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Disaster Relief, Inc

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We have benefited from conversations with Jianfeng Hu, Alexander Ljunqvist, Roger Loh, Michael Weisbach, Gloria Yu, Joe Zhang, as well as seminar participants at FIRN, Asia-Pacific Corporate Finance Online Workshop, Fordham University, Singapore Management University, and University of New South Wales.

Abstract

We investigate the motivations and value implications of corporate philanthropy by exploiting a global sample of publicly listed firms from 45 countries that provide disaster-relief grants to affected communities. We argue that, while in general corporate philanthropy entails agency concerns, the saliency of large, attention-grabbing natural disasters amplifies the strategic benefits of donating. We find that the returns from donating increase with disaster severity and become positive for firms that rely more on reputation and social image. Returns are also higher for countries with low government relief support, for medium-sized donations, and for in-kind donations. Overall, our results highlight the strategic role of corporate philanthropy, which can lead to net increases in firm value and societal welfare if the strategic benefits of donating are sufficiently large.

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

JEL Classifications: G32, G34, L21, M14

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Disaster Relief, Inc.

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Abstract

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Disaster Relief, Inc.

A fundamental question in economics and finance is why companies give to charity. Corporate philanthropy is increasingly popular across the world, with giving by corporations amounting to more than $20 billion in 2018 in the United States alone.[2] Its roots can be traced back to the 17th century when the first modern corporations were established in Europe. For example, every buyer and seller that transacted with the Dutch trading company *Compagnie van 's Gravenhage* entered a contract that required that person to pay up to 15% of the total transport cost in support of the poor people of the Dutch Republic. However, standard economic theory predicts that corporate philanthropy should be uncommon (Benabou and Tirole, 2010; Kitzmueller and Shimshack, 2012). According to neoliberal economists, such as Milton Friedman and Friedrich Hayek, the prime function of any business enterprise is to generate profits, and its central responsibility is to its shareholders, not the community. The idea that businesses should also seek to perform social tasks is regarded as irrational: Friedman (1970) forcefully argued that corporations should not engage in charity on behalf of shareholders and employees.

One obvious economic reason for firms to engage in philanthropy is to enjoy tax benefits. Donations are tax deductible in most jurisdictions, and the deductible amount can be a multiple of the donated amount. However, the cash flows created through a donation tax shield are typically lower than the donated amount, and many firms support charitable causes to a larger extent than can be explained by tax motivations (Navarro, 1988). Corporations frequently donate millions of dollars in cash or resources to charities, particularly in the context of disasters: the COVID-19 crisis alone has so far resulted in corporate donations of over $7.8 billion USD worldwide.[3] Given the enormous amounts of money spent on charitable giving, it is worth asking what firms' incentives to donate are as well as what the value implications to shareholders are. Yet, these issues remain underexplored in the literature.

[2] Source: Giving USA 2019.
[3] Source: Candid. https://candid.org/explore-issues/coronavirus, as of July 2nd, 2020.

At first sight, corporate philanthropy is inconsistent with shareholder wealth maximization: giving away cash or assets contradicts with the profit-making purpose of a company. Moreover, charitable giving can be used to secure private benefits for insiders (e.g., by donating to affiliated charities and institutions), and it can indirectly manifest deeper agency issues in the firm (Masulis and Reza, 2015, 2020). It may even lead to societal costs by lowering tax revenues and distorting resource allocations in the case of politically motivated donations. However, corporate philanthropy can also bring reputational benefits to firms. Under the "doing well by doing good" view of corporate philanthropy, firms can use corporate giving as a marketing and reputation-building tool to help build social capital with stakeholders or attract new clients and capital (Navarro, 1988; Madsen and Rodgers, 2014). Under this view, corporate philanthropy can enhance firm value by increasing sales and financial performance.

Disentangling these views is not a straightforward exercise. They are often contested in the literature and have received mixed empirical support. This is at least partly driven by the endogenous nature of philanthropic giving and the lack of detailed data on firms' giving. The decision to donate is not a random choice. 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. Moreover, donations made by a firm are generally disclosed in the annual report, together with a broad range of information on nonphilanthropic activities, accounting data, firm performance, etc. Research has therefore been unable to directly investigate the market value implications of corporate giving.

In this paper, we address these challenges by exploiting corporate giving in the context of natural disasters. Natural disasters are exogenous shocks that amplify the benefits of corporate giving to shareholders and other stakeholders. Specifically, large natural disasters attract extensive media coverage, and this increased investor and customer awareness amplifies the social capital- and reputation-building effects of corporate giving (Servaes and Tamayo, 2014). In contrast to other types of corporate giving, disaster-relief donations are typically disclosed in highly visible announcements made in the days and weeks following a disaster. This enables the use of an event-study approach investigating the stock market reaction around the disaster and the donation announcement to directly capture investors' perception of

corporate disaster-relief giving. If attention increases with disaster saliency, market reactions to corporate giving are more likely to reflect the strategic benefits of donating for larger, salient events. We investigate this hypothesis by calculating the cumulative abnormal returns (CARs) around disaster-relief giving. We focus primarily on firms located in cities not directly affected by the disaster to avoid capturing the direct effect of the disaster on firms' operations and performance.

The extent to which CARs reflect strategic philanthropy largely depends on two factors: the saliency of the disaster and the relative importance of reputation and social image to the firm. Larger, more severe disasters attract more news coverage and stakeholder attention and increase the perceived legitimacy of using corporate funds to provide relief. Because reputational and social benefits are amplified, firms can then gain more from charitable activities, such as donating, in the context of larger, more salient events (Madsen and Rodgers, 2014).

Firms that rely more on stakeholder support and reputation in their day-to-day activities can also gain more from building their social capital through disaster-relief donations (Servaes and Tamayo, 2014). Market reactions should therefore be higher for donations by more stakeholder- and marketing-oriented firms. Our analysis will exploit differences in the nature and severity of disasters, the form and amount of disaster relief, and various firm-, industry-, and country-level proxies for social image and perceived legitimacy to investigate the cost-benefit trade-off of corporate philanthropy.

Based on a large international sample of 28,332 firms across 45 countries over the period of 2006–2018, we find that corporate disaster-relief giving by firms in unaffected areas results in 0.50% lower cumulative abnormal returns (CARs) in the 23-day window following the disaster. This suggests that on average the strategic benefits of disaster-relief giving do not outweigh the costs associated with potential agency concerns. However, consistent with the strategic philanthropy view, we find that returns increase as disaster saliency increases. We proxy for saliency by measuring disaster severity (in terms of damage and deaths caused) and relevance (in terms of web search intensity). Every percentage point increase in disaster severity and search intensity increases the returns from donating by 0.6% and 1.7%, respectively. Importantly, these effects are driven by sudden, unanticipated disasters, such as earthquakes, flash floods,

tropical cyclones, landslides, volcanic eruptions, and tsunamis, rather than by non-immediate events, such droughts or extreme heat or cold waves.

Strategic philanthropy also becomes more important for firms that rely more on their reputation and social image. We find that returns are 1.2% to 4.5% higher for donating firms with more domestically oriented operations and for those that rely more on marketing in their day-to-day operations. The returns from donating also become positive for firms in positively affected industries, such as construction, health, and legal services, and for firms in more competitive industries. Local institutions affect returns of donating firms to the extent that they capture government involvement in disaster relief. Returns are 2.2% to 6.3% lower for donating firms located in countries where governments and institutions provide more disaster-relief funding, as more government involvement reduces the legitimacy of corporate giving. At the same time, firms can benefit more from building stakeholder support in more religious countries, where returns from donating are on average 1.2% higher.

Our main analysis is based on the assumption that firms announce their disaster-relief donations in the three weeks following the disaster. Nevertheless, this event window may capture market reactions to other indirect effects of the disaster on the firm's operations or its stakeholders, even for firms in unaffected areas. We therefore manually collect information on announcement dates of press releases and newspaper articles on firms' disaster-relief grants. The results on three-day CARs around donation announcements confirm our main findings: returns are significantly higher for donations made following more salient disasters and for firms that rely more on their social image.

A potential concern is that a disaster-relief setting also increases agency motives of donating by providing legitimacy for managers' affiliated donations or by enabling managers to boost their reputations at the expense of the company and its shareholders. Although increased public attention limits the scope of managerial self-dealing (e.g., donating to affiliated charities), it may amplify incentives to donate for personal reasons, that is, for doing good with other people's money. We investigate the personal-reputation channel by investigating whether the CEO's name is mentioned in press releases and the affiliated-donations channel by investigating whether donations were made to reputable NGOs. We find no evidence

for the reputation and affiliated-donation channels for the average disaster-relief donation, but returns are significantly negative for reputation-motivated and non-NGO donations by poorly governed firms.

We further address the potential increase in agency costs by considering the donation amount and type. We find that excessively large donations and cash donations (which are more likely to be motivated by managerial private benefits) are both associated with more negative returns. This effect becomes considerably stronger if the CEO is featured in the firm's disaster-relief press release. However, returns are positive for medium-sized and in-kind donations. As a second test, we consider the firm's ownership structure. Agency-motivated donations are less likely for family firms, in which ownership and control are largely unified, and for firms with effective governance, such as those with higher levels of institutional ownership. In these settings, agency incentives are minimal, and the main motivation for donating is strategic. We find that the strategic benefits of donating are indeed significantly stronger in family firms, where CEOs have few incentives to extract personal (monetary or reputational) benefits and in firms with more monitoring by domestic institutional owners.

Measuring market reactions to disaster-relief giving allows us to quantify the costs and benefits of corporate giving, which sheds light on the motivations of corporate philanthropy. Nevertheless, we also directly investigate firms' incentives to donate using a logit model. We find evidence consistent with both strategic philanthropy and agency-motivated giving. Disaster relief is more likely following larger disasters and for marketing-oriented firms, firms in more competitive and positively affected industries, and firms in more religious countries. Firms with worse governance, low institutional ownership, and CEOs who have a higher pay slice (Bebchuk, Cremers, Peyer, 2011) are also more likely to donate.

To ensure we are capturing market reactions to firms' disaster-relief giving, rather than other confounding effects, we consider donating firms located in areas that are directly hit by disasters ("affected firms") and split our event window into short-term and longer-term windows. We find that affected firms earn 0.4% lower returns in the three days following the disaster, relative to unaffected firms, decreasing to 1.3% lower returns in the three weeks following the disaster. Donating firms in affected areas earn 3% to 17% higher returns, relative to donating firms in unaffected areas. This suggests that donating serves a

signaling role for firms in directly affected communities: they can use their giving to signal their operational and financial strength while also benefiting from rebuilding their local community and boosting their image. Importantly, we find that disaster-relief giving affects returns both in the three-day and the three-week windows, whereas the direct operational effects of the disaster are only significant in the three-day window.

Finally, a key way strategic philanthropy affects firm value is by improving the firm's image, which helps attract new clients. Although disaster-relief giving is on average associated with declining sales growth, we find that sales growth is reduced less for more domestically oriented and marketing-oriented firms as well as for firms in more competitive industries or in construction, health, and legal services. We further confirm that our results cannot be fully explained by taxation or by dividing our sample into US or non-US firms. The results are also robust to controlling for the firm's annual nondisaster donations and firm fixed effects, and they are mainly driven by first-time donors.

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, corporate philanthropy can add value for shareholders when firms use their giving to build social capital and stakeholder support in the context of salient, attention-grabbing events.

Two guideposts can be used to place our findings in the context of the literature. First, exploiting natural disasters as a shock to corporate philanthropy allows us to distinguish the agency view from the strategic philanthropy view and enables a more precise and comprehensive analysis of the motivations, value implications, and social consequences of corporate philanthropy. Most other studies mostly focus on the agency aspect of corporate philanthropy during normal times (Fich, Garcia, Robinson, and Yore, 2009; Masulis and Reza, 2015; Cai, Xu, and Yang, 2020), but our setting allows us to identify the strategic dimension of corporate giving. Madsen and Rodgers (2014) similarly focus on the relation between corporate disaster-relief giving and firm performance. They find that stakeholder attention, driven by the legitimacy, urgency, and enactment of disaster relief, is a key determinant of performance. Our findings that CARs are higher for donations to more salient, attention-grabbing disasters support this hypothesis. Madsen and Rodgers (2014), however, exclude nondonating firms from the sample and do not account for

the role of agency-motivated donations. Other studies use different empirical methodologies to reduce endogeneity concerns, such as a Heckman selection model (e.g. Fich et al., 2009), a difference-in-differences setting using the 2003 US Dividend Tax Reform Act (Masulis and Reza, 2015), or an instrumental variable approach (Cai et al., 2020), but these are typically limited to country-specific examinations. Our setting can be extrapolated to a more general sample, as exogenous shocks in the form of large, salient events occur frequently across the world. Therefore, although our analysis is limited to natural disasters, its implications are likely to hold for other salient events, such as pandemics (e.g. the COVID-19 crisis) or attention-grabbing social movements.

The event study approach also allows us to more precisely quantify the shareholder wealth implications of corporate philanthropy. Studies have been unable to directly estimate these value implications, as many donations are disclosed in only firms' annual reports. Disaster-relief donations, in contrast, are typically announced in the days and weeks following the disaster, allowing for a more precise evaluation of shareholder wealth effects. Although the setting still does not directly speak to the decision to donate, which is likely endogenous, we can rule out many latent factors and alternative explanations by using an event-study approach around firms' disaster-relief announcements.

Second, our work contributes to the broader and emerging literature on corporate social responsibility (CSR). Corporate philanthropy is an important form of CSR (Benabou and Tirole, 2010) and has yet to receive sufficient attention, likely because of limited donation data and significant challenges in addressing endogeneity issues. In addition, CSR and philanthropy can be hard to distinguish, as the terms are often used interchangeably. Philanthropy is typically seen in the form of financial contributions, although it can also include gifts of employee time, equipment or infrastructure, and other firm resources (Seifert, Morris, and Bartkus, 2004; Godfrey, 2005). In comparison, CSR is often embedded in the corporation's business model and its business practices. By exploiting the differential reactions to corporate disaster relief, we can separate the strategic, opportunistic, and altruistic motivations for corporate philanthropy, which is notoriously difficult to do when studying CSR in general. This also allows us to distinguish corporate philanthropy from other types of CSR. In this regard, we join the debate that examines whether corporations

should be shareholder- or stakeholder-centric and the trade-off between shareholder value and societal welfare (Kitzmueller and Shimshack, 2012; Allen, Carletti, and Marquez, 2015; Ferrell, Liang, and Renneboog, 2016).

1. Theories on Corporate Philanthropy

Corporate philanthropy, especially in the form of disaster relief, can be substantial. For example, on December 26, 2004, an undersea megathrust earthquake and resulting tsunami in South Asia claimed 227,000 lives, displaced 1.7 million people in 14 countries, and inundated many coastal communities. It was one of the deadliest natural disasters in recorded history. The world responded by donating more than $13 billion and initiating the largest relief effort in history. While some funds came from national governments, the private sector response was unprecedented. According to the UN's Office for the Coordination of Humanitarian Affairs, approximately $2.5 billion was raised by the United Nations from institutional and individual donors worldwide. The U.S. Chamber of Commerce reported that US companies mobilized more than $565 million: about $273 million in cash contributions, $79 million in employee matching contributions, $140 million in in-kind donations, and $73 million in customer donations (Thomas and Fritz, 2006).

Understanding the motivations and consequences of corporate disaster-relief giving has important implications for societal welfare. Ballesteros, Useem, and Wry (2017) find that firms are better able than other organizations to sense areas of need, seize response opportunities, and reconfigure resources for fast, effective relief efforts. While traditional aid providers remain important for disaster recovery, relief arrives faster and nations recover more fully when local firms account for a larger share of disaster aid, as companies seek to respond in the most straightforward and immediate way by giving money or goods directly to the agencies on the ground.

The literature offers different views on corporate philanthropy, each having different implications for firm value, shareholder wealth, and societal welfare. The first view considers corporate philanthropy as a manifestation of managerial *agency problems* and as detrimental to shareholder wealth maximization. Masulis and Reza (2015) argue that CEOs often engage in corporate giving to secure private benefits by

giving to charities in which CEOs or other executives serve as trustees, directors, or advisers. These CEO-affiliated donations represent a misuse of corporate funds and may distort investment and financing decisions (Masulis and Reza, 2020). Similarly, Cai, Xu, Yang (2020) find that director-affiliated donations are considerably larger than the average director's annual compensation and that they remain mostly undetected, due to lack of formal disclosure. As such, affiliated donations may impair independent directors' monitoring incentives.

