Warner (1980, 1985), adapted for the event study setting in Kothari and Warner (2006). Daily abnormal returns (ARs) are estimated using the following regression: $r_{pt} = \alpha + ARd_t + \beta r_{wt} + \varepsilon_t$ where r_{pt} is the daily equally-weighted portfolio return for portfolios of donating (column (1)) and non-donating (column (2)) firms, d_t is a dummy variable set equal to one for observations in the event window and zero for observations in the estimation window, and $r_{wt}$is the daily return of the firm's local market index (where local refers to the country where the firm is headquartered). Column (3) in Panel A and columns (1)-(3) in Panel B report returns for a portfolio going long in donating firms and short in non-donating firms. The estimation window consists of the 180 trading days preceding the event window (excluding days that fall in the event window of other events), and every observation must have at least 100 return observations in the estimation period. The 21-day $CAR_{[-1,+20]}$ event window runs from the day before the official disaster start date as recorded in EM-DAT to 20 days after the disaster start date. The $CAR_{[-1,+3]}$ event window runs from one day before to three days after the disaster start date, and the $CAR_{[+3,+20]}$ event window runs from three days after to 20 days after the disaster start date. The cumulative abnormal return is obtained by multiplying the coefficient on AR by the number of days in the event window (e.g. $CAR_{[-1,+20]} = 21AR$). The t-statistics to derive p-values are calculated using the standard error from the regression, e.g. $\sigma_{21AR} = 21\sigma_{AR}$, which accounts for the cross-correlation in returns, as 21AR/σ_{21AR} (following e.g. Eckbo, Nygaard, and Thorburn (2021)). In Panel B, the sample consists of small disaster events in column (1), medium disasters in column (2), and large disasters in column (3). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Full Sample (N=13,687)

	(1) Donating	(2) Non-Donating	(3) Donating – Non-Donating Portfolio
$CAR_{[-1,+20]}$	-0.999	0.474***	-1.538***
	(1.303)	(0.110)	(0.066)
$CAR_{[-1,+3]}$	-0.735	0.209***	-1.111***
	(0.552)	(0.047)	(0.058)
$CAR_{[+3,+20]}$	-0.211	0.246**	-0.370***
	(1.152)	(0.097)	(0.028)

Panel B: Disaster Size

Portfolio Returns Donating – Non-Donating	(1) Small Disasters N=5,504	(2) Medium Disasters N=7,616	(3) Large Disasters N=567
$CAR_{[-1,+20]}$	-2.323***	-1.100***	2.338***
	(0.102)	(0.091)	(0.273)
$CAR_{[-1,+3]}$	-1.056***	0.095**	2.896***
	(0.043)	(0.038)	(0.115)
$CAR_{[+3,+20]}$	-1.159***	-0.969***	-0.742**
	(0.090)	(0.080)	(0.241)

Appendix IA.C: US Firms with and without Indirectly Affected Subsidiaries, Suppliers, Customers

Panel A shows OLS estimations where unaffected firms' [-1,+21]-day CARs around sudden disasters are regressed on an indicator for disaster-specific donations, interacted with proxies for disaster saliency. The table focuses on a subsample of U.S. firms. Proxies for disaster saliency are disaster size and web search intensity in columns (1) and (2), and dummies for small and large disasters in columns (3) and (4). Panel A includes all US firms, Panel B excludes firms with subsidiaries, suppliers, or customers in affected states. All specifications control for foreign activities, ROA, PPE/Assets, firm size, and the effective tax rate as well as year FE, industry × year FE, and state FE. Definitions of all variables are provided in Appendix A and IA.I. Standard errors are clustered by state. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: US Subsample

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
Disaster Relief Donation	-8.170***	-4.186**	0.122	-1.801***
	(1.817)	(1.725)	(0.556)	(0.615)
ln (Disaster Size)	0.000			
	(0.000)			
Disaster Relief Donation × ln (Disaster Size)	0.479***			
	(0.114)			
ln(Web Search Intensity)		0.373		
		(0.344)		
Disaster Relief Donation × ln (Web Search Intensity)		0.876*		
		(0.506)		
Small Disaster			0.116	
			(0.367)	
Small Disaster × Disaster Relief Donation			-10.477***	
			(0.959)	
Large Disaster				-0.156
				(0.129)
Large Disaster × Disaster Relief Donation				1.658***
				(0.465)
Control Variables and FEs	Yes	Yes	Yes	Yes
Observations	21,189	21,189	21,189	21,189
R-squared	0.105	0.105	0.105	0.105