A second strand of the literature considers corporate philanthropy as strategic behavior that advances shareholder wealth maximization (Navarro, 1988). *Strategic philanthropy* links corporate giving with the firm's business interests and is based on the idea that corporate giving can increase a firm's financial performance and valuation. In this regard, corporate philanthropy serves as a marketing tool that can increase sales and attract clients by enhancing the firm's reputation. Others argue that corporate philanthropy indirectly reduces costs by reducing litigation and regulatory enforcement costs (Godfrey, Merrill, and Hansen, 2009) and serves as a community-oriented investment that increases support from local communities and binds employees to the firm (Montgomery and Ramus, 2007). In other words, this is "gaining by giving." The first president of the AT&T Foundation, Reynold Levy, once said the following.

> The best way to keep philanthropy vibrant, well regarded, and well funded in a corporation is to demonstrate its regular contributions to business success. That means that good corporate philanthropy incorporates both business interest and societal need. To find those areas of confluence requires knowing a company's businesses, as well as its customers, competitors, markets, and driving forces. And one must understand the charitable institutions and causes seeking a share of corporate wherewithal.[4]

The third view considers corporate philanthropy as *delegated philanthropy*, which arises as a result of societal demand. That is, corporate giving reflects the preferences of consumers and other citizens for corporations to assume social responsibility (Benabou and Tirole 2006; 2010). The delegated philanthropy view suggests that corporate donations can solve a collective action problem by aggregating individual investors' donations so as to make a larger impact (Benabou and Tirole, 2010). Different from the agency and strategic philanthropy views, which are based on theories of rational economic actors and standard

[4] Excerpt from *Give & Take: A Candid Account of Corporate Philanthropy*, R. Levy, 1999, Harvard Business Review Press.

preferences, the delegated philanthropy view is mostly based on behavioral explanations. Given this debate in the literature, our empirical tests mostly focus on the value implications of the agency versus strategic philanthropy views. Nevertheless, we try to provide some evidence on delegated philanthropy as well.

In our conceptual framework, a firm faces a cost-benefit trade-off when deciding on whether and how much to donate. Corporate donations for which the agency costs (costs from managers pursuing private benefits and from signaling other governance inefficiencies) outweigh the strategic benefits (from boosting the firm's reputation and social capital) will result in lower firm value. In contrast, donations for which the strategic benefits outweigh agency costs will translate into greater firm value.

In the context of disaster-relief giving, we expect the strategic benefits of corporate giving to become relatively more important. A salient event, such as a disaster, draws investors' attention to donating firms, increases the legitimacy of using corporate funds for social purposes, and helps firms build their reputation, social capital, and stakeholder support (Madsen and Rodgers, 2014). At the same time, increased attention by investors and the public on the affected and proximate firms reduces opportunities to make donations that provide private benefits for insiders.

We argue that the extent to which the strategic benefits outweigh the agency costs depends on (i) the saliency of the disaster to the firm and (ii) the importance of social capital to the firm. The strategic benefits of philanthropy are amplified as disaster saliency increases, because more salient disasters attract more attention from the media and the public, which increases the legitimacy of corporate giving. Similarly, the more the firm relies on reputation and social capital in its day-to-day operations, the more strategic benefits from stakeholder support it can obtain by providing donations to the community. In contrast, donations are more likely to be value-destroying when the disaster is less salient and when the firm relies less on its social image (as argued, for example, by Masulis and Reza (2015) who focus on nondisaster-relief donations). Ultimately, the cost-benefit trade-off is reflected in the firm's abnormal returns following disaster-relief announcements.

2. Data and Empirical Strategy

2.1 Data

Our sample consists of 28,332 international, publicly listed firms for which accounting and financial data are available from Datastream, Compustat, or CRSP. As we are interested in the value implications of donating around natural disasters, we measure shareholders' market reactions in the 23 days around the disaster using an event study approach. The firm's cumulative abnormal returns (CARs) are calculated relative to expected CAPM returns based on the local market index of the firm's home country.[5] 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. For example, Apple started donating various amounts in the days after Hurricane Harvey hit Texas on August 24, but the bulk of the donated amount ($5 billion USD) was granted 15 days after the disaster on September 8. Other firms required some time to gather funds to donate; for example, AkzoNobel donated $250,000 USD to Hurricane Harvey victims on September 7.[6] Based on a sample of disaster relief newspaper announcements, Figure 1 confirms that less than 5% of donations are made outside of the [-1,+21]-day window around the disaster, further reducing reverse causality concerns. In a robustness test in Table 10, we split the event window in a short-term [0, +3] window and a long-term [+2,+21] window.

[Insert Figure 1 about here]

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

[5] We consider the country where the firm is headquartered as the home country, rather than the country of incorporation, as the headquarters location is typically where most business is conducted, where the firm is listed, and where most employees, customers, and suppliers are located.

[6] Although the actual transfer of the donation may occur months after the disaster, the announcement of the donation is likely to be made in the three weeks following the event. Similarly, although firms' disaster-relief programs may be long-term projects covering months or years, their announcement is likely to shortly follow the event.

lists the cities, counties, and regions affected by the disaster, allowing us to distinguish firms headquartered in affected regions from those elsewhere. As we are interested in firms' market reactions following a natural disaster, our unit of observation is at the firm-disaster level, where we consider all firm-disaster pairs where the disaster occurred in the same country as the firm's headquarters.[7] This results in a total sample of 222,232 observations covering 1,021 natural disasters in 45 countries, of which 218,533 observations are firms located in zip or postal codes not directly affected by the disaster (and the remaining 3,048 observations are firms in affected areas). Our main analysis focuses on firms in unaffected areas to avoid capturing market reactions to disaster-induced operational or financial changes in the firm. Appendix B shows that the most disasters occurred in China (258), the United States (237), and India (58).

We obtain data on corporate donations from Foundation Maps, which collects worldwide data on foundations and grants since 2006. It provides highly detailed information on funders, grant descriptions, and recipients. Foundation Maps collects data from various sources, including government filings, websites, news items, and other funder networks. Funders and recipients can also choose to voluntarily submit their information. Foundation Maps covers grants by individuals, corporations, governments, public charities, and nongovernmental organizations. To our knowledge, it is the most comprehensive data source for donations information—especially for corporate philanthropy—with global coverage. For the purpose of our analysis, we collect data on grants by publicly listed corporations (either directly through a corporate giving program or indirectly via a company-sponsored foundation) that we can directly link to disaster and emergency management or that have disaster victims as the targeted population.

We manually match corporate foundations and corporate giving programs to our global sample of publicly listed firms based on foundation and program names, descriptions, and locations, and match each individual grant to a firm-disaster pair based on the recipient's location and grant description. This allows us to identify market reactions to whether a firm made a disaster-specific donation and the amount donated

[7] For sudden disasters, EM-DAT identifies the event date as the first date the event caused substantial damage. For example, although Hurricane Harvey reached tropical storm status on August 17, it only made landfall on August 25 at San Jose Island in Texas. Therefore August 25 is considered as the start date. Subsequent landfalls in other areas are not listed as separate events.

while accounting for the severity of the disaster. For example, our matching identifies Mitsubishi's $1.7 million USD donation to victims of the 2011 Great East Japan earthquake that resulted in the deaths of over 15,000 people and over $210 billion USD in damage. A similar case features Apple's $2.5 million USD grant to victims of the 2012 Hurricane Sandy, which resulted in over 50 deaths and over $50 billion USD in damages.

Although the percentage of publicly listed firms making disaster-specific donations is relatively small, at just below 2% of the total sample of 222,232 observations, the large coverage of our analysis means the donation-level sample still consists of 2,748 disaster-specific grants by 433 firms between 2006 and 2018. The large share of nondonating observations arises from the fact that 99% of publicly listed firms do not donate to small- or medium-sized disasters in a given country. 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 United States and China) or with more publicly listed firms (e.g. Japan, Australia, and India) will be featured relatively more often in our sample. Countries that have no recorded disasters in the EM-DAT database between 2006 and 2018 or that have no publicly listed companies in the CRSP and Compustat databases are not included in our sample and are indicated in gray.

[Insert Figure 2 about here]

2.1 Summary Statistics

Table 1, Panel A, provides summary statistics for the complete sample of 218,533 firm-disaster observations, covering 1,021 natural disasters and 28,730 unique firms headquartered in *unaffected* areas. Panel B only includes sudden disasters, as these will be the main focus in our multivariate tests. We consider a range of variables that may affect firm's philanthropy and market reactions around disasters, which we discuss in more detail in Section 2.2 below. Shareholders' market reactions in the 23-day window around a natural disaster are close to zero at –0.1% (10 basis points) for the full sample and 0.1% for the sudden disasters sample. Given that these are firms located in unaffected areas, the small economic effect is not

surprising. We can identify disaster-specific donations for 1.2% of the sample or 2,714 firm-disaster observations. These firms donate on average $419,498 USD to disaster relief. The average (sudden) disaster results in $2 billion ($4 billion) USD in damage to the local community.

[Insert Table 1 about here]

Table 2 shows summary statistics for donating and nondonating firms. CARs are 1% lower for donating firms, but the difference is statistically insignificant. Donors 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 (e.g., Masulis and Reza, 2015, 2020; Cao, Xu and Yang, 2020), donors 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, based on governance data in ASSET4 and the U.S. E-Index by Bebchuk, Cohen, Ferrell (2009). In contrast to the literature, which largely focuses on U.S. public firms, we find that firms that make disaster-specific donations tend to be more profitable, have higher sales-to-assets ratios and more fixed assets, and lower R&D expenses. However, they have more SG&A expenses, indicating a higher reliance on organizational capital and marketing. In line with the taxation channel, donating firms are less likely to have negative tax rates (i.e., zero tax rate or tax rebates), and their average effective tax rate is slightly higher. Table C1 of the appendix compares affected firms to unaffected ones, based on their postal codes. We find that donating firms are not more likely to be located in affected areas, which further validates our setup in that natural disasters do not disproportionally affect donors. Firms in affected areas have lower sales-to-assets ratios in the year of the disaster, more intangible assets, are less profitable, and have higher SG&A expenses.[8]

[Insert Table 2 about here]

[8] Appendix Table C2 compares firms in affected administrative areas (but unaffected postal codes) to those in unaffected administrative areas. The differences are similar, but less pronounced, and firms in unaffected postal codes but affected administrative areas are 0.6% more likely to donate than those in unaffected administrative areas.

2.2 Methodology and Identification

To evaluate the value effects of corporate donations around natural disasters, we estimate the following regression.

$$CAR[-1,+21]_{i,d} = \alpha + \beta \cdot (Disaster\text{-}Level\ Donation)_{i,d} + \gamma \cdot (Controls)_{i,t-1} + d_{c,t} + e_{j,t} + f_d + \varepsilon_{i,d},$$

where *Disaster-Level Donation* is an indicator variable for whether firm *i* donated following disaster *d*, *Controls* is a vector of firm-level control variables, including an indicator for foreign activities, ROA, PPE-to-assets, firm size, and the firm's effective tax rate, measured in the year before the disaster happened. *d* denotes country × year fixed effects, *e* is a vector of industry × year fixed effects, and *f* denotes district (county, state, province, or administrative area) fixed effects. To investigate the trade-off between agency costs and strategic philanthropy, we interact *Disaster-Level Donation* with a range of variables that relate to the saliency of the disaster and the importance of social image to the firm. Variable definitions are provided in Appendix Table A.

Our identification strategy is based on the natural disasters' unanticipated and attention-grabbing nature. Firms' philanthropy may be driven by characteristics that are hard to control for in a regression estimation. Our setting addresses this issue by focusing on exogenous events that affect the cost-benefit trade-off of donating. Specifically, natural disasters increase the strategic benefits of donating, allowing us to zoom in on strategic philanthropy as a key driver of firms' incentives to donate. In addition, the use of cumulative abnormal returns (CARs) implies that we can capture market reactions to disaster-related corporate giving, rather than to other firm characteristics, as we can account for firms' normal returns absent a disaster. These features are specific to the disaster setting and help us alleviate reverse-causality and other endogeneity concerns. To distinguish self-serving donations from strategic ones, we focus on disaster-, industry-, and country-level characteristics that cannot easily be influenced by firms themselves. In the majority of our tests, we zoom in on firms located in the same country but in zip or postal codes not directly affected by the disaster. This reduces concerns that the disaster may directly affect the firm's operations, customers, suppliers, or employees. Although this setting does not perfectly eliminate the endogeneity concern—firms

may still be differentially motivated to donate around natural disasters—it allows us to capture more precisely the value implications of corporate philanthropy.

We further control for a host of fixed effects (including firm fixed effects in the robustness tests), which allows us to rule out a wide range of underlying drivers. A caveat is that our data does not capture the exact timing of firms' donations, so one could argue that the 23-day window following a natural disaster captures shareholder reactions to the disaster rather than to firms' corporate giving. We therefore also estimate the market's reaction around the announcement dates of firms' disaster-relief giving for a smaller sample for which we manually collect data on press releases and newspaper articles in Section 3.2. These findings confirm the results from our main analysis, reducing concerns that we are picking up other firm or disaster characteristics in our main tests.

Our measures of disaster saliency include disaster size, type, and relevance (in terms of public internet searches), and we consider a range of firm-, industry-, and country-level proxies for the importance of reputation. We consider the firm's geographic coverage (in terms of degree of internationalization), marketing expenditure, R&D spending, product market competition as well as the religiosity and government funding in the firm's country as characteristics that affect the strategic value of donating. We also investigate the role of donation type (cash versus in-kind) and size and the role of ownership structure. Details of these variables and tests are explained in the next section and in Appendix A.

3. Results

3.1 Main Results: Disaster Type and Size

Our baseline tests investigate the relation between corporate philanthropy and firm value by considering shareholder CARs for donating and nondonating firms in unaffected areas following a natural disaster.[9] Panel A in Table 3 reports the results from OLS estimations for our main specification as set out in Section 2.3. All tests control for a firm's international focus, profitability, fixed assets, size, and tax rate and include

[9] Our results do not materially change if we exclude firms with customers or suppliers in affected areas or if we control for firms having affected customers or suppliers. These additional results are available upon request.

country-by-year fixed effects, industry-by-year fixed effects, and district fixed effects. Column (1) shows that donating firms located in unaffected areas earn 0.50% lower returns in the [-1,+21]-day window around the disaster, relative to nondonating firms in unaffected areas. The negative stock market reaction is in line the findings of the existing literature, as agency-related costs on average outweigh the strategic benefits associated with disaster-relief giving. The consistency with the literature reduces the concern that our findings are driven by sample choice or that they are specific to disasters. Panel B in Appendix Table E further shows that our main results also hold for a subsample of US firms, which is used in most of the literature.

The coefficients for the control variables also comport with expectations: large multinationals earn higher returns. Firms with more fixed assets (PPE) and higher ROA ratios earn lower returns. To further reduce concerns that our results may reflect firm behavior in response to customers, suppliers, or employees being affected by the disaster, we also control for whether the firm has suppliers or customers in affected areas. This does not materially affect our results (results not reported).

Although disaster-relief giving is on average associated with lower returns, we expect the strategic benefits of donating to increase with disaster saliency. In Column (2), we consider a sample of disasters in the top quartile of the severity distribution (in terms of economic damage and human casualties). Donors on average earn 0.2% lower return than nondonors, which is significantly less negative compared to the full sample results in Column (1). This suggests that the negative stock market reaction to disaster-relief giving is weaker for larger disasters.

Not all natural disasters are equal: whereas some are sudden and unanticipated, others are longer term and affect communities over an extended period. Given our use of an event study approach over a relatively short window, our findings should primarily reflect market reactions to sudden and unanticipated disasters, such as earthquakes, flash floods, tropical cyclones, landslides, tsunamis, and volcanic eruptions. These disasters are also more salient to investors and to the firm, given their unanticipated nature. In contrast, non-immediate, longer-term disasters, such as droughts or extreme heat and cold waves, can to a certain extent be anticipated and viewed as less salient by investors and the public. In addition, there is often no clear-cut

event date for a long-term disaster, with the scale typically only becoming clear weeks or months after the start of the disaster, and so firms are unlikely to donate at the beginning of a long-term disaster. Overall, we expect that market reactions to disaster-relief giving are driven by sudden, unanticipated disasters rather than longer-term ones.

Column 3 shows no significant market reactions to corporate donations for long-term disasters, but, in Column (4), we find that donating firms in unaffected areas earn 1.3% lower CARs, relative to nondonors following sudden disasters. These results reduce the concern that market reactions reflect other underlying characteristics of donors. Although the firms in Column (3) may provide disaster-relief giving later in the disaster period, market reactions do not differ significantly at the onset of the disaster when donations have not materialized yet. To ensure we are capturing disaster-specific giving, our analysis focuses on market reactions to sudden, unanticipated disasters in the remainder of the paper.

Not only the type of disaster but also its scale affects its saliency to firms and the strategic benefits of giving. Tilcsik and Marquis (2013) find that corporate giving by firms in affected areas depends significantly on the severity of damage caused by the disaster. They show that, while major disasters damp the propensity of affected firms to donate, smaller-scale disasters boost corporate giving. However, major disasters are generally subject to more extensive media coverage and publicity. This additional exposure draws more attention from investors, such that firms can benefit more from increased visibility of their charity campaigns and can provide stronger stakeholder commitment signals. Moreover, disaster-relief following large disasters may be perceived by shareholders as a more legitimate use of corporate funds. We therefore expect that the strategic benefits of donating increase with the scale of the disaster, particularly for firms located in unaffected areas.

In Panel B of Table 3, we consider how disaster size (in terms of damage caused) and relevance (in terms of web search intensity) affects the cost-benefit trade-off of corporate giving. In Column (1), we interact the donations indicator with disaster size, using the logarithm of the dollar value of damages caused

as a proxy.[10] Consonant with the notion that larger disasters attract more media and investor attention and increase the legitimacy of donating, we find that corporate giving increases CARs by 0.06% for every percent increase in disaster size. Expressed in terms of disaster size deciles, donations to disaster relief in the lowest decile decrease 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.

A second proxy for the attention-grabbing nature of a disaster is the intensity of public web searches. Salient disasters are more attention-grabbing, and people seek more information about them. Search intensity is measured as the logarithm of the number of Google web searches for a specific disaster in the month that it occurred (e.g., how often people searched for information using the keywords "hurricane," "tsunami," "earthquake," etc.). 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 the public and shareholders are paying more attention.

In Columns (3) and (4), we further construct indicators for small disasters (damage in the bottom quartile, i.e., less than $2 million USD) and for large disasters (damage in the top quartile, i.e., greater than $1.8 billion USD). Column (3) shows that the negative effect of donating for unaffected firms is driven particularly by small-scale disasters, as only the interaction coefficient appears statistically significant. This comports with our expectations that there are fewer strategic benefits following small disasters, which attract less media attention and offer fewer opportunities for firms to engage in marketing, reputation-building, and community-building. This situation also facilitates CEOs and executives quietly donating to their affiliated charities, amplifying agency costs. In unreported tests, we find that the large negative coefficient of -6.9% is driven by "vague" donations for which little information is provided on how and where the funds will be used, suggesting that these may be agency-motivated donations, and by excessively large donations to small disasters: above-median donations (on average $509,533) to small disasters trigger

[10] Total damage only captures physical damage to infrastructure, pastures, etc., and does not account for human damage or deaths. In Appendix Table D, we define disaster size based on total deaths caused by the disaster. The results are similar in terms of significance and magnitude of the coefficients.

up to -12.2% lower returns, whereas below-median donations (on average $48,170) earn -1.0% lower returns.[11]

Column (4) shows that an average donating firm earns 1.8% lower CARs if the disaster is small or medium, but this effect is offset for large-scale, attention-grabbing disasters. For firms in unaffected areas making donations following small-scale disasters, the lack of strategic benefits, reduced legitimacy, and potentially higher agency concerns result in negative shareholder wealth effects. For larger, more salient disasters, however, the strategic value of disaster-relief giving is higher, offsetting completely the agency-related costs.

[Insert Table 3 about here]

3.2 Donation Announcement Dates

A potential concern is that our [-1,+21]-day event window captures market reactions to indirect effects of the disaster on the firm's operations, customers, suppliers, or competitive environment. To address this concern, we manually collect announcement dates of firms' disaster-relief donations from press releases and newspaper articles following the disaster. Where firms make multiple announcements regarding follow-up grants, we measure market reactions to the first announcement following the disaster event. Although this approach considerably reduces our sample size, it provides a more precise way to investigate market reactions to firms' disaster-relief giving. Given the short [-1,+1] window around the donation announcement, it is unlikely we are capturing market reactions to events besides disaster-relief announcements.

Panel A in Table 4 shows univariate statistics for the mean announcement returns to firms' disaster-relief giving. Column (1) shows that market reactions are on average weakly positive at 0.6%. The approach of manually collecting data on press releases skews the distribution to the larger disasters, as it is harder to pick up on disaster-relief announcements following small, local disasters. These often appear in local

[11] An example of an excessively large donation is Hyundai's $1.5 million donation to victims of tornadoes in Georgia and Alabama in the United States in 2011, triggering CARs of -7.0%.

newspapers or other sources, and records of them are harder to retrieve manually. Nevertheless, in Column (2), we distinguish large-scale disasters from small- and medium-sized disasters. The positive market reaction slightly increases to 0.7% for the sample of large-scale disasters. In Columns (3) and (4), we distinguish long-term and sudden disasters and find, as before, that the firm's abnormal returns are entirely driven by the sudden disasters.

In Panel B, we consider a similar analysis as in Panel B of Table 3, although our sample here is limited to donating firms only (as we do not have a suitable benchmark event date for nondonors). The results confirm the findings from Table 3. Every percentage increase in disaster severity (in terms of damage caused) or relevance (in terms of search intensity) increases returns by 0.7% and 0.6%, respectively. Similarly, Columns (3) and (4) show that returns are 2.6% higher for large-scale disasters, relative to small- and medium-scale disasters. Despite the different samples and the change in event window, the results in Table 4 confirm the findings from our large-sample analysis in Table 3: firm CARs increase with greater disaster saliency, investor attention, and donation legitimacy.

Panel C addresses the concern that natural disasters could increase not only the strategic benefits but also the agency motives for donating: a disaster can legitimize managers' donations to affiliated charities, and it can enable managers to boost their personal reputation at the expense of the company and its shareholders. We investigate this channel by creating an indicator capturing whether the CEO's name is mentioned in a disaster-relief press release. CEOs who donate to boost their reputations are more likely to draw attention to themselves in a disaster-relief announcement, proxied by name references in the article or press release. Although we find no evidence for an agency-motivated giving in Column 1, as returns are 0.8% higher for press releases mentioning the CEO, Column 2 shows that CEO references for large donation amounts are associated with significantly negative returns. Similarly, Columns 3 shows that returns are significantly negative for CEO references in donation announcements by powerful CEOs (proxied by a high wage ratio). These results indicate that the CEO personal reputation channel can increase agency costs for disaster-relief donations but only when combined with other proxies for poor governance.

Column 4 considers the legitimacy channel by investigating whether a donation was made to a large reputable NGO, such as the Red Cross. Donations to large NGOs are unlikely to be affiliated donations, reducing the concern that they may be agency-motivated. The results show that donations to NGOs are associated with 2.2% higher returns, consistent with these being less likely to reflect agency concerns. Moreover, donations with a reference to the CEO that are not made to large NGOs are associated with 2.5% lower returns, consistent with these being more likely to be agency-motivated. Overall, these results show that it is unlikely that a disaster increases the agency costs of donating to the same extent it increases the strategic benefits. Although there is some evidence for a personal reputation channel, this is limited to donations that are more likely to be agency-motivated to start with (e.g., large donations, non-NGO donations, and donations by powerful CEOs). We can therefore assume that, on average, a disaster increases the strategic benefits of donating more than the agency costs.

[Insert Table 4 about here]

3.4 Testing the Strategic Philanthropy View

Under the strategic philanthropy view, firms give to attract new customers, boost sales, broaden their access to capital, and build stakeholder support. The strength of these strategic benefits increases with the attention drawn to the disaster associated with firm's corporate giving but also with its reliance on reputation and social image in general. Therefore we consider a set of firm-, industry-, and country-level proxies for the importance of social capital in Tables 5 and 6. Although these proxies are less exogenous than disaster-related characteristics, they can measure more precisely the extent to which firms can benefit from strategic philanthropy. Firms can then "gain by giving" and use corporate philanthropy to enhance firm value, reflected in higher and positive CARs.

We first focus on firm characteristics that measure the extent to which firms rely on marketing in their day-to-day operations (i.e., for whom the strategic value of corporate giving is greater). In Column (1), we interact the donations indicator with an indicator measuring a firm's geographic focus (*Domestic Focus*).

Internationally active firms source inputs or sell products abroad, have foreign subsidiaries, and overall rely less on customers or suppliers in their home country. A domestic natural disaster is then less relevant to their overall operations. In contrast, firms with a domestic focus have more to gain from using donations to build their social capital with the local community and stakeholders. We find that, whereas donations by international firms are associated with 2.1% lower returns, donations by domestic ones are associated with 0.9% (= 2.1% - 1.2%) lower returns, indicating that the strategic benefits for domestic firms are greater and corporate giving is less likely to destroy value for them (although the net effect is still negative).

In Column (2), we focus on firms that spend relatively more on marketing, as these firms may benefit more from increased legitimacy and visibility of charity programs (Servaes and Tamayo, 2014). 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, that is, those that rely less on marketing, are associated with 2.2% lower returns but donations by firms with high SG&A expenses earn 2.1% higher returns than those by less marketing-oriented firms. These results are consistent with the use of corporate philanthropy as a strategic marketing tool: shareholder value increases when firms that rely relatively more on marketing make disaster-related donations. We perform a similar test in Column (3), 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 most from making donations, given that they are often subject to public scrutiny and rely more on intangibles. Consistent with this conjecture, we find that low-R&D firms' donations decrease shareholder value by 1.5%, whereas donations by high-R&D firms increase shareholder returns by 3% (= 4.5% - 1.5%).

We next investigate industry-level factors. The literature has shown that firms in industries such as banking, health and legal services, and construction can be helped by natural disasters (Koetter, Noth, and Rehbein, 2019). Banks, both in affected and unaffected areas, can lend more (Cortes, 2014) at higher interest rates (Bos, Li, and Sanders, 2018), and firms in construction, healthcare, and legal services are likely to see an increase in demand from households and businesses looking to heal, rebuild, and deal with

insurance claims.[12] Column (4) therefore distinguishes firms in positively affected industries which, following Koetter et al. (2019), are defined as those in the construction, banking, durable wholesale trade, public administration, and healthcare and legal services. Corroborating the idea that the strategic value of donating (reputational gain and increased future sales and resources) is greater in firms that can strategically use their products and industry expertise, we find that returns are 3.9% higher (increasing shareholder value by 2.1%) for donors in positively affected industries, relative to other firms.

In Column (5), we consider the role of product market competition. Firms in more competitive markets are more likely to distinguish themselves from competitors by using donations to build their brand. These firms therefore have more to gain from using corporate philanthropy as a marketing tool to stand out from competitors. We measure product market competitiveness by constructing an industry-level Herfindahl-Hirschman Index (HHI). We find that shareholder value increases by 2.3% for donating firms in highly competitive industries, relative to donors in less competitive industries, and 0.6% relative to nondonors in less competitive industries.

[Insert Table 5 about here]

Although corporations provide a considerable amount of relief following a natural disaster, governments typically provide the most. The amount of relief (expected to be) provided by the government is likely to affect the perceived legitimacy of the use of corporate funds for relief purposes. Markets are likely to react more negatively to corporate donations if governments provide a lot of funding, as the perceived need for corporate funds for relief is lower. In this sense, we can again test the strategic philanthropy view of corporate giving: the strategic benefits for corporate disaster relief are higher if government relief funding is low. We therefore investigate the role of funding by other institutions and governmental agencies in affecting returns to corporate disaster-relief giving in Table 6. Column (1) shows the result using the amount of grants provided by noncorporate and nongovernmental charities as a fraction

[12] See, e.g., "Emergency Preparedness and Disaster Planning for the Legal Profession in Australia," June 2011, National Pro Bono Resource Centre.

of GDP, interacted with the corporate disaster-relief giving indicator. Returns for donating firms are 3.3% lower if other charities provide an above-average amount of disaster relief. Similarly, Column (2) shows the result using scores for the country's social and environmental regulations, which captures the number of rules and regulations with regard to environmental issues and other social causes: these governments are more likely to provide funding following or even before (in a preventative sense) a disaster. Again, abnormal returns are 2.2% lower if firms provide disaster relief in a country with a socially conscious government, relative to those in a less socially conscious country. These effects are also reflected in Column (3), where we capture the amount of disaster-relief funding provided by the government as a fraction of GDP. As before, returns are significantly lower if firms provide disaster-relief grants in a country where the government already provides an above-average amount of funding. The results in Columns (1)–(3) indicate a substitution effect in terms of corporate versus government funding, in which the agency costs of donating outweigh the strategic benefits. Abnormal returns then reflect the lower perceived legitimacy of corporate giving and the higher likelihood of agency-motivated donations.

However, not only the amount of government influence in disaster relief affects the perceived legitimacy and cost-benefit trade-off of donating. Demand-driven social norms and values in a country also affect the perception of corporate giving and therefore its strategic benefits. For example, religiousness increases people's generosity and propensity to donate, and religious people's perceived salience of a disaster is higher—some even argue that religion exists *because* of natural disasters (Bentzen, 2019). The extent to which people are religious should then increase the strategic value of disaster-relief giving by corporations. Column (4) measures the percentage of people regularly attending a church or religious service and finds that being in a country with above-average religiousness (*High Religiousness*) offsets the negative effect of donating. Whereas donations by firms in less religious countries are considered value-destroying, with 1.2% lower CARs relative to nondonors, the CARs for donations by firms in more religious countries offset the negative returns, resulting in a zero net effect on shareholder wealth. These results indicate that societal norms that support philanthropy and altruism can increase the strategic value of corporate philanthropy.

Note that, although we interpret the above results as supporting the strategic philanthropy view, we acknowledge that they may also lend credence to the delegated philanthropy view. That is, corporate philanthropy may reflect societal demand for corporations to assume greater social responsibilities (Benabou and Tirole, 2010). In this sense, the societal demand for corporate disaster-relief would be higher when government relief funding is low and ESG regulations are weak and when social norms value altruism more (as represented by high religiousness). However, stronger altruistic norms may also lead to greater government relief funding and more stringent ESG regulations (Liang and Renneboog, 2017). Given the mixed theoretical arguments and empirical predictions, we only focus on distinguishing between agency and strategic philanthropy views and leave testing of delegated philanthropy view to future studies with a more sociological focus.

[Insert Table 6 about here]

3.4 Determinants of Disaster-Relief Giving

The evidence so far points to both agency costs and strategic benefits of corporate disaster-relief giving. Are these two factors equally important in motivating corporations to donate? We illuminate this question by investigating firms' incentives to donate in a logit model, where we regress the likelihood of providing disaster-relief donations following a natural disaster on a set of proxies for strategic and agency-motivated donations. In Table 7, we investigate the strategic motives in Columns (1) to (5), using disaster saliency and social image proxies, and we investigate agency motives in Columns (6) to (9).

Column (1) shows the result of disaster saliency measured by the log of damage caused. Firms are 0.2% more likely to donate for every percentage point increase in disaster severity, corroborating the notion that the increased attention to larger disasters increases the strategic benefits of donating. Columns (2) and (3) consider firm-level proxies for the relative importance of reputation and social image. Firms that rely more on marketing in their day-to-day operations are 0.6% more likely to donate (Column (2)), but high R&D firms appear 1.3% less likely to donate (Column (3)). This may be caused by the lack of industry-by-year

fixed effects in the logit model.[13] Column (4) considers industry competition and finds that firms in more competitive industries are 0.3% more likely to donate. This is again consistent with these firms having more to gain from using donating as a marketing tool to stand out from competitors. Column 5 considers all variables simultaneously and finds similar results on each strategic philanthropy proxy. The coefficients on the control variables comport with findings in the literature: like Masulis and Reza (2015), we find that larger and more profitable firms are more likely to donate. Internationally active firms are less likely to donate, again consistent with the strategic philanthropy view: internationally active firms rely less on local customers and therefore have less to gain from using philanthropy as a marketing tool.