Panel B: Excluding Indirectly Affected US Firms

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
Disaster Relief Donation	-12.905***	-9.215***	1.856***	-1.771***
	(1.793)	(1.059)	(0.601)	(0.595)
ln(Disaster Size)	0.079			
	(0.076)			
Disaster Relief Donation × ln (Disaster Size)	0.811***			
	(0.113)			
ln(Web Search Intensity)		0.665**		
		(0.328)		
Disaster Relief Donation × ln (Web Search Intensity)		2.406***		
		(0.360)		
Small Disaster			-0.234	
			(0.449)	
Disaster Relief Donation × Small Disaster			(0.000)	
			-19.775***	
Large Disaster				0.190
				(0.215)
Disaster Relief Donation × Large Disaster				1.307***
				(0.448)
Control Variables and FEs	Yes	Yes	Yes	Yes
Observations	15,456	15,456	15,456	15,456
R-squared	0.109	0.109	0.109	0.109

Appendix IA.D: Market Efficiency

This table shows OLS estimations where the dependent variable is the firm-level CAR around a disaster, for a subsample of firms with high (above-average) market efficiency in Panel A and firms with low (below-average) market efficiency in Panel B. In both panels, we measure market efficiency as the country-level R^2 in columns (1)-(4) and the firm-level post-earnings announcement drift (PEAD) beta in columns (5)-(8). Due to data availability, columns (5)-(8) are limited to a sample of U.S. firms only. The main explanatory variable is an indicator for whether an unaffected firm provides a disaster-specific donation (*Disaster Relief Donation*), interacted with measures of disaster size (l*n(Disaster Size),* Search Intensity *(ln (Web Search Intensity)), Small Disaster, Large Disaster*). The dependent variable is the firm's [-1,+21]-day CAR around the disaster. All specifications include a set of control variables (indicator for foreign activities, ROA, PPE/Assets, firm size, and the firm's effective tax rate) as well as Country × Year FE, Industry × Year FE, and District × Year FE in columns (1)-(4), and Year, Industry, and State FE in columns (5)-(8). Definitions of all variables are in Appendix A and IA.I. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: High Market Efficiency Subsample

	Country R^2				β_{PEAD}			
Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster Relief Donation	-8.525***	-4.619*	0.147	-1.746**	-0.445	-1.903	1.396***	0.451***
	(2.195)	(2.368)	(0.728)	(0.810)	(1.028)	(1.643)	(0.165)	(0.167)
ln(Disaster Size)	-0.022				0.030			
	(0.057)				(0.075)			
Disaster Relief Donation × ln (Disaster Size)	0.516***				0.125*			
	(0.129)				(0.071)			
ln(Web Search Intensity)		0.425***				-0.493*		
		(0.136)				(0.282)		
Disaster Relief Donation × ln (Web Search Intensity)		1.039*				0.988*		
		(0.573)				(0.540)		
Small Disaster			0.281				-0.338	
			(0.316)				(0.470)	
Disaster Relief Donation × Small Disaster			-6.836***				-0.554**	
			(0.764)				(0.233)	
Large Disaster				-0.149				-0.302
				(0.134)				(0.244)
Disaster Relief Donation × Large Disaster				1.775***				2.981***
				(0.582)				(0.290)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Country ×) Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District (× Year) FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry (× Year) FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	29,124	29,124	29,124	29,124	4,933	4,900	4,933	4,933
R-squared	0.099	0.099	0.099	0.099	0.015	0.044	0.015	0.015
Sample	Full	Full	Full	Full	US	US	US	US

Appendix IA.D (Continued): Market Efficiency

Panel B: Low Market Efficiency Subsample

	Country R^2				β_{PEAD}			
Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Disaster Relief Donation	-5.386	-21.432	2.088	0.954	7.873	7.721	-0.336	0.533
	(10.577)	(13.411)	(2.070)	(1.573)	(5.069)	(4.827)	(1.146)	(1.283)
ln(Disaster Size)	0.047				0.210			
	(0.086)				(0.182)			
Disaster Relief Donation × ln (Disaster Size)	0.469				-0.561			
	(0.822)				(0.342)			
ln(Web Search Intensity)		-0.045				1.318		
		(0.290)				(0.904)		
Disaster Relief Donation × ln (Web Search Intensity)		7.415*				-2.463*		
		(4.106)				(1.365)		
Small Disaster			-0.210				0.192	
			(0.264)				(1.030)	
Disaster Relief Donation × Small Disaster			-4.936**				0.979	
			(1.986)				(3.336)	
Large Disaster				0.448				1.322
				(0.281)				(0.913)
Disaster Relief Donation × Large Disaster				-0.037				-2.563
				(3.531)				(1.636)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
(Country ×) Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District (× Year) FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × (Year) FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	23,257	23,257	23,257	23,257	4,583	4,558	4,583	4,583
R-squared	0.267	0.267	0.267	0.267	0.025	0.029	0.025	0.026
Sample	Full	Full	Full	Full	US	US	US	US

Appendix IA.E: Disaster Timing Statistics

Panel A shows the mean and difference in means for the predicted donation likelihood around large disasters occurring in the first three months of the fiscal year (*Early Disaster*) versus other months (*Other Timing)*. Panel B shows firm characteristic summary statistics for subsamples of disaster-firm observations where the disaster occurred in the first three months of the firm's financial year and for those where the disaster occurred at other times in the year. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Continuous variables are winsorized at the 1% and 99% levels, and accounting variables are measured in the year of the disaster. Variable definitions are provided in Appendix Table A and IA.I.

Panel A: Donation Likelihood for Large Disasters

Sample	*Early Disaster*	*Other Timing*	*Difference*
Donation Likelihood	2.35%	1.39%	*0.95%****

Panel B: Firm Characteristics

Variable	*Mean*	*Mean*	*Difference*
Sample	*Early Disaster*	*Other Timing*	
Market Value ($Mil)	1,634.15	1,638.77	4.613
Sales Growth	0.107	0.110	0.003
ROA	-0.035	-0.033	0.002
Effective Tax Rate	0.137	0.136	0.001
Affected Supply Chain	0.025	0.025	0.000

Appendix IA.F: Instrumental Variable Approach – Robustness Tests

Panel A shows the results of robustness tests for the two-stage test in Table 4, where in the first stage, the *Disaster Relief Donation* dummy is instrumented with *Early Disaster*, and the interaction *Disaster Relief Donation* × *Large Disaster* is instrumented with the interaction *Early Disaster* × *Large Disaster*. Additional second-stage estimations are reported in column (1), where the dependent variable is the [-1,+21]-day CARs and the sample excludes tropical storms and tropical cyclones, and in column (2), where the outcome variable is the firm's CARs over a [-30,-1] window before the disaster as a placebo test. Panel B shows first-stage (columns (1) and (2)) and second-stage (column (3)) results using a firm's geographic proximity to the disaster zone (in deciles, where a higher decile indicates a smaller distance) as the instrument for donating. In column (4), the sample is limited to US firms, excluding those with subsidiaries, suppliers, or customers in affected states. All specifications control for foreign activities, ROA, PPE/Assets, firm size, and the firm's effective tax rate, as well as country × year FE (excluded in Panel A and in column (4) of Panel B), industry × year FE, and firm district FEs. Panel A additionally controls for disaster type. Standard errors are clustered by firm district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Disaster Timing Robustness Tests

	(1)	(2)
Dep. Var.:	CAR[-1,+21]	CAR[-30,-1]
	2nd Stage: Excl. Tropical Storms	*2nd Stage: Placebo*
P(Disaster Relief Donation)	-5.329*	7.498
	(2.792)	(13.70)
Large Disaster	0.146	-2.068
	(0.187)	(0.8)
P(Disaster Relief Donation) × Large Disaster	4.263*	-9.821
	(2.560)	(16.60)
Observations	52,536	31,406
F-Stat (IV)	259.89	250.62
Control Variables and FEs	Yes	Yes

Panel B: Geographic Proximity Instrument

	(1)	(2)	(3)	(4)
Dep. Var.:	Disaster Relief Donation	Disaster Relief Donation × Large Disaster	CAR[-1,+21]	CAR[-1,+21]
	1st Stage		*2nd Stage*	*Excl. Indir. Aff.*
Geographic Proximity	0.0002***			
	(0.000)			
Geographic Proximity × Large Disaster		0.0003**		
		(0.0001)		
P(Disaster Relief Donation)			-3.944***	-14.333**
			(0.304)	(5.706)
Large Disaster			-0.016***	-0.086**
			(0.003)	(0.039)
P(Disaster Relief Donation) × Large Disaster			0.748***	12.801*
			(0.224)	(7.367)
Observations	25,197	25,197	25,197	13,745
F-Stat (IV)	521.14	521.14	521.14	242.88
Control Variables and FEs	Yes	Yes	Yes	Yes