In Columns (6) to (10), we consider other governance- and agency-related proxies that have been investigated in the literature. Following Masulis and Reza (2015), we consider the level of corporate governance at the firm level. We construct an entrenchment index (E-index) for our international sample, following Bebchuk et al. (2009) in Column (6). The E-index measures the extent to which managers are entrenched, based on the presence of, for example, staggered boards, poison pills, and supermajority requirements. We find that firms with more entrenched managers (worse governance) are more likely to donate. Column (7) considers a different firm governance index, this one from MSCI, which also captures measures such as accounting quality. Because higher values of the index reflect better governance, we construct a below-average governance index indicator (*Low Governance Index*) as a proxy for poor governance. The results show that worse governed firms are 0.9% more likely to donate, consistent with corporate philanthropy as a manifestation of agency problems in the firm.

Column (8) considers the firm's institutional ownership, as institutional owners improve firm-level governance (e.g., Aggarwal, Erel, Ferreira, Matos, 2011). We find firms with low institutional ownership ratios, that is, with potentially poorer governance, are 0.5% more likely to donate. Finally, Column (9) considers a proxy for managerial power by measuring the ratio of the CEO's wage, relative to the wage of

[13] We have not included industry-by-year or country-by-year fixed effects in the logit models, as it is computationally intensive to test nonlinear models using many fixed effects and many of the existing fixed effects logit models have been shown to be inconsistent (Baetschmann, Staub, and Winkelmann, 2015).

the second highest-paid executive in the firm. More powerful, rent-seeking managers aim to receive higher wages (Bebchuk, Cremers, Peyer, 2011) and are more likely to use corporate philanthropy to boost their own reputation, rather than that of the firm. We indeed find that CEOs with a greater pay slice are 0.8% more likely to donate. Column (10) considers all agency proxies simultaneously, finding similar results. Note that our choice of variables for agency costs differs from ones in the literature (which are mostly based on US samples), as the international sample limits the use of, for example, affiliated charities. Nevertheless, we believe our agency indicators comprehensively capture agency problems within donating firms.[14]

Overall, these results are consistent with prior findings suggesting 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 firm charitable giving and that donating can increase firm value if the strategic benefits are sufficiently large.

[Insert Table 7 about here]

3.5 Donation Characteristics and Firm Ownership

One may still argue that disaster saliency also increases the agency incentives of donating (particularly by increasing CEOs' personal reputational benefits) or that more marketing-oriented firms also have more agency concerns. Therefore we try to further distinguish agency-motivated philanthropy from strategic philanthropy by considering the amount donated and the type of donation and the ownership structure of the firm.

3.5.1 Donation Size and Type

On the one hand, donating large amounts to disaster relief can decrease shareholder value if the strategic value effects do not outweigh the costs of reduced cash reserves or if managers attempt to boost their

[14] Appendix Table E also confirms existing studies by showing that donating earns more negative returns for poorly governed firms with more agency concerns.

reputations by making excessive donations. On the other hand, large donations can have more strategic value for the firm if they attract more attention from the media and investors. They can even reflect societal demand (i.e., delegated philanthropy) in which firms aggregate individuals' donations to achieve a larger impact. In addition, if markets only care about the decision to donate, regardless of how much it donates, firms may be able to maximize the reputational value-increasing benefits while minimizing their cash outlay.

Column (1) in Table 8 estimates a linear OLS regression of abnormal post-disaster shareholder returns on the donation amount as a fraction of firm assets. Consistent with larger donations being more likely to be agency motivated, we find that every percentage point increase in the donated amount decreases CARs by 0.6%. However, the relation between donation amount and shareholder value is not necessarily linear: a donated amount deemed too small may trigger public outrage and a loss of stakeholder support, whereas one deemed too large may be disappoint shareholders. We investigate the latter in Column (2), where we include the squared value of the donated amount in our specification. We find that there is a quadratic, concave relation between the amount donated and shareholder value, with returns increasing for medium-sized donations but decreasing for small and large amounts. The strategic value of donations is thus optimized for medium-sized donations: intuitively, small donations are more likely to be motivated by agency concerns and offer fewer strategic benefits. (Firms may even be perceived as stingy by the public for providing very small donations.) Similarly, excessively large donations induce substantial costs and may even be used to build the manager's image, rather than improve the firm's reputation.

In Column (3), we investigate whether shareholder returns differ for various types of donations, notably cash donations versus in-kind donations (Seifert et al., 2003). Cash donations may induce more agency-related costs, as they reduce the firm's liquid resources and managers can use them to tunnel money to nonstrategic or affiliated charities. In-kind donations, in which firms donate products or equipment, on the other hand have more strategic value by enabling firms to reduce excess inventories or written-off equipment while still boosting the firm's reputation. They may even be perceived to involve more active firm participation by stakeholders (Madsen and Rodgers, 2014). Indeed, we find that, whereas cash

donations reduce shareholder returns by 1.4%, donations consisting of products or equipment result in 2.5% higher returns, relative to cash-donating firms.

[Insert Table 8 about here]

3.5.2 Ownership Structure

Next, we focus on the role of a firm's ownership structure to further disentangle the agency view and strategic philanthropy views. Specifically, we investigate the influence of family owners and institutional owners, which can both reduce the agency-related costs of donating. Firms in which CEOs are the ultimate owners have few incentives to tunnel corporate funds to affiliated charities. Even in family firms with an outside CEO, family board members may prohibit any agency-motivated donations. Similarly, the literature has shown that firms with higher shares of institutional ownership are better governed and better monitored, reducing agency problems. In Appendix Table F, we therefore investigate whether the strategic benefits of donating are more pronounced in firms with family or institutional ownership, as the agency motives are minimized in these settings. Column (1) interacts the donations indicator with an indicator for family firms. (The sample is limited to firms for which ownership information is available in FactSet.) The results are consistent with 0.4% higher returns to donating in family firms. Column (2) focuses on a subsample of family firms and finds that donating is associated with 4.8% higher returns, relative to not donating, and that returns increase further by 2.1% following large, more salient disasters. As agency motives are considerably weaker in family firms, these results further confirm that we are capturing an increase in strategic benefits, rather than a change in self-interested donations.

Columns (3) and (4) consider the influence of institutional ownership. Column (3) shows that, in firms with high levels of institutional ownership (i.e., above the sample median), the negative effects of donating are completely offset. In Column (4), we distinguish domestic and foreign institutional owners. We expect that domestic institutional owners are more likely to view corporate disaster-relief giving favorably, as they are more invested in the local community, relative to foreign owners. We find that, in firms with higher

percentages of domestic versus foreign institutional ownership, donating is associated with 0.5% higher returns, relative to nondonors. These results indicate that, in firms where agency problems are likely to be weaker, donating earns significantly positive returns in a disaster setting, consistent with strategic philanthropy effects becoming more dominant.

4. Robustness Tests

In this section, we conduct several robustness tests, including investigating sales growth as a channel through which corporate giving affects returns, considering a sample of firms in directly affected areas, testing the relation between climate-induced disasters and firm-level environmental performance, and using various other specifications and subsamples.

4.1 Operating Performance: Sales Growth

If markets are rational and efficient, stock price movements reflect changes in firms' future cash flows. Firms with better reputations tend to outperform those with worse reputations by attracting new socially conscious customers, suppliers, and employees, which leads to greater revenue and turnover. Therefore we investigate whether donating firms experience higher sales growth, relative to nondonors, in the year of the disaster. To this end, we run a similar set of tests as in Table 9 by focusing on firms that can benefit more from donating, in the sense that they can better increase sales by using corporate philanthropy to increase their reputation and attract customers.

We find that, on average, donating firms that benefit less from the strategic benefits of donating experience 4.5% to 7.7% lower sales growth, relative to nondonors. These results are consistent with corporate philanthropy being a manifestation of agency problems, which leads to deterioration of firm performance. However, Column (1) shows that firms with a domestic customer and supplier bases can counter the decrease in sales growth by 3.6%, relative to internationally oriented firms. Similarly, we find in Column (2) that firms with high SG&A expenses—a proxy for marketing orientation—experience a 4.1% (= -6.3% - 1.2% + 3.4%) decrease in sales growth, whereas sales of those with low SG&A expenses

decrease by 6.3%. Column (3) does not find significant effects for high-R&D firms being able to increase sales by donating. This may be driven by the fact that these are typically firms in biotech or pharmaceutical industries, whose performance depends less on sales growth.

Column (4) finds that firms in more competitive industries can use donations to increase sales growth: whereas nondonors' sales decrease by 7.7%, donors' sales increase by 9.5%. Donors in positively affected industries also experience an increase in sales growth of 2.1%, relative to a decrease of 5.5% for firms in other industries (Column (5)). Finally, Column (6) shows that religiousness is not positively related to sales growth: donating firms in more religious countries have 2.1% lower sales growth, relative to those in less religious countries. Taken together, this is suggestive evidence that CARs reflect fundamental changes in future cash flows, rather than changes in investor sentiment, through attracting (or losing) customers. This corroborates the importance of reputation and social image enhanced by corporate philanthropy.

[Insert Table 9 about here]

4.2 Affected Firms

Although our focus on unaffected firms and our donation announcement analysis to a large extent alleviate the concern that we capture disaster-induced changes in the firm's operations, workforce, or customers, an investigation of firms located in affected areas provides a further important check for our identification strategy and our main findings. In Table 10, we include both affected and unaffected firms in the sample. Column 1 shows the result of regressing a dummy for firms in affected areas on the [-1,+21]-day disaster CARs. As natural disasters are more likely to affect operations and infrastructure for firms located in affected zip or postal codes, this should be reflected in shareholder returns. Even if operations are not directly affected from a physical point of view, sales and productivity may be limited because customers and employees are directly affected.[15]

[15] Including firms with affected customers and suppliers in the affected firms category does not materially affect our results.

We find that returns to firms in affected firms are indeed 1.2% lower, relative to firms in unaffected areas. In Column 2, we interact the affected indicator with the donations indicator. As the distribution of affected versus unaffected areas is exogenously determined and disasters are more salient to affected firms, this test provides a different setting for testing the cost-benefit trade-off of donating. Firms in affected areas can benefit from a wider range of strategic benefits, relative to unaffected firms: donating can signal their financial or operational resilience, provide resources to rebuild the local community (which includes firm employees and customers), and help the firm enhance its image with local stakeholders. This is reflected in Column 2, where we find—as before—that donations by firms in unaffected areas earn 1.4% more negative returns, relative to nondonating firms and that being located in an affected area lowers CARs by 1.4% for nondonors. Firms in affected areas that do donate, however, earn 8.7% (= 11.5% - 1.4% - 1.4%) higher returns, relative to nondonating, unaffected firms, potentially suggesting that these firms can benefit from signaling their resilience during a disaster.[16,17]

In Columns 3 and 4, we provide additional robustness checks by splitting the [-1,+21]-day event window in a short-term [0,+3]-day window around the disaster and a longer-term [+3,+21]-day window that captures firms' disaster-relief giving. Column 3 shows that affected firms earn 0.40% lower returns in the three-day window immediately following the disaster, whereas they do not earn significantly different returns in the [+3,+21]-day window (Column 4). Moreover, Columns 5 and 6 show that the disaster-induced effects for affected firms—as captured by the *Affected* indicator—are only significant in the short-term window (Column 5), whereas the donation-induced effects—as captured by the *D[Donations]* indicator—are significant in both event windows and become stronger in the longer-term window (Column 6). These

[16] An alternative explanation for the negative market reaction might be that it reflects investors' concerns regarding managers' overreaction to the perceived increase in salient risk of future natural disasters. Specifically, Dessaint and Matray (2017) find that firms in neighboring areas of the counties hit by natural disasters disproportionately increase their cash holdings and interpret this as managers overreacting to salient risks. If investors perceive disaster-relief giving as an overreaction to the perceived increase in disaster risk (as firms want to build reciprocity for future disasters), this further increases the costs associated with corporate giving. However, following Dessaint and Matray (2017), it is more plausible that overreacting managers of firms in unaffected areas hoard cash and do not donate at all.

[17] In additional tests, we find that affected donating firms in both positively affected industries and other industries earn significantly higher returns, relative to unaffected donors, although the effect is stronger for firms in positively affected industries. We also find that the positive returns to affected donors are driven almost completely by firms that are not financially constrained.

results strengthen our confidence that we are capturing market reactions to firms' disaster-relief giving rather than to the disaster event itself.

Panel B in Table 10 presents a control-group analysis based on firm proximity to the disaster by distinguishing firms in unaffected postal codes but affected administrative areas (state, county, or province) from firms in unaffected administrative areas. Unaffected firms in affected administrative areas are located closer to the disaster than firms in unaffected administrative areas and are therefore more likely to directly benefit from donating to affected communities. Column 1 in Panel B echoes the results in Column 2 of Panel A, as donating while being located in an affected administrative area significantly increases returns, but the effects are less pronounced. Consistent with the strategic benefits of donating being higher for firms closer to the disaster, Column 2 shows that donors in affected administrative areas earn 1.8% higher returns relative to nondonating firms. However, Columns 3 shows that firms in closer proximity experience some spillovers for larger disasters: returns from donating decrease as disaster severity increases. These effects are reversed for firms located farther away: donors in unaffected administrative areas earn 3.1% lower returns, relative to nondonors (Column 4), but the returns from donating increase by 0.9% as disaster severity increases (Column 5).

[Insert Table 10 about here]

4.3 Other Robustness Tests

4.3.1 Sample and Specification Changes

We perform additional robustness tests and report their results in Table 11. First, due to the coverage of Foundation Maps and the frequency of disasters, a large fraction of our sample consists of US-based firms. To rule out the possibility that all our results are driven by US firms. we split our sample into US firms and non-US firms in Columns (1) and (2), respectively. We find that our findings are sustained for US firms as well as non-US firms: in both samples, donating while unaffected is associated with decreases in shareholder value by 1.3% (US firms) and 2.2% (non-US firms).

Second, we rule out other explanations based on various unobservable factors at the industry and firm level. In Columns (3) and (4), we add four-digit SIC industry effects (instead of two-digit SIC fixed effects) and firm-level fixed effects to our main specification: in both tests, our main findings still hold, and they even become slightly more pronounced when adding firm fixed effects. We, however, choose not to include firm fixed effects in our main tests, as this eliminates a lot of the firm-level variation that is of interest for our analysis.

In addition, we want to ensure we are capturing firms' disaster-specific philanthropy, rather than their overall donating behavior. Therefore, in Column (5), we add control indicators for whether the firm engaged in corporate philanthropy in the year of the disaster, without requiring that these donations occurred around the disaster or were related to it. We obtain data on firms' annual donations from ASSET4 and find that our main findings remain strongly significant, indicating that we are not just capturing firms' overall propensity to donate, but rather disaster-specific donating behavior.

Column (6) investigates the extent to which firms' disaster-relief giving is unanticipated, given that stock market reactions should be stronger if the market did not anticipate it. We proxy for the novelty of disaster-relief giving by comparing donating firms that did not donate to the last large disaster in the firm's country to firms that donated for both disasters: disaster-relief giving should be less anticipated for the former type of firm. As expected, we find that the abnormal returns are driven primarily by the unanticipated donors.

Finally, Column (7) translates the CARs into their economic effects by calculating the dollar change in the firm's market value, subtracting the donated amount for donating firms. In contrast to the results based on CARs, donating in a disaster-relief setting on average increases firms' market value by $1.115 billion for small and medium-sized disasters. The effect becomes much more pronounced for larger, more salient disasters, however, with market value increasing further by $1.012 billion. If anything, these results indicate that our estimates based on CARs are a more conservative measure of the strategic benefits of donating: directly estimating the change in firms' market values over the [-1,+21] day window shows that the strategic benefits outweigh agency-related costs even following smaller, less salient disasters.