Appendix IA.G: Donation-Level Characteristics

We also examine the role of donation-specific characteristics, such as donation size. On the one hand, donating large amounts of cash to disaster relief can decrease shareholder value if the costs of reduced cash reserves outweigh the benefits. Shareholders may view such donations as reflecting severe agency problems of "doing good with other people's money". On the other hand, large donations can have more strategic value for the firm if they attract more media and investor attention (Harris et al., 2021) and if they are perceived to achieve a larger social impact. Similarly, a firm donating an amount perceived to be disappointingly small may face public outrage, which may negatively affect its reputation and sales. In other words, the relation between donated amount and shareholder value is not necessarily linear, as small donations may disappoint the public, whereas donations that are overly large may disappoint shareholders.

To test the effect of donation size, we regress CARs on the donated amount as a fraction of firm assets. Due to data limitations in Foundation Maps, our sample shrinks to 325 firm-disaster level observations. We find in column (1) of Table IA.G that every percentage point increase in the donated amount decreases CARs by 0.63%. We find in column (2) that there is indeed a quadratic, concave relation between donation amount and shareholder value, with higher returns for medium-sized donations but lower returns for small and large amounts. Firms therefore face a trade-off between public and shareholder sentiment, reflected in the concave relation between donation size and firm value.

The type of donation, notably cash donations versus in-kind donations, can also influence the cost-benefit tradeoff of giving (Seifert et al., 2003). Cash donations directly reduce the firm's liquid resources and can be used by managers to tunnel money to affiliated charities. Conversely, in-kind donations, in which firms donate products or equipment, enable firms to reduce excess inventories or written-off equipment and may be perceived as active firm participation in relief efforts (Madsen and Rodgers, 2014). In column (3), we find that whereas cash donations reduce CARs by 1.36%, in-kind donations increase returns by 1.16% (= 2.52% - 1.36%) relative to not donating.

Table IA.G: Donation-Level Characteristics

This table shows OLS estimations where the dependent variable is the firm's [-1,+21]-day CAR following a sudden disaster, for a sample of firms in unaffected areas. The main explanatory variable(s) in column (1) is the ratio of disaster-specific donations/assets, as well as its squared term in column (2). The sample is limited to firms with data availability for exact donation amount in columns (1) and (2) (for donating firms only). The main explanatory variable in column (3) is a binary indicator for whether the firm provides disaster-specific donations (*Disaster Relief Donation*), interacted with an indicator for in-kind donations (*Donated Products*). The sample in columns (3) is the full sample as specified in our main results in Table 3. All specifications include a set of control variables (indicator for foreign activities, ROA, PPE/Assets, firm size, and the firm's effective tax rate) as well as country × year FE and industry × year FE. Column (3) additionally includes firm district FE. Definitions of all variables are provided in Appendix A and IA.I. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Donation Size		Donation Type
Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)
Donations/Assets %	-0.634***	8.419***	
	(0.094)	(1.190)	
(Donations/Assets %)^2		-0.180***	
		(0.022)	
Disaster Relief Donation			-1.360*
			(0.703)
Disaster Relief Donation × Donated Products			2.519***
			(0.856)
Control variables	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes
District FE	No	No	Yes
Observations	325	325	52,536
R-squared	0.307	0.340	0.129

Appendix IA.H: Robustness Tests

We further verify that our results are driven by the relative strength of strategic philanthropy and agency-motivated giving by investigating the role of ownership structure in terms of family ownership and institutional ownership. In family firms, insiders have few incentives to tunnel corporate funds to affiliated charities. Similarly, firms with higher levels of institutional ownership are often better governed and better monitored, reducing the potential for agency-motivated giving. Consistent with the notion that family firms' donations are unlikely to be agency-motivated, we find in column (1) of Table IA.H1 that returns increase by 1.12% (= 0.70% + 0.42%) for donating family firms. In addition, we show in column (2) that in firms with high levels of institutional ownership, the negative effect of donating is almost completely offset. We find in column (3) that domestic institutional owners view disaster relief giving more favorably, as they are more invested in the local community than foreign owners: donors with higher percentages of domestic institutional ownership earn 0.28% higher returns relative to nondonors. These results indicate that, in firms where agency problems are weaker, donating earns significantly positive returns, consistent with strategic philanthropy becoming dominant.