[Insert Table 11 about here]

4.3.2 Taxation

In additional robustness tests, we investigate the most obvious shareholder wealth-maximizing incentive for firms to donate: tax benefits. Although we do not expect tax effects to fully explain the wealth effects for disaster-relief giving, it is worth investigating whether the market values the tax-reducing effects. Firms can use charitable contributions to lower their taxable income, which can increase after-tax profits. Although Navarro (1988) argues that, for US firms, corporate taxes should not affect the level of corporate giving (because income tax proportionally reduces expected revenues and costs), there is some evidence that higher corporate tax rates relate positively to giving by company-sponsored foundations (Petrovits, 2006). In addition, our sample includes not only US firms but also non-US firms that are not subject to the same income tax system.

Appendix Table G supports the tax incentive: returns increase by 0.3% for every 10% increase in the effective tax rate (Column (1)). Donations by firms with negative effective tax rates are less likely to enhance shareholder value, as these firms cannot benefit from the reduction in taxable income. We indeed find, in Column (2), that donations by firms with negative effective tax rates earn returns insignificantly different from zero. Column (3) focuses on firms with high effective tax rates. We use an effective tax rate threshold of 35%, the federal corporate tax rate on marginal income in the United States,[18] based on the idea that virtually all firms can lower their effective tax rates in a variety of ways. Firms that cannot do so are likely among the highest tax-paying firms: a study by the Tax Foundation[19] finds that the worldwide average income tax rate is 23%, with the US having the 83rd highest corporate tax rate. Consistent with the taxation motive, we find that corporate philanthropy increases shareholder value for firms with high effective tax rates: post-disaster CARs are 1% higher for unaffected high-tax firms that donate, relative to

[18] The federal corporate tax rate was reduced to 21% following the 2017 Tax Cuts and Jobs Act. However, our sample period only has one year (2018) in which the lower tax rate was applicable.
[19] Asen, E., 2019. *Corporate Tax Rates around the World*, Tax Foundation.

those that do not. In fact, if donating is motivated by tax avoidance, this can also be consistent with the view of strategic philanthropy.

4.3.3 Non-Disaster Donations

We test whether our results only hold in a disaster-relief setting or whether they can be generalized to a nondisaster setting. Our conceptual framework on the merits of corporate philanthropy is applicable not only to disaster-relief giving but also to corporate philanthropy in general. However, as we cannot easily estimate shareholder value implications of donating without an event-study approach, we limit this analysis to the donation choice, rather than its value implications. In addition, Liang and Renneboog (2017) document a positive correlation between charitable donations and firm performance. Appendix Table H shows the results for a logit model, where the dependent variable is an indicator for whether the firm donated in year *t*; that is, we do not restrict firms' philanthropy to disaster-relief grant-giving. We find some evidence consistent with strategic philanthropy for firms with high SG&A expenses and firms in more religious countries in Columns (1) and (4). Column (5) includes all strategic proxies simultaneously and finds that having high SG&A expenses, high R&D expenses, and being in a competitive industry are all positively related to the likelihood of donating. Although these results echo those in Table 8, the results are less consistent. This is not surprising given that the salient environment of a natural disaster increases the strategic benefits and therefore the strategic incentive to donate. Columns (6) to (10) confirm the agency-motivated donations hypothesis and find that firms with more entrenched managers (Column (6)), low institutional ownership (Column (8)), and CEOs with greater pay slice (Column (9)) are more likely to donate.

4.3.4 Environmental Performance

Finally, one may argue that more environmentally conscious firms donate more to natural disasters caused by climate change. Appendices I.1 and I.2 investigate the role of firms' environmental performance in driving returns to corporate giving. Appendix I.1 interacts the donations indicator with firms' environmental

performance scores from ASSET4. Given that ASSET4 primarily covers large firms in a fixed set of countries, our sample size is reduced to 785 observations. Column (1) considers the environmental score, which consists of a firms' performance in terms of emissions and resource reductions and environmental R&D and ranges from -50 to +50, with 0 being the industry average. The results show that more environmentally friendly firms earn higher returns when donating, relative to less environmentally friendly firms: every unit increase in the environmental score increases returns from donating by 0.03%. The results for the components of the environmental score in Columns (2)–(4) show similar results: every unit increase in the emissions reductions score, resource reductions score, and environmental R&D score increase returns by 0.03%, 0.06%, and 0.06%, respectively. These results suggest that the market perceives donations by less environmentally conscious firms as less legitimate, limiting their strategic benefits.

Appendix I.2 investigates whether the effect of firms' environmental performance on donating behavior depends on the disaster type. Columns (1)–(3) investigate firms' incentives to donate following climate-induced disasters, such as floods or extreme storms, whereas Columns (4)–(6) consider nonclimate-induced disasters, such as earthquakes or hurricanes. The results show that, on average, firms are more likely to donate following both climate-induced and nonclimate-induced disasters. However, less environmentally friendly firms are less likely to donate following a climate-induced disaster, relative to more environmentally friendly firms. This result is not significant in the nonclimate-disaster sample, suggesting that firms strategically choose which disasters to donate to maximize the payoffs from donating.

4.3 Social Welfare Analysis

Our main results show that corporate disaster-relief giving by unaffected firms on average reduces shareholder value. However, corporate philanthropy can significantly increase firm and shareholder value when the relevance and saliency of the disaster increases the strategic and signaling value of giving. It is, however, an equally interesting question to consider the impact of corporate philanthropy on societal welfare as a whole, rather than on shareholder value alone. If disaster-relief giving on average lowers

shareholder value but creates more value to the society, it may still be worth pursuing from a policymaker's perspective.

Although a full analysis of the direct and indirect effects of philanthropy on societal welfare is outside the scope of this paper, we can perform a set of back-of-the-envelope calculations to give an idea of the societal impact of corporate disaster-relief giving. The median natural disaster in our sample causes approximately $1 billion USD in damages to property, crops, livestock, etc.[20] We can calculate that the median total amount donated to affected communities by corporations in our sample is about $5.4 million USD per disaster. This, however, only measures the direct benefits of donations and ignores any indirect compounding effects from increasing the living standards of affected communities: studies suggest that the social return of donating can be valued between 10% and 50% for the provision of in-kind benefits, such as housing, and 30% to 40% for pure cash donations (MacAskill, 2019).[21] In addition, to the extent cash donations are used to invest in measures that help prevent damage from future disasters (e.g., flood control), studies by Dedeurwaerdere (1998), the World Bank[22], and the US Geological Survey estimate that losses from natural disasters could be reduced by seven to even 30 times the investment costs. We can then estimate that the total direct and indirect effects of corporate giving on the society can range from $49 million up to $210 million USD.[23] The effect of donating on firms' market values depends strongly on where the firm is located: for firms located in affected areas, the market value impact of donating in the three weeks following the disaster is a positive $309 million USD, whereas donating firms in unaffected areas suffer a median loss of $203 million USD. However, our calculations indicate that these firm losses can to a certain extent be offset by an increase in social welfare to the community as a whole.

[20] There is, however, a caveat in that EM-DAT does not put a monetary value on human deaths or injuries; the total impact of the disaster is therefore likely underestimated.
[21] GiveWell, November 2018, https://www.givewell.org/international/technical/programs/cash-transfers#Whatreturnoninvestmentdocashtransferrecipientsearn
[22] World Disasters Report. 1999. West Chiltington, International Federation of Red Cross and Crescent Societies.
[23] This assumes a social return of 30%, as firms primarily make cash donations, on the 5.4$ million donated, multiplied by 7 and 30, respectively, in estimated prevented losses.

5. Conclusion

We study the role of corporate philanthropy in driving firm value for publicly listed companies around the world. We exploit natural disasters as large, salient events that affect the cost-benefit trade-off of corporate philanthropy and use an event-study setting to directly capture the value implications of corporate philanthropy. We find that whether corporate philanthropy and disaster-relief giving, in particular, is value-enhancing depends on the trade-off between agency costs and strategic benefits of donating. The strategic value of disaster-relief giving increases with the saliency of the disaster and the importance of reputation and social capital to the firm. More salient disasters are more attention-grabbing and offer more strategic opportunities from donating, and firms that rely more on their image and marketing stand to gain more from using corporate giving strategically. As such, donations become a more legitimate use of corporate funds from investors' perspective for more marketing-oriented firms and for donations following more salient disasters.

We find evidence for the above conjectures in a large international sample of 28,730 firms across 45 countries following 1,021 natural disasters around the world between 2006 and 2018. Specifically, we find that disaster-relief giving earns 0.50% lower cumulative abnormal returns (CARs) for firms in unaffected areas in the [-1,+21]-day window around the disaster, consistent with the agency-related costs of donating on average outweighing the strategic benefits. However, this negative effect is attenuated by the severity and relevance of the disaster as well as by the importance of social image to the firm. Larger disasters attract more attention and offer better opportunities for firms to benefit from publicity for their gifts and provide more legitimacy to the use of corporate funds for societal purposes. Similarly, the strategic benefits of donating are larger for more marketing-oriented firms as well as for firms in more competitive or in positively affected industries, in countries with less government disaster relief, and in more altruistic countries. Importantly, we find that these results remain when measuring abnormal returns in a [-1,+1] window around the disaster-relief announcement.

Overall, our results suggest philanthropy for disaster relief adds value for shareholders when firms can use corporate giving to build their reputations and social capital. Agency concerns are more important for

very small or excessively large donations and for donations made in cash. We offer a more holistic view of the nature and implications of corporate philanthropy, a fundamental issue in economics and corporate finance.

If one takes the evidence in this paper at face value, several ideas emerge for the improvement of social welfare and firm performance. As corporations around the world are increasingly engaging in corporate social responsibility in general and donating to disaster relief in particular, it is important to have a comprehensive understanding of the motivations and value implications. Our findings on the contextual factors, such as disaster size and type, donation size and type, and social norms, suggest that philanthropy by corporations should not be applied cookie-cutter style. Some corporate philanthropy is likely a manifestation of agency problems (Masulis and Reza, 2015; Cai, Xu, and Yang, 2020), and other efforts may trigger unfavorable market reactions if they do not comply with social norms.

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Figure 1: # Days between Disaster and Public Donation Announcement (N=692)

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 or newspaper articles.

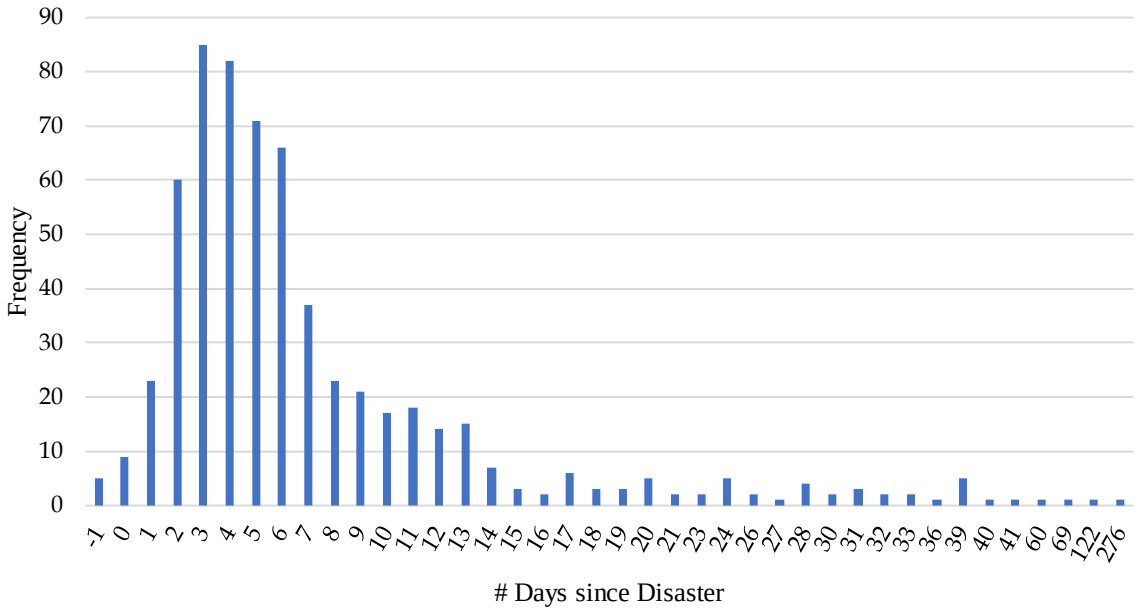

Figure 2: Geographic Sample Distribution (Disaster x Firm)

This figure shows the country distribution of our sample of 222,232 disaster-firm observations. Countries that are relatively more represented in our sample are indicated in darker shades.

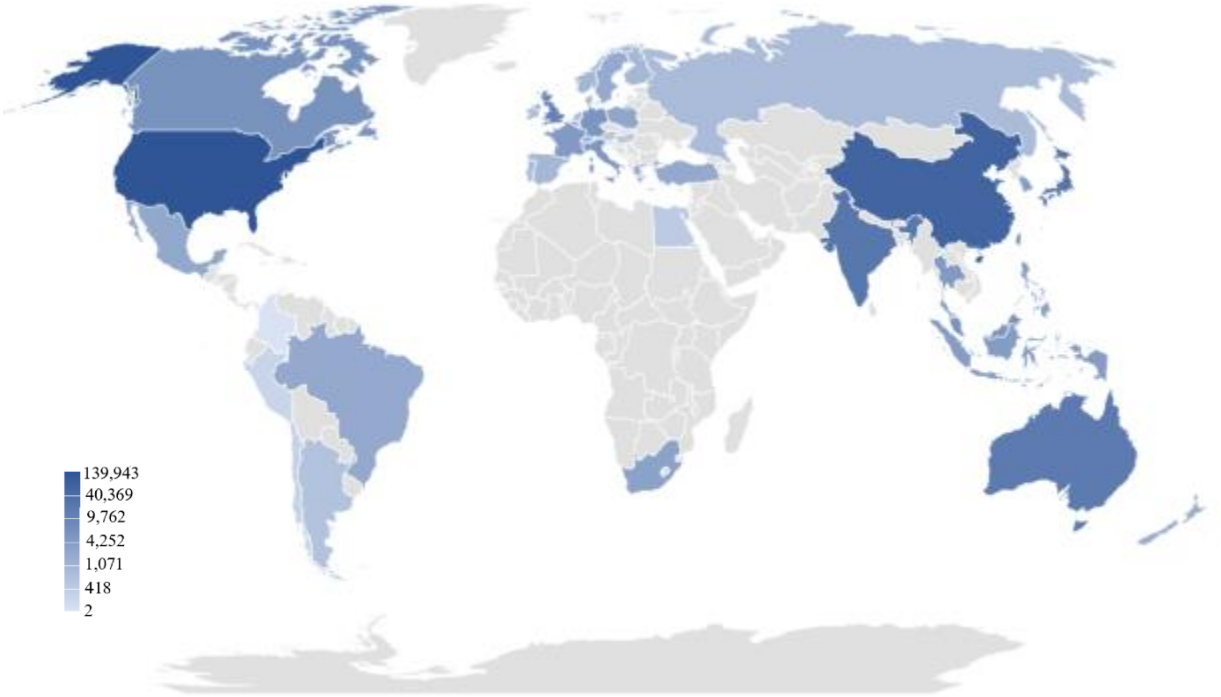

Table 1: Summary Statistics

Panels A and B show summary statistics for observations at the firm-disaster level, including all disasters and sudden disasters, respectively. 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.