We perform additional robustness tests and report their results in Table IA.H2. First, due to the coverage of Foundation Maps and disaster frequency in the U.S., a large fraction of our sample consists of U.S.-based firms, which may drive our results. In columns (1) and (2), we split the sample into U.S. and non-U.S. firms. Our findings are sustained for both subsamples, with the returns from donating turning a significantly positive 4.04% (= 5.07% - 1.03%) for non-U.S. firms. This suggests that agency-motivated giving may be more prevalent in the U.S., highlighting the importance of an international study on corporate giving.

Second, we try to rule out other unobservable drivers at the disaster, industry, and firm levels. We first focus on long-term disasters such as droughts, floods, and heat waves. Because firms are unlikely to donate in the [-1, +21]-day window following the start of a long-term disaster, we should not expect to see abnormal returns in this window. This is confirmed by the insignificant coefficients in column (3). In column (4), we exclude firms that have their main exchange listing outside of the headquarter country (4% of the sample), as a domestic disaster should be less salient to international investors. We again find that our results remain. We next want to ensure we capture firms' disaster-specific philanthropy, rather than their overall donating behavior. We consider whether the firm engaged in non-disaster related philanthropy in the disaster year (proxied by firms' annual giving) and find in column (5) that market reactions are driven only by firms' disaster-specific giving. Next, we investigate whether firms' disaster relief giving is unanticipated, as market reactions should be stronger for unexpected donations. We compare donating firms that did not donate to the last large disaster in the firm's country to firms that donated for both disasters and find in column (6) that returns are driven by unexpected disaster relief giving.

We then investigate whether the firm's supply chain was directly affected by the disaster in the spirit of Barrot and Sauvagnat (2016). We find that returns are less negative for donating firms with an affected customer or supplier, consistent with the disaster being more salient to firms that are directly or indirectly affected (column (7)). We further test whether more environmentally conscious firms benefit more from donating to climate-related disasters in column (8), where we consider firms' environmental performance score in terms of emissions reductions, resource reductions, and environmental R&D. Our sample size is reduced to 785 observations due to data coverage. We find that every unit increase in the environmental score (ranging from -50 to +50) increases returns from donating by 0.035%, suggesting that the market perceives donations by less environment-friendly firms as less legitimate, limiting their strategic benefits.

Table IA.H1: Testing the Effect of Family and Institutional Ownership

This table reports the results of regressing unaffected donating firms' [-1,+21]-day CARs around sudden disasters on a binary indicator for disaster-specific donations (*Disaster Relief Donation*), interacted with an indicator for family firms (column (1)), an indicator for high total institutional ownership (column (2)), and an indicator for higher domestic institutional ownership than foreign institutional ownership (column (3)). The sample in all columns is limited to firms with FactSet ownership coverage. All specifications include control variables (indicator for foreign activities, ROA, PPE/Assets, firm size, and the effective tax rate) as well as country × year FE (country FE in column (1)), industry × year FE (industry FE in column (1)), and firm district FE (plus year FE in column (1)). Definitions of all variables are provided in Appendix A and IA.I. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)
Disaster Relief Donation	0.701*	-6.257**	-4.234*
	(0.356)	(2.737)	(2.472)
Family Firm	0.131		
	(0.179)		
Disaster Relief Donation × Family Firm	0.424**		
	(0.197)		
High Institutional Ownership		-0.626*	
		(0.345)	
Disaster Relief Donation × High Institutional Ownership		6.540***	
		(2.535)	
% Domestic > % Foreign Inst. Ownership			-0.265
			(0.514)
Disaster Relief Donation × % Domestic > % Foreign Inst. Ownership			4.510**
			(2.306)
Control Variables	Yes	Yes	Yes
Country (× Year) Fixed Effects	Yes	Yes	Yes
Industry (× Year) Fixed Effects	Yes	Yes	Yes
District Fixed Effects	Yes	Yes	Yes
Observations	3,377	21,112	21,112
R-squared	0.101	0.223	0.222