Panel A: Full Sample

Variable	N	Mean	Std.Dev	Min	Max
CAR [-1,+21]	218,533	-0.001	0.171	-0.352	0.362
D[Disaster-Level Donation]	218,533	0.012	0.111	0	1.000
Disaster Size ($Mil)	218,533	2,054	4,520	56	30,000
Search Intensity	218,533	2.785	0.726	2.565	4.895
Small Disaster	218,533	0.206	0.405	0	1
Large Disaster	218,533	0.066	0.248	0	1
Total Assets ($Mil)	218,533	10,428	45,551	0.051	446,333
Market Value ($Mil)	218,533	2,535	15,266	0.027	79,0050
Sales/Assets	218,533	0.908	0.853	0	4.642
Intangibles/Assets	218,533	0.055	0.099	0	0.727
CapEx/Assets	218,533	0.043	0.047	0	0.462
EBIT/Assets	218,533	-0.064	0.305	-1	0.346
PPE/Assets	218,533	0.255	0.252	0	0.982
Effective Tax Rate	218,533	0.083	0.184	-0.318	0.754
D[Foreign Activities]	218,533	0.387	0.487	0	1
SG&A/Assets	218,533	0.348	0.340	0.007	0.951
R&D Expenses/Assets	218,533	0.018	0.053	0	0.260
HHI	218,533	0.028	0.056	0.005	0.727
Panel B: Sudden Disasters					
CAR [-1,+21]	52,536	0.001	0.176	-0.352	0.362
D[Disaster-Level Donation]	52,536	0.007	0.085	0	1
Disaster Size ($Mil)	52,536	4,042	7,614	56	30,000
Search Intensity	52,536	2.975	0.973	2.565	4.615
Small Disaster	52,536	0.272	0.445	0	1
Large Disaster	52,536	0.337	0.473	0	1
Total Assets ($Mil)	52,536	22,332	70,897	0.051	446,333
Market Value ($Mil)	52,536	1,638	10,332	0.001	79,0050
Sales/Assets	52,536	0.931	0.832	0	4.642
Intangibles/Assets	52,536	0.058	0.111	0	0.727
CapEx/Assets	52,536	0.046	0.056	0	0.462
EBIT/Assets	52,536	-0.033	0.261	-1	0.346
PPE/Assets	52,536	0.262	0.241	0	0.982
Effective Tax Rate	52,536	0.136	0.229	-0.318	0.755
D[Foreign Activities]	52,536	0.447	0.497	0	1
SG&A/Assets	52,536	0.282	0.372	0.005	0.941
R&D Expenses/Assets	52,536	0.015	0.042	0.000	0.211
HHI	52,536	0.027	0.054	0.005	0.727

Table 2: Donating vs Non-Donating Firms

This table summary statistics for subsamples of donors and nondonors in unaffected areas. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, 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 Table A.

	Donors					**Nondonors**					
Variable	Obs	Mean	Std.Dev	Min	Max	Obs	Mean	Std.Dev	Min	Max	*Difference*
CAR [-1,+21]	2,714	-0.011	0.111	-0.352	0.362	215,819	-0.001	0.171	-0.352	0.362	*0.010*
Disaster Size ($Mil)	2,714	2,167	4,750	60	30,000	215,819	2,054	4,520	56	30,000	*-113.743*
Search Intensity	2,714	2.851	0.005	2.565	4.895	215,819	2.784	0.002	2.565	4.615	*-0.067****
Small Disaster	2,714	0.206	0.008	0	1	215,819	0.236	0.001	0	1	*0.030****
Large Disaster	2,714	0.079	0.005	0	1	215,819	0.066	0.001	0	1	*-0.013***
Total Assets ($Mil)	2,714	22,042	46,917	0.051	446,333	215,819	10,282	45,515	0.051	446,333	*-11,760****
Market Value ($Mil)	2,714	21,435	52,674	0.023	790,050	215,819	2,297	14,020	0	737,467	*-19,156****
D[Financial Industry]	2,714	0.043	0.204	0	1	215,819	0.035	0.184	0	1	*-0.008***
Sales/Assets	2,714	1.006	0.883	0	4.642	215,819	0.907	0.852	0	4.642	*-0.099****
Intangibles/Assets	2,714	0.047	0.087	0	0.727	215,819	0.055	0.099	0	0.727	*-0.008*
CapEx/Assets	2,714	0.044	0.035	0	0.462	215,819	0.043	0.047	0	0.462	*-0.0005*
EBIT/Assets	2,714	0.095	0.164	-1	0.346	215,819	-0.067	0.306	-1	0.346	*-0.162****
PPE/Assets	2,714	0.377	0.289	0	0.982	215,819	0.254	0.251	0	0.981	*-0.123****
Effective Tax Rate	2,714	0.068	0.136	-0.318	0.755	215,819	0.083	0.185	-0.318	0.755	*0.014****
D[Foreign Activities]	2,714	0.369	0.483	0	1	215,819	0.388	0.487	0	1	*0.017**
SG&A/Assets	2,714	0.258	0.266	0.016	1.357	215,819	0.351	0.341	0.008	0.950	*-0.093****
R&D Expenses/Assets	2,714	0.004	0.024	0	0.450	215,819	0.038	0.045	0	0.889	*0.034****
HHI	2,714	0.028	0.069	0.005	0.727	215,819	0.028	0.056	0.005	0.727	*-0.001*
E-Index	2,714	0.392	1.000	0	5	215,819	0.055	0.397	0	5	*-0.337****

Table 3: Main Results – Unaffected Firm CARs around Disaster-Specific Donations

This table shows OLS estimations of regressing [-1,+21]-day CARs around a disaster on disaster-level donations dummy and other covariates. The main explanatory variables are indicators for whether unaffected firms provide disaster-specific donations (*D[Disaster-Level Donation]*) in Panel A, and the interaction between *D[Disaster-Level Donations]* and measures of disaster size (*Ln (Disaster Size)*, Search Intensity *(Ln (Google Web Searches))*, *D[Small Disaster]*, *D[Large Disaster]*) in Panel B. In Panel A, Column (1) considers all disasters, Column (2) considers large disasters (in terms of damage caused). Columns (2) and (3) investigate samples of long-term and sudden disasters, respectively. In Panel B, the sample consists of sudden disasters only. All specifications include a set of control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the firm's effective tax rate) as well as country x year FE, industry x year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Sudden vs Long-Term Disasters				
Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
D[Disaster-Level Donation]	-0.005*	-0.002***	-0.003	-0.013**
	(0.003)	(0.001)	(0.004)	(0.006)
D[Foreign Act.]	0.004***	0.005**	0.006***	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
EBIT/Assets	-0.005**	-0.005	-0.008***	0.008
	(0.002)	(0.003)	(0.002)	(0.007)
PPE/Assets	-0.012***	-0.028***	-0.015***	-0.004
	(0.002)	(0.007)	(0.002)	(0.003)
Size	0.001***	0.002***	0.001***	-0.001
	(0.000)	(0.000)	(0.000)	(0.001)
Effective Tax Rate	0.017	0.038***	0.031***	-0.002
	(0.000)	(0.009)	(0.011)	(0.004)
Observations	218,533	49,176	158,028	52,536
R-squared	0.042	0.078	0.047	0.071
Disasters Sample	All	Large	Long-Term	Sudden
Fixed Effects	Country x Year FE, Industry x Year FE, District FE			
Panel B: Disaster Size and Relevance				
Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
D[Disaster-Level Donation]	-0.091***	-0.067**	0.001	-0.018***
	(0.023)	(0.029)	(0.007)	(0.008)
Ln (Disaster Size)	0.000			
	(0.000)			
D[Disaster-Level Donation] × Ln (Disaster Size)	0.006***			
	(0.001)			
Ln(Search Intensity)		0.002		
		(0.001)		
D[Disaster-Level Donation] × Ln (Search Intensity)		0.017**		
		(0.007)		
D[Small Disaster]			0.001	
			(0.002)	
D[Small Disaster] × D[Disaster-Level Donation]			-0.069***	
			(0.007)	
D[Large Disaster]				0.0005
				(0.002)
D[Large Disaster] × D[Disaster-Level Donation]				0.018***
				(0.006)
Control Variables	D[Foreign Act.], EBIT/Assets, PPE/Assets, Firm Size, Eff. Tax Rate			
Fixed Effects	Country x Year FE, Industry x Year FE, District FE			
Observations	52,536	52,536	52,536	52,536
R-squared	0.129	0.129	0.129	0.129

Table 4: Abnormal Returns around Donation Announcement Dates

Panel A reports average CARs [-1,+1] around disaster-relief donation announcements in newspaper articles and press releases. Column (1) includes all disasters, Column (2) focuses on a sample of large disasters, and Columns (3) and (4) focus on long-term and sudden disasters, respectively. Panels B and C show OLS estimations for sudden disasters where the dependent variable is the [-1,+1] donation announcement CAR. The main independent variables in Panel B are disaster size in terms of dollar damage caused (Column (1)), the disaster's search intensity in Column (2), and indicators for small and large disasters in terms of damage caused in Columns (3) and (4). The independent variables in Panel C are indicators for CEO name references in Column 1, interacted with an indicator for an above-median donated amount and a high wage ratio in Columns 2 and 3, respectively. Column 4 interacts with an indicator for whether the donation was made to a well-known NGO. All specifications include a set of control variables as well as country × year fixed effects and industry × year fixed effects. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Univariate Statistics

	(1)	(2)	(3)	(4)
Disaster Type:	All	Large	Long-Term	Sudden
Mean Announcement CAR [-1,+1]	0.006*	0.007*	0.0005	0.007*
	(0.004)	(0.004)	(0.003)	(0.004)
	N=692	N=625	N=73	N=619

Panel B: Disaster Saliency	(1)	(2)	(3)	(4)
Ln (Disaster Size)	0.007*			
	(0.004)			
Ln (Google Web Searches)		0.006*		
		(0.004)		
D[Small Disaster]			-0.026**	
			(0.010)	
D[Large Disaster]				0.026**
				(0.010)
Control Variables	D[Foreign Act.], EBIT/Assets, PPE/Assets, Firm Size, Eff. Tax Rate			
Fixed Effects	Country × Year FE, Industry × Year FE			
Observations	619	619	619	619
R-squared	0.197	0.198	0.198	0.198

Panel C: CEO Reputation	(1)	(2)	(3)	(4)
D[CEO Name]	0.008***	0.028***	0.043***	-0.025***
	(0.001)	(0.010)	(0.001)	(0.008)
D[Donated Amount > Median]		-0.003		
		(0.004)		
D[CEO Name] x		-0.030*		
D[Donated Amount > Median]		(0.016)		
D[High CEO Wage Ratio]			-0.002	
			(0.002)	
D[CEO Name] x			-0.049***	
D[High CEO Wage Ratio]			(0.003)	
D[NGO]				0.022***
				(0.008)
D[CEO] x D[NGO]				0.035***
				(0.009)
Control Variables	D[Foreign Act.], EBIT/Assets, PPE/Assets, Firm Size, Eff. Tax Rate			
Fixed Effects	Country × Year FE, Industry × Year FE			
Observations	559	559	482	559
R-squared	0.225	0.210	0.239	0.211

Table 5: Testing the Strategic Motives of Disaster-Relief Giving

This table reports the results of regressing unaffected firms' [-1,+21]-day CARs around sudden disasters on a binary indicator for disaster-specific donations (*D[Disaster-Level Donation]*) interacted with a. an indicator for domestic-focused firms in Column (1), b. high SG&A expenses in Column (2), c. high R&D expenses in Column (3), d. positively affected industries in Column (4), and e. high HHI industries in Column (5). All specifications include a set of control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the effective tax rate) as well as country × year FE, industry × year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)	(5)
D[Disaster-Level Donation]	-0.021**	-0.022***	-0.015**	-0.018***	-0.017***
	(0.009)	(0.004)	(0.006)	(0.007)	(0.005)
Domestic Focus	-0.001				
	(0.001)				
D[Disaster-Level Donation]	0.012**				
× Domestic Focus	(0.006)				
High SG&A Expenses		0.002			
		(0.002)			
D[Disaster-Level Donation]		0.021*			
× High SG&A Expenses		(0.011)			
High R&D Expenses			-0.004		
			(0.003)		
D[Disaster-Level Donation]			0.045***		
× High R&D Expenses			(0.005)		
D[Disaster-Level Donation]				0.039***	
× Positively Affected Industry				(0.005)	
D[Disaster-Level Donation]					0.023***
× High HHI Industry					(0.008)
Control Variables	D[Foreign Act.], EBIT/Assets, PPE/Assets, Firm Size, Effective Tax Rate				
Fixed Effects	Country × Year FE, Industry × Year FE, District FE				
Observations	52,536	52,536	52,536	52,536	52,536
R-squared	0.129	0.129	0.129	0.129	0.123

Table 6: Testing the Role of Norms and Institutions

This table reports the results of regressing unaffected firms' [-1,+21]-day CARs around sudden disasters on a binary indicator for disaster-specific donations (*D[Disaster-Level Donations]*) interacted with a. an indicator for high other commercial and NGO grants/GDP in Column (1), b. high country-level sustainability in Column (2), c. high government disaster-relief grants in Column (3), and d. high religiousness in Column (4). All specifications include a set of control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the effective tax rate) as well as country × year FE, industry × year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
D[Disaster-Level Donation]	-0.009*	0.008***	0.044	-0.012**
	(0.005)	(0.002)	(0.033)	(0.005)
D[Disaster-Level Donation]	-0.033***			
× D[High Other Commercial & NGO Grants]	(0.011)			
D[Disaster-Level Donation]		-0.022***		
× D[High Country Sustainability Score]		(0.005)		
D[Disaster-Level Donation]			-0.063**	
× D[High Government Relief Grants]			(0.027)	
D[Disaster-Level Donation]				0.012**
× D[High Religiousness]				(0.006)
Control Variables	Yes	Yes	Yes	Yes
Country x Year Fixed Effects	Yes	Yes	Yes	Yes
Industry x Year Fixed Effects	Yes	Yes	Yes	Yes
District Fixed Effects	Yes	Yes	Yes	Yes
Observations	52,536	51,615	34,908	52,536
R-squared	0.129	0.106	0.129	0.129

Table 7: Testing the Determinants of Donating Propensity

This table shows marginal effects for logit estimations where the dependent variable is an indicator for whether the firm made disaster-specific donations, for a sample of unaffected firms around sudden disasters. The explanatory variables in Columns (1) to (5) are proxies for marketing-oriented firms (indicators for high SG&A expenses and R&D expenses, high HHI industry, high religiosity, and all of them, respectively). The explanatory variables in Columns (6) to (10) are proxies for potential agency-problem indicators (the firm's E-index, indicators for a high firm-level governance index, bottom-quartile institutional ownership, a high CEO wage ratio relative to the second-highest paid executive, and all of them, respectively). Control variables consist of indicators for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the firm's effective tax rate, year fixed effects. The sample is limited to firms with data availability for the MSCI governance index in Columns (7) and (10). Definitions of all variables are provided in Appendix A. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: *P(Donations)*	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)
Ln(Disaster Size)	0.002***				0.001***	E-Index	0.005***				0.011***
	(0.000)				(0.000)		(0.001)				(0.002)
High SG&A Expenses		0.006***			0.008***	Low Governance Index		0.009**			0.010**
		(0.001)			(0.001)			(0.004)			(0.004)
High R&D Expenses			-0.013***		-0.016***	Low Institutional Ownership			0.005***		-0.005
			(0.002)		(0.003)				(0.001)		(0.020)
High-HHI Industry				0.003**	0.005***	High CEO Wage Ratio				0.008**	0.011
				(0.001)	(0.002)					(0.002)	(0.007)
D[Foreign Act.]	-0.006***	-0.006***	-0.001***	-0.007	-0.005***	D[Foreign Act.]	-0.007***	-0.014***	-0.007***	-0.006	-0.013***
	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)		(0.001)	(0.004)	(0.001)	(0.014)	(0.004)
EBIT/Assets	0.046***	0.046***	-0.006**	0.052***	0.053***	EBIT/Assets	0.049***	0.213***	0.049***	0.211**	0.214***
	(0.005)	(0.005)	(0.002)	(0.005)	(0.006)		(0.005)	(0.023)	(0.005)	(0.095)	(0.023)
PPE/Assets	0.007***	0.007***	0.000	0.008***	0.007***	PPE/Assets	0.008***	0.025***	0.008***	0.011	0.025***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)		(0.001)	(0.006)	(0.001)	(0.025)	(0.006)
Size	0.002***	0.002***	0.004***	0.002***	0.004***	Size	0.002***	0.007***	0.002***	0.030***	0.007***
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)		(0.000)	(0.001)	(0.000)	(0.006)	(0.001)
Effective Tax Rate	-0.000*	-0.000*	-0.000	-0.000	-0.000	Effective Tax Rate	-0.000	-0.000	-0.000	-0.000	-0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	52,536	52,536	52,536	52,536	52,536	Observations	52,536	8,670	52,536	52,536	8,670
Control variables	Yes	Yes	Yes	Yes	Yes	Control variables	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Year FE	Yes	Yes	Yes	Yes	Yes