Table IA.H2: Other Robustness Tests

This table shows OLS estimations where the dependent variable is the firm's [-1,+21]-day CAR following a disaster. The main explanatory variable is the binary indicator *Disaster Relief Donation*, interacted with an indicator for large disasters (*Large Disaster*) in columns (1)-(4). The sample consists of US firms in column (1), non-US firms in column (2), long-term (LT) disasters only in column (3), and firms with a domestic main exchange listing in column (4). The other columns consist of the main sample of sudden disasters. The indicator variable *Disaster Relief Donation* is interacted with the firm's non-disaster specific donations (Annual Donations) in column (5), with an indicator for unanticipated donations (*Unanticipated Donor*) in column (6), with an indicator for having a customer or supplier in an affected area (*Affected Supply Chain*) in column (7), and with the firm's environmental score (ranging from -50 to +50) in column (8). All specifications include controls for foreign activities, ROA, PPE/Assets, firm size, and the firm's effective tax rate, as well as country × year FE, industry × year FE, and firm district FE. Definitions of all variables are provided in Appendix A and IA.I. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Dep. Var.: CAR[-1,+21]	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Sample	*US Firms*	*Non-US Firms*	*LT Dis. Only*	*Domestic Listing*	*Sudden Dis.*	*Sudden Dis.*	*FactSet Coverage*	*Refinitiv ESG Coverage*
Disaster Relief Donation	-1.801***	-1.032**	-0.359	-1.692**	-1.398*	-0.536	-1.469***	-4.247***
	(0.615)	(0.516)	(1.313)	(0.769)	(0.775)	(0.697)	(0.566)	(0.003)
Large Disaster	-0.156	0.141	1.229	0.020				
	(0.129)	(0.234)	(1.841)	(0.158)				
Disaster Relief Donation × Large Disaster	1.658***	5.068***	2.048	1.793***				
	(0.465)	(0.493)	(1.916)	(0.564)				
Annual Donations					-0.115			
					(0.266)			
Disaster Relief Donation × Annual Donations					0.220			
					(0.531)			
Unanticipated Donor						-1.367***		
						(0.424)		
Affected Supply Chain							0.199	
							(0.207)	
Disaster Relief Donation × Affected Supply Chain							1.101**	
							(0.508)	
Environmental Score								-0.009
								(0.025)
Disaster Relief Donation × Environmental Score								0.035**
								(0.0133)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country × Year	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	21,189	31,317	158,028	50,175	52,536	52,536	21,189	785
R-squared	0.105	0.220	0.047	0.122	0.129	0.129	0.105	0.324

Appendix IA.I: Variable Definitions

Variable	Definition
Country R^2	The country-level R^2 of the country where the firm's headquarters is located. *Source: Eun et al. (2015)*
β_{PEAD}	The beta for the standardized unexpected earnings (SUE) obtained from regressing a firm's cumulative abnormal stock returns from day t+3 to day t+63 following an earnings announcement on the SUE of the announcement, for all of the firm's earnings announcements made in the 24 to 2 months prior to a disaster. SUE is calculated as the difference between the mean analyst earnings estimate and the firm's actual earnings, scaled by the stock price 6 to 12 days prior to the earnings announcement. *Source: IBES.*
Affected Supply Chain	Dummy equal to one if a firm in an unaffected zip code has a customer or supplier in an affected zip code. *Source: FactSet Revere and Dai, Liang, and Ng (2021).*
Geographic Distance	The distance between the firm's headquarters and the disaster zone, divided in deciles, where a higher decile indicates a smaller distance. *Source: EM-DAT and Compustat Global.*
Donations/Assets	The ratio of disaster-specific donations to total assets if the firm donated, left missing otherwise. *Source: Foundation Maps.*
Donated Products	A dummy equal to one if the firm only made in-kind donations consisting of donated products or donated equipment, and zero otherwise. *Source: Foundation Maps.*
Family Firm	A dummy equal to one if the firm is a family firm. A firm is defined as a family firm if its largest shareholder or ultimate shareholder is a family, or its CEO or Chairman is the founder or a descendant of the founding family. *Source: NRG Metrics.*
High Institutional Ownership	A dummy equal to one if the firm has above-average institutional ownership. *Source: FactSet.*
% Domestic > % Foreign Inst. Ownership	A dummy equal to one if the percentage of domestic institutional owners is larger than the percentage of foreign institutional owners. *Source: FactSet.*
Annual Donations	A dummy equal to one if the firm has made donations in the year of the disaster, where donations are not necessarily specific to the disaster, and zero otherwise. *Source: Refinitiv ESG.*
Unanticipated Donor	A dummy equal to one if the firm did not donate for the previous large disaster in the country but does donate for the current disaster. *Source: Foundation Maps.*
Environmental Score	A firm's environmental score, capturing the firm's performance in terms of emissions reductions, resource reduction, and environmental R&D, relative to its industry peers. The score ranges from -50 to +50, with 0 being the industry average. *Source: Refinitiv ESG.*