Table 8: The Effects of Donation Size and Type

This table shows OLS estimations where the dependent variable is the donating 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). The main explanatory variable in Column (3) is a binary indicator for whether the firm provides disaster-specific donations, interacted with an indicator for in-kind (donated products or equipment) donations. All specifications include a set of control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the firm's effective tax rate) as well as country × year FE, industry × year FE. Column (3) additionally includes district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Donation Size		***Donation Type***
Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)
Donations/Assets %	-0.006***	0.082***	
	(0.001)	(0.010)	
(Donations/Assets %)^2		-0.002***	
		(0.000)	
D[Disaster-Level Donation]			-0.014*
			(0.007)
D[Disaster-Level Donation] × D[Donated Products]			0.025***
			(0.008)
D[Foreign Act.]	-0.020	0.023	0.0004
	(0.016)	(0.014)	(0.001)
EBIT/Assets	0.055	0.045	0.008
	(0.042)	(0.036)	(0.007)
PPE/Assets	0.026	0.023	-0.003
	(0.026)	(0.025)	(0.003)
Size	-0.006**	-0.001	-0.0007
	(0.003)	(0.003)	(0.001)
Effective Tax Rate	0.007	0.002	-0.002
	(0.019)	(0.018)	(0.004)
Observations	325	325	52,536
R-squared	0.307	0.340	0.129
Industry × Year FE	Yes	Yes	Yes
District FE	No	No	Yes

Table 9: Sales Growth

This table shows OLS results where the dependent variable is a firm's sales growth from year t-1 before the disaster to year t. The main explanatory variable is a binary indicator of whether the firm provided disaster-relief donations in year t, which is interacted with an indicator for domestically focused firms in Column (1), high SG&A and R&D expenses in Columns (2) and (3), high HHI (Fama-French 48) industries in Column (4), positively affected industries in Column (5), and high religiousness countries in Column (6). All specifications control for foreign activities, EBIT/Assets, PPE/Assets, firm size, the firm's effective tax rate, as well as country × year FE, industry × year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var. : Sales Growth ($Sales_t/Sales_{t-1}$)	(1)	(2)	(3)	(4)	(5)	(6)
D[Disaster-Level Donation]	-0.072***	-0.063***	-0.047***	-0.077***	-0.055***	-0.048***
	(0.009)	(0.007)	(0.005)	(0.012)	(0.006)	(0.006)
Domestic Focus	0.007					
	(0.004)					
D[Disaster-Level Donation] × Domestic Focus	0.036***					
	(0.011)					
High SG&A Expenses		-0.012***				
		(0.004)				
D[Disaster-Level Donation] × High SG&A Expenses		0.034***				
		(0.013)				
High R&D Expenses			0.021***			
			(0.006)			
D[Disaster-Level Donation] × High R&D Expenses			-0.058			
			(0.077)			
High HHI Industry				0.022*		
				(0.012)		
D[Disaster-Level Donation] × High HHI Industry				0.150***		
				(0.035)		
D[Disaster-Level Donation] × Positively Affected Industry					0.076***	
					(0.009)	
D[Disaster-Level Donation] × High Religiousness						-0.021***
						(0.008)
Observations	49,334	49,334	49,334	49,334	49,334	48,253
R-squared	0.299	0.299	0.300	0.274	0.299	0.300
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE, District FE	Yes	Yes	Yes	Yes	Yes	Yes

Table 10: The Effects of Donations by Affected Firms around Disasters

This table reports OLS estimations where the dependent variable is the firm's [-1,+21]-day CAR in Columns (1) and (2) of Panel A, [0,+3]-day CAR in Columns (3) and (5), and its [+3,+21]-day CAR in Columns (4) and (6) following a sudden disaster. The dependent variable in Panel B is the firm's [-1,+21]-day CAR. The sample consists of both unaffected firms and firms located in affected zip- or postal codes in Panel A and Column 1 of Panel B. Columns 2 and 3 in Panel B consider firms in unaffected postal codes but affected administrative areas (states, counties, or provinces), and Columns 4 and 5 consider firms in unaffected administrative areas. The main explanatory variables are binary indicators for disaster-specific donations (*D[Disaster-Level Donation]*), for firms located in affected zip codes (*D[Affected]*) or affected administrative areas (*D[Affected Admin. Area]*), or their interaction. Columns 3 and 5 in Panel B interact the donations indicator with a proxy for disaster size (*Ln(Disaster Size)*). All specifications include a set of control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the firm's effective tax rate) as well as country x year FE, industry × year FE, and district FEs. Column 3 additionally includes district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Dep. Var.:	CAR[-1,+21]	CAR[-1,+21]	CAR[0,+3]	CAR[+3,+21]	CAR[0,+3]	CAR[+3,+21]
D[Disaster-Level Donation]		-0.014**			-0.004***	-0.050**
		(0.007)			(0.001)	(0.020)
D[Affected]	-0.012***	-0.014***	-0.004***	-0.006	-0.004***	-0.007
	(0.004)	(0.004)	(0.001)	(0.007)	(0.001)	(0.007)
D[Disaster-Level Donation] ×		0.115***			0.036***	0.155***
D[Affected]		(0.017)			(0.006)	(0.042)
Control Variables	D[Foreign Act.], EBIT/Assets, PPE/Assets, Firm Size, Effective Tax Rate					
Country × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	53,388	53,388	49,026	49,026	49,026	49,026
R-squared	0.128	0.128	0.099	0.071	0.099	0.071

Panel B: Affected vs Unaffected Administrative Areas

Dep. Var.: CAR[-1,+21]	(1)	(2)	(3)	(4)	(5)
Sample	*All*	*Affected Admin.*	*Affected Admin.*	*Unaffected Admin.*	*Unaffected Admin.*
D[Disaster-Level Donation]	-0.029***	0.018***	0.105***	-0.031***	-0.160**
	(0.008)	(0.002)	(0.016)	(0.003)	(0.078)
D[Affected Administrative Area]	-0.006***				
	(0.000)				
D[Disaster-Level Donation] x	0.045***				
D[Affected Administrative Area]	(0.008)				
Ln(Disaster Size)			-0.003***		0.000
			(0.000)		(0.000)
D[Disaster-Level Donation] x			-0.006***		0.009*
Ln(Disaster Size)			(0.001)		(0.005)
Control Variables	D[Foreign Act.], EBIT/Assets, PPE/Assets, Firm Size, Eff. Tax Rate				
Country x Year FE	Yes	Yes	Yes	Yes	Yes
Industry x Year FE	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes
Observations	52,536	9,425	9,425	42,984	42,984
R-squared	0.129	0.090	0.090	0.164	0.164

Table 11: Other Robustness Tests

This table shows OLS estimations where the dependent variable is the firm's [-1,+21]-day CAR following a disaster (Columns 1-6) or the economic effect in Column 7, calculated as the CAR × the firm's market capitalization and subtracting the donated amount. The main explanatory variable is a binary indicator for whether the firm provides disaster-specific donations. The sample consists of US firms in Column (1) and of non-US firms in Column (2). Columns (3)-(5) include the full sample. Column (5) additionally controls for the firm's non-disaster specific donations, and Column (6) interacts the donations indicator with an indicator for unanticipated donations. Column (7) interacts the donations indicator with an indicator for large disasters. All specifications include a set of control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the firm's effective tax rate) as well as country × year FE, industry × year FE, and district FE. Column 3 measures industry FE at the 4-digit SIC level, Column (4) additionally includes firm fixed effects. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.:	*CAR [-1,+21]*						*MV Change ($m)*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
D[Disaster-Level Donation]	-0.013**	-0.022***	-0.015**	-0.024***	-0.013***	-0.005	1.112***
	(0.005)	(0.008)	(0.006)	(0.002)	(0.007)	(0.007)	(0.138)
D[Annual Donations]					-0.001		
					(0.003)		
D[Unanticipated Donor]						-0.014***	
						(0.004)	
D[Large Disaster]							-0.045**
							(0.019)
D[Disaster-Level Donation] × D[Large Disaster]							1.013**
							(0.392)
Observations	21,189	31,317	52,536	44,652	52,536	52,536	19,636
R-squared	0.105	0.220	0.153	0.389	0.129	0.129	0.241
Sample	US Firms	Non-US Firms	All	All	All	All	All
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	SIC4	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	No	Yes	Yes	Yes
Firm FE	No	No	No	Yes	No	No	No

ONLINE APPENDIX

Appendix A: Variable Definitions

CAR [-1,+21]	Cumulative abnormal returns in days -1 to +21 around the disaster event, benchmarked relative to country-level CAPM returns.
CAR[-1,+1]	Cumulative abnormal returns in days -1 to +1 around the disaster-relief grant announcement, benchmarked relative to country-level CAPM returns.
D[Disaster-Level Donation]	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.*
Donations/Assets	Ratio of disaster-specific donations to total assets if the firm donated, left missing otherwise. *Source: Foundation Maps.*
Donated Products	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.*
Size (ln assets)	Firm size calculated as the log of total assets. *Source: Datastream and Compustat Global.*
Affected	Dummy equal to one if the firm is headquartered in a zip code affected by the disaster. *Source: EM-DAT.*
Total Assets ($Mil)	The firm's total assets in the year of the disaster, in millions of USD. *Source: Datastream and Compustat Global.*
Market Value ($Mil)	The market value of the firm, in millions of USD. *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.*
EBIT/Assets	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.*
CEO Name	A dummy equal to one if the CEO is referred to by name in a firm's disaster-relief press release or newspaper article announcement. *Source: press releases.*
NGO	A dummy equal to one if the donation was made to a large NGO, including the Red Cross, UNICEF, Doctors Without Borders, AmeriCares, and the Salvation Army. *Source: press releases.*
Affected Administrative Area	A dummy equal to one if a firm is located in an administrative area (county, state, or province) affected by the disaster, but in an unaffected zip- or postal-code. *Source: EM-DAT and Compustat Global.*
Sales Growth	The change in total sales from year *t-1* before the disaster to year *t*. *Source: Datastream and Compustat Global.*
High-HHI Industry	A dummy equal to one if the firm is in an industry (Fama-French 48) with an above-average HHI index, and zero otherwise. *Source: ASSET4.*
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: ASSET4.*

Foreign Act.	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.*
D[Annual Donations]	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: ASSET4.*
Disaster Damage ($ '000s)	The total value in damages attributed to the disaster, measured in thousands of USD. *Source: EM-DAT.*
Small Disaster	A dummy equal to one if the total value in damages attributed to the disaster is <= 2 million USD (25th percentile). *Source: EM-DAT.*
Medium Disaster	A dummy equal to one if the total value in damages attributed to the disaster is > 2 million USD (25th percentile) and <= 1.8 billion USD (75th percentile). *Source: EM-DAT.*
Large Disaster	A dummy equal to one if the total value in damages attributed to the disaster is > 1.8 billion USD (75th percentile). *Source: EM-DAT.*
Search Intensity	The natural logarithm of the number of monthly web searches in Google for disaster-related terms, including "hurricane", "earthquake", "tsunami", "landslide", "cyclone", etc. *Source: Google Trends.*
Total Deaths	The number of human deaths caused by the disaster. *Source: EM-DAT.*
Positively Affected Industry	Dummy equal to one if the firm is in one of the following industries: Construction (SIC 15-17), Commercial Banks, Savings and Credit Institutions, Loan Brokers, Finance Services (SIC 60-62), Wholesale Trade Durables (SIC 50), Health & Legal Services (SIC 80-81), and Public Administration (SIC 91-98).
Sudden Disaster	Dummy equal to one if the disaster was a flash flood, earthquake, tropical cyclone, landslide, volcanic activity, or tsunami. *Source: EM-DAT.*
Long Disaster	Dummy equal to one if the disaster was a drought, extreme winter conditions, extreme temperatures, heat wave, or a cold wave. *Source: EM-DAT.*
Below-Average Governance Index	Dummy equal to one if the firm has a below-average governance index. *Source: MSCI Governance.*
Above-Average Other Grants/GDP	Dummy equal to one if a country has an above-average share of disaster-relief giving by non-corporate and non-governmental charities as a fraction of GDP. *Source: Foundation Maps.*
Above-Average Sustainability Score	Dummy equal to one if a country has an above-average sustainability score, capturing rules and regulations with regards to a country's environmental and social policies. *Source: Vigeo.*
Above-Average Government Relief Grants	Dummy equal to one if a country's government provided an above-average amount of disaster-relief funding as a fraction of GDP. *Source: OECD.*
Above-Average Religiousness	Dummy equal to one if the country has an above-average percentage of people that visit religious institutions more than once a week. *Source: World Value Surveys.*
Family Firm	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	Dummy equal to one if the firm has above-average institutional ownership. *Source: Factset.*
% Domestic > % Foreign Inst. Own.	Dummy equal to one if the percentage of domestic institutional owners is larger than the percentage of foreign institutional owners. *Source: Factset.*
High CEO Wage Ratio	Dummy equal to one if the ratio of the CEO's wage to the second highest-paid executive is above the sample average. *Source: Execucomp.*
Unanticipated Donor	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.*

MV Change ($m)	The change in the firm's market capitalization in the [-1,+21] event window, subtracting the donated amount for donating firms. *Source: own calculations.*
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.*
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 the industry average. *Source: ASSET4.*
Emissions Reductions Score	A firm's emissions reductions score, measuring a firm's effectiveness in reducing emissions in its production and operational processes, relative to its industry peers. The score ranges from -50 to +50, with 0 the industry average. *Source: ASSET4.*
Resource Reductions Score	A firm's resource reductions score, measuring a firm's effectiveness in using natural resources in its operational and production processes, relative to its industry peers. The score ranges from -50 to +50, with 0 the industry average. *Source: ASSET4.*
Environmental R&D Score	A firm's environmental R&D score, measuring a firm's performance in terms of supporting the research and development of eco-efficient products or services, relative to its industry peers. The score ranges from -50 to +50, with 0 the industry average. *Source: ASSET4.*

Appendix B: Disaster Sample Distribution

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

Country	# Disasters	Country	# Disasters
United Arab Emirates	1	Kazakhstan	1
Argentina	6	South Korea	10
Australia	40	Luxembourg	2
Austria	7	Macau	1
Belgium	4	Mexico	22
Bahamas	2	Mauritius	1
Belize	2	Malaysia	5
Brazil	20	Nigeria	1
Canada	15	Netherlands	4
Switzerland	6	Norway	1
Chile	12	New Zealand	10
China	258	Pakistan	2
Colombia	5	Panama	1
Cayman Islands	1	Peru	4
Czech Republic	1	Philippines	29
Germany	17	Papua New Guinea	1
Denmark	2	Poland	4
Dominican Republic	1	Portugal	9
Egypt	1	Russia	10
Spain	9	Singapore	1
Finland	1	Solomon Islands	2
France	14	Sweden	1
United Kingdom	17	Thailand	15
Ghana	1	Turkey	6
Greece	6	Taiwan	11
Hong Kong	1	Ukraine	1
Hungary	2	Uruguay	1
Indonesia	25	United States	237
India	58	British Virgin Islands	1
Ireland	1	Vietnam	2
Italy	29	South Africa	12
Japan	48	**Total**	**1,021**

Appendix C1: Univariate Statistics: Affected vs Unaffected Firms Based on Postal Codes

This table summary statistics for subsamples of firms in affected and unaffected areas, defined at the postal code level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, 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 Table A.

	Affected Postal Code					*Unaffected Postal Code*					
Variable	N	Mean	Std.Dev.	Min	Max	N	Mean	Std.Dev.	Min	Max	*Difference*
CAR [-1,+21]	3,048	-0.015	0.015	-0.352	0.362	218,533	0.0002	0.001	-0.352	0.362	*0.015*
D[Disaster-Level Donation]	3,048	0.011	0.105	0	1.000	218,533	0.012	0.111	0	1.000	*0.001*
Total Assets ($Mil)	3,048	10,461	48,122	0.051	446,333	218,533	10,428	45,551	0.051	446,333	*-32.690*
Market Value ($Mil)	3,048	2,788	13,949	0.027	217,613	218,533	2,535	15,266	0.027	79,0050	*-252.989*
Sales/Assets	3,048	0.837	0.904	0	4.642	218,533	0.908	0.853	0	4.642	*0.071****
Intangibles/Assets	3,048	0.073	0.124	0	0.727	218,533	0.055	0.099	0	0.727	*-0.018****
EBIT/Assets	3,048	-0.097	0.331	-1	0.346	218,533	-0.064	0.305	-1	0.346	*0.032****
PPE/Assets	3,048	0.236	0.267	0	0.982	218,533	0.255	0.252	0	0.982	*0.020****
Effective Tax Rate	3,048	0.082	0.189	-0.318	0.755	218,533	0.083	0.184	-0.318	0.754	*0.001*
D[Foreign Activities]	3,048	0.380	0.485	0	1	218,533	0.387	0.487	0	1	*0.007*
SG&A/Assets	3,048	0.379	0.371	0.008	0.950	218,533	0.348	0.340	0.007	0.951	*-0.031****
R&D Expenses/Assets	3,048	0.016	0.053	0	0.260	218,533	0.018	0.053	0	0.260	*0.002***

Appendix C2: Univariate Statistics: Affected vs Unaffected Firms Based on Administrative Areas (Sudden Disasters)

This table summary statistics for subsamples of firms in affected and unaffected areas, defined at the administrative area level. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, 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 Table A.

	Unaffected Admin. Area					*Affected Admin. Area*					
Variable	N	Mean	Std.Dev.	Min	Max	N	Mean	Std.Dev.	Min	Max	*Difference*
CAR [-1,+21]	42,984	0.001	0.166	-0.364	0.388	9,425	-0.003	0.200	-0.364	0.388	*-0.004*
D[Disaster-Level Donation]	42,984	0.005	0.073	0	1	9,425	0.012	0.110	0	1	*0.006****
Total Assets ($Mil)	42,984	30,381	85,063	0.051	446,333	9,425	14,747	58,488	0.051	446,333	*-15,634****
Market Value ($Mil)	42,984	1,447	9,285	0.001	790,050	9,425	2,334	12,460	0.001	399,535	*887*
Sales/Assets	42,984	0.924	0.826	0	4.642	9,425	1.021	0.902	0	4.642	*0.097****
Intangibles/Assets	42,984	0.058	0.114	0	0.727	9,425	0.050	0.086	0	0.727	*-0.008****
EBIT/Assets	42,984	-0.015	0.230	-1	0.346	9,425	-0.073	0.317	-1	0.346	*-0.058****
PPE/Assets	42,984	0.278	0.239	0	0.982	9,425	0.244	0.253	0	0.982	*-0.034****
Effective Tax Rate	42,984	0.104	0.154	-0.318	0.754	9,425	0.091	0.184	-0.318	0.754	*-0.013*
D[Foreign Activities]	42,984	0.511	0.500	0	1	9,425	0.290	0.454	0	1	*-0.221****
SG&A/Assets	42,984	0.348	0.340	-0.026	0.951	9,425	0.348	0.340	0	0.951	*-0.000*
R&D Expenses/Assets	42,984	0.064	0.053	-0.005	0.260	9,425	0.054	0.018	0	0.260	*-0.010***
HHI	42,984	0.028	0.060	0.005	0.728	9,425	0.027	0.056	0.005	0.728	*0.001*

Appendix D: Disaster-Related Deaths

This table shows OLS estimations investigating [-1,+21]-day CARs around a sudden disaster. The main explanatory variables are indicators for whether unaffected firms provide disaster-specific donations, interacted with measures of disaster size in terms of deaths caused. All specifications include a set of control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the firm's effective tax rate) as well as country × year FE, industry × year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)
D[Disaster-Level Donation]	-0.036***	-0.001	-0.019**
	(0.007)	(0.008)	(0.008)
Ln (Disaster-Related Deaths)	0.000		
	(0.000)		
D[Disaster-Level Donation] × Ln (Disaster-Related Deaths)	0.009***		
	(0.001)		
D[Total Deaths Q1]		-0.002	
		(0.002)	
D[Disaster-Level Donation] × D[Total Deaths Q1]		-0.043***	
		(0.007)	
D[Total Deaths Q4]			0.001
			(0.001)
D[Disaster-Level Donation] × D[Total Deaths Q4]			0.015**
			(0.006)
Observations	52,536	52,536	52,536
R-squared	0.129	0.129	0.129
Control Variables	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Appendix E: Disaster CARs: Agency Channel and US Subsample

This table regresses unaffected firms' [-1,+21]-day CARs around sudden disasters on an indicator for disaster-specific donations, interacted with proxies for firm governance in Panel A, and proxies for disaster saliency in Panel B. Panel A uses the full sample, Panel B focuses on a subsample of US firms. Proxies for governance in Panel A are an indicator for a below-average governance index in Column 1, bottom-quartile institutional ownership in Column 2, and the E-index in Column 3. Proxies for disaster saliency are disaster size and search intensity in Columns 1 and 2, and dummies for small and large disasters in Columns 3 and 4. All specifications control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the effective tax rate) as well as (country ×)year FE, industry × year FE, and district or state FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district/state. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Panel A: Agency Channel. Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)
D[Disaster-Level Donation]	0.017***	-0.011*	-0.009***
	(0.003)	(0.006)	(0.002)
Low Governance Index	-0.002		
	(0.002)		
D[Disaster-Level Donation] × Low Governance Index	-0.023***		
	(0.008)		
Low Institutional Ownership		0.0005	
		(0.002)	
D[Disaster-Level Donation] × Low Institutional Ownership		-0.066**	
		(0.027)	
E-Index			0.001
			(0.001)
D[Disaster-Level Donation] x E-Index			-0.004***
			(0.001)
Observations	9,768	52,536	52,536
R-squared	0.104	0.129	0.129
Control Variables	Yes	Yes	Yes
Fixed Effects	Country x Year FE, Industry x Year FE, District FE		

Panel B: US Subsample	(1)	(2)	(3)	(4)
D[Disaster-Level Donation]	-0.082***	-0.042**	0.001	-0.018***
	(0.018)	(0.017)	(0.006)	(0.006)
Ln (Disaster Size)	0.000			
	(0.000)			
D[Disaster-Level Donation] × Ln (Disaster Size)	0.005***			
	(0.001)			
Ln(Search Intensity)		0.004		
		(0.003)		
D[Disaster-Level Donation] × Ln (Search Intensity)		0.009*		
		(0.005)		
D[Small Disaster]			0.001	
			(0.004)	
D[Small Disaster] × D[Disaster-Level Donation]			-0.105***	
			(0.010)	
D[Large Disaster]				-0.002
				(0.001)
D[Large Disaster] × D[Disaster-Level Donation]				0.017***
				(0.005)
Control Variables	Yes	Yes	Yes	Yes
Fixed Effects	Year FE, Industry x Year FE, State FE			
Observations	21,189	21,189	21,189	21,189
R-squared	0.105	0.105	0.105	0.105

Appendix F: 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 (D[Disaster-Level Donation]), interacted with an indicator for family firms (Column (1)) and an indicator for large disasters (Column (2)), where the sample in Column only includes family firms. Columns (3) and (4) interact the disaster donation indicator with institutional ownership variables (high total ownership in Column (3), higher domestic than foreign ownership in Column (4)). All specifications include control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the effective tax rate) as well as country × year FE, industry × year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)	(4)
D[Disaster-Level Donation]	0.007*	0.048***	-0.063**	-0.044**
	(0.004)	(0.009)	(0.027)	(0.021)
D[Family Firm]	0.001			
	(0.002)			
D[Disaster-Level Donation] ×	0.004**			
D[Family Firm]	(0.002)			
D[Large Disaster]		-0.003		
		(0.003)		
D[Disaster-Level Donation] ×		0.021*		
D[Large Disaster]		(0.011)		
D[High Institutional Ownership]			-0.006*	
			(0.003)	
D[Disaster-Level Donation] ×			0.065***	
D[High Institutional Ownership]			(0.025)	
D[% Domestic > % Foreign Inst. Ownership]				-0.003
				(0.003)
D[Disaster-Level Donation] ×				0.049**
D[% Domestic > % Foreign Inst. Ownership]				(0.020)
Control Variables	Yes	Yes	Yes	Yes
Country Fixed Effects	Yes	Yes	No	No
Industry Fixed Effects	Yes	Yes	No	No
Year Fixed Effects	Yes	Yes	No	No
Country × Year Fixed Effects	No	No	Yes	Yes
Industry × Year Fixed Effects	No	No	Yes	Yes
District Fixed Effects	Yes	Yes	Yes	Yes
Observations	3,377	539	21,112	21,112
R-squared	0.101	0.225	0.223	0.222

Appendix G: Robustness Tests: Tax Motive

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 is an indicator for whether the firm provides disaster-specific donations, as well as the firm's effective tax rate (interacted in Column 1). Column 1 considers the full sample of unaffected firms, Column 2 considers only firms with negative effective tax rates, and Column 3 includes only firms with effective tax rates > 35%. All specifications include a set of control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the firm's effective tax rate) as well as country × year FE, industry × year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: CAR [-1,+21]	(1)	(2)	(3)
D[Disaster-Level Donation]	-0.017***	-0.0004	0.010*
	(0.006)	(0.005)	(0.006)
Effective Tax Rate	-0.002		
	(0.007)		
D[Disaster-Level Donation] x Effective Tax Rate	0.031**		
	(0.015)		
Observations	52,536	21,132	7,836
R-squared	0.129	0.081	0.232
Sample	All	Eff. Tax ≤ 0	Eff. Tax > 35%
Control variables	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes

Appendix H: Probability of Donating, Non-Disaster Donations (ASSET4)

This table shows marginal effects for logit estimations where the dependent variable is an indicator for whether the firm donated in year *t*. The explanatory variables are proxies for marketing-oriented firms in Columns 1 to 5 (indicators for above-average SG&A expenses and R&D expenses, an above-average HHI industry, and above-average religiosity, respectively), and proxies for potential agency issues in Columns 6 to 10 (the firm's E-index, indicators for a below-average firm-level governance index, bottom-quartile institutional ownership, and an above-average CEO wage ratio relative to the second-highest paid executive, respectively). Control variables consist of indicators for foreign activities, EBIT/Assets, Leverage, firm size, and the firm's effective tax rate, as well as year fixed effects. The sample is limited to firms with data availability for the MSCI governance index in Column 7. Definitions of all variables are provided in Appendix A. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: *P(Donations)*	(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)	(9)	(10)
High SG&A Expenses	0.008***				0.009***	E-Index	0.017***				0.045***
	(0.001)				(0.001)		(0.0003)				(0.001)
High R&D Expenses		-0.001			0.002*	Low Governance Index		-0.008***			-0.010***
		(0.001)			(0.001)			(0.003)			(0.003)
High HHI Industry			0.002		0.004**	Low Institutional Ownership			0.023***		0.035***
			(0.002)		(0.002)				(0.001)		(0.009)
High Religiosity				0.037***	-0.009***	High CEO Wage Ratio				0.004***	0.011***
				(0.004)	(0.001)					(0.001)	(0.003)
D[Foreign Act.]	0.009***	0.008***	0.008***	0.004***	0.007***	D[Foreign Act.]	0.007***	0.018***	0.011***	0.007***	0.018***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)		(0.0008)	(0.003)	(0.0008)	(0.0008)	(0.003)
EBIT/Assets	0.080***	0.085***	0.084***	0.115***	0.083***	EBIT/Assets	0.064***	0.253***	0.094***	0.08***	0.210***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)		(0.005)	(0.021)	(0.005)	(0.005)	(0.020)
Leverage	-0.019***	-0.021***	-0.021***	-0.013***	-0.018***	Leverage	-0.013***	-0.038***	-0.002	-0.020***	-0.025***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)		(0.002)	(0.009)	(0.002)	(0.002)	(0.009)
Effective Tax Rate	0.003	0.003	0.003	0.009***	0.001	Effective Tax Rate	0.002	0.018*	-0.007***	0.002	0.014
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)		(0.003)	(0.011)	(0.002)	(0.003)	(0.011)
Size	0.021***	0.021***	0.021***	0.021***	0.021***	Size	0.016***	0.068***	0.019***	0.02***	0.056***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.0002)	(0.001)	(0.0002)	(0.0002)	(0.0009)
Observations	106,417	106,417	106,417	106,417	106,417	Observations	106,417	27,254	106,417	106,417	27,254
Year FE	Yes	Yes	Yes	Yes	Yes	Year FE	Yes	Yes	Yes	Yes	Yes

Appendix I.1: Corporate Giving and Environmental Performance

This table shows regresses unaffected firms' [-1,+21]-day CARs around sudden disasters on an indicator for disaster-specific donations, interacted with proxies for firms' environmental-friendliness. Column 1 measures the firm's environmental score, ranging from -50 to +50 where 0 is the industry average. The environmental score consists of the firm's performance in terms of emissions reductions, resource reductions, and environmental R&D. Column 2 measures the firm's emissions reductions score, Column 3 measures the resource reductions score, and Column 4 measures the environmental R&D score. All specifications control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the effective tax rate) as well as country × year FE, industry × year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: CAR[-1,+21]	(1)	(2)	(3)	(4)
D[Disaster-Level Donation]	-0.039***	-0.042***	-0.047***	-0.048***
	(0.003)	(0.003)	(0.004)	(0.004)
Environmental Score	-0.0002			
	(0.0002)			
D[Disaster-Level Donation] × Environmental Score	0.0003*			
	(0.0001)			
Emissions Reductions Score		-0.0001		
		(0.0002)		
D[Disaster-Level Donation] × Emissions Reductions Score		0.0003**		
		(0.0001)		
Resource Reductions Score			-0.0002	
			(0.0001)	
D[Disaster-Level Donation] × Resource Reductions Score			0.0006***	
			(0.0002)	
Environmental R&D Score				0.0002
				(0.0002)
D[Disaster-Level Donation] × Environmental R&D Score				0.0006***
				(0.0001)
Observations	785	785	785	785
R-squared	0.324	0.324	0.325	0.325
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

Appendix I.2: Likelihood of Donating and Environmental Performance, Large Disaster Subsamples

This table estimates the likelihood of donating in an OLS setting for subsamples of climate-related (e.g. flash floods, storms, fires, and tornadoes, Columns 1-3) and non-climate related (e.g. earthquakes, hurricanes, volcanic activity, Columns 4-6) sudden disasters. The independent variables are indicators for above-average firm-level environmental (Columns 1 and 4), emissions reductions (Columns 2 and 5), and resource reductions scores (Columns 3 and 6), interacted with indicators for post-disaster periods. The post-disaster indicator is based on the first large disaster that occurred in the sample period. All specifications control variables (indicator for foreign activities, EBIT/Assets, PPE/Assets, firm size, and the effective tax rate) as well as country × year FE, industry × year FE, and district FE. Definitions of all variables are provided in Appendix A. Standard errors are clustered by district. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dep. Var.: P(Disaster-Level Donation)	Climate-Related Disaster			Non-Climate-Related Disaster		
	(1)	(2)	(3)	(4)	(5)	(6)
D[Below-Average Environmental Score]	-0.017**			-0.034**		
	(0.006)			(0.015)		
D[Post-Disaster]	0.108***	0.095***	0.106***	0.067***	0.057**	0.069***
	(0.014)	(0.014)	(0.012)	(0.026)	(0.027)	(0.026)
D[Below-Average Environmental Score] ×	-0.051***			-0.032		
D[Post-Disaster]	(0.006)			(0.025)		
D[Below-Average Emissions Reductions Score]		-0.036***			-0.049***	
		(0.003)			(0.018)	
D[Below-Average Emissions Reductions Score] ×		-0.028**			-0.032	
D[Post-Disaster]		(0.010)			(0.025)	
D[Below-Average Resource Reductions Score]			-0.015*		-0.013	-0.025
			(0.007)		(0.027)	(0.019)
D[Below-Average Resource Reductions Score] ×			-0.046***			-0.032
D[Post-Disaster]			(0.014)			(0.028)
Observations	5,857	5,857	5,857	5,685	5,685	5,685
R-squared	0.217	0.217	0.216	0.217	0.217	0.216
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Country × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes	Yes	Yes

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