Institutional Disruptions and the Philanthropy of Multinational Firms

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ABSTRACT

This paper studies philanthropic giving by multinational enterprises (MNEs) during severe, unexpected, and systemic breakdowns in economic institutions. We suggest that the key drivers of giving differ from widely accepted factors explaining philanthropy under stable institutional contexts. Our central argument is that, under institutional disruptions, MNEs aim to restore goods that are essential for market operation, such as infrastructure and labor markets, and the strength of this motive rises in the economic importance of the affected country to the MNE. We constructed the Global Database of Disaster Responses, which covers every reported monetary and in-kind donation to relief and recovery from firms, governments, multinational agencies, and non-governmental organizations reported in news media for all disasters that affected the world from 1990 to 2018. Analyses of donations from 2,000 MNEs from 63 countries in the aftermath of high-consequence epidemics, natural disasters, and terrorist attacks affecting 175 countries indicate that the economic importance of the country to the MNE substantially explains donation amounts. The degree of market concentration, public aid, and the country's regulatory quality moderate this effect. The findings are robust to a vector of firm-, country-, and event-specific variables and alternative motives such as reputation, employee satisfaction, media salience, altruism, and poverty avoidance. Overall, the study offers evidence that company philanthropy under institutional disruptions deviates from predicted behavior under stable institutional contexts. Particularly, the findings contest the expectation that philanthropy grows in market competition. We find that monopolistic firms give the largest donations and may act as a stop-loss mechanism during large country catastrophes.

Keywords: **institutional economics, institutional disruptions, grand challenges, philanthropy, multinational enterprises**

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"There was no light, we had no water, no staff, the city disappeared, officials disappeared…There was absolutely no one."
Conception resident. Aftermath of the earthquake and tsunami in 2010 in Chile.

Introduction

There is growing interest in the field of organization science on the role of and factors shaping for-profit firm involvement in addressing grand societal challenges (Cabral et al. 2019, George et al. 2016, Luo and Kaul 2019). Social problems arise from features of the institutional context (Luo and Kaul 2019, Vakili and McGahan 2016) and existing research on grand challenges predominantly focuses on actors addressing chronic societal problems under stable institutional contexts such as poverty reduction (Mair and Marti 2009) and healthcare (Vakili and McGahan 2016). Yet, an increasingly important grand challenge stems from *institutional disruptions*—the severe and systemic, yet sudden and unpredictable breakdown of economic institutions. Behind the disruptions are phenomena such as epidemics, natural disasters, and terrorist attacks that halt firms' ability to obtain inputs or reach consumers due to the destruction of communication and transportation infrastructure (Boehm et al. 2019, Cavallo et al. 2014), shut down operations due to disruption of utilities and/or the absence of labor force due to employees and their families' lost housing, schooling, or health status (Altay and Ramirez 2010), and preclude major investments due to rises in market volatility (Oetzel and Oh 2014, Oh and Oetzel 2011).

For example, the coronavirus outbreak in early 2020 has led to full production interruptions for Nissan, Honda, General Motors, and other carmakers with plants in the affected Chinese city of Wuhan. Not only have their employees been unable to work, but consumers have delayed purchases and part suppliers have shutdown delivery. The disruption has impacted firms with affiliates in China, such as banks, hotels, luxury goods and technology companies. Many MNEs have responded with donations noting that the virus threatens their employees, suppliers, and the country's economy, with those most concerned having "ties to Wuhan, a big manufacturing hub" (Financial Times 2020a). Similar disruptions drive performance volatility and survival for firms economically connected to the affected country (Aghion et al. 2017). At

the country level, they explain labor, investment, and economic development (Baker and Bloom 2013, Barro 2007, Bloom, Floetotto, et al. 2018).

Firms are increasingly taking action to address acute grand challenges. In the last two decades, multinational enterprises (MNEs) have become the fastest growing sector worldwide in funding recovery from institutional disruptions, outpacing governments, multilateral agencies and individual charity (High-Level Panel on Humanitarian Financing 2016). Their action has important economic consequences: research on the effects of MNE philanthropy on economic recovery connects it to an average increase in relief speed of up to 260 percent and rebound of the Human Development Index of almost 200 percent (Ballesteros et al. 2017).

Scholars typically explain firm philanthropy with motives that have been widely-demonstrated under stable institutional contexts (Dorobantu et al. 2017, Luo and Kaul 2019). That is, firms donate with the hopes of accumulating reputational capital (Muller and Kräussl 2011), hedging the firm against political risk (Hornstein and Zhao 2018), responding to social norms (Marquis and Qian 2013, Zhang and Luo 2013), or satisfying social preferences such as altruism and reciprocity (Morgan and Tumlinson 2019). While this work has brought tremendous progress in understanding firm philanthropy, it overlooks that firm giving under institutional disruptions may follow a different motive: the restoration of economic institutions.

We study this motive by building on the literatures on the role of economic institutions for market operations (see Aguilera and Grøgaard 2019, Coase 1998, Ofori-Dankwa and Julian 2013 for surveys and seminal arguments) and for organizational responses to grand challenges (see Cabral et al. 2019, Dorobantu et al. 2017, George et al. 2016, Liang and Renneboog 2017, Luo and Kaul 2019).[i] We theorize that institutional disruptions reveal the strategic value of a country's economic institutions for firms and therefore will motivate MNEs to allocate resources toward relief and recovery in countries that explain their performance. For instance, tech companies with substantial operations in China, such as Apple, donated millions of dollars in medical resources in the initial stages of the coronavirus outbreak to protect their workforces. The larger the economic importance of a country for the MNE (i.e., the extent to which

the firm sells, buys, or rents inputs, final products or services, or hires human capital in the country market), the greater its incentives to restore economic institutions. In developing our theory, we take insights from our interviews with chief financial officers, risk managers, and other employees from over 100 Standards & Poor's 500 firms on their firms' actions before, during, and after institutional disruptions and use caselets, quotes, and anecdotes to illustrate how firms respond in the face of institutional disruptions.

Three key contextual factors moderate the effect of the economic importance of the country for the firm. First, the strategic value of local operations in the affected country, and therefore its incentives to donate, rises in the MNE share of the country market (Gubbi et al. 2015). Consequently, we expect MNE donations will increase with the concentration of the affected country market. Second, scarce public provision and maintenance of institutions increases firm incentives to respond because the opportunity cost of not funding recovery is high (Acemoglu and Robinson 2008). We thus hypothesize that donations from MNEs with high economic importance will decrease in the expected outpouring of public aid. Finally, the effectiveness of donations to restore economic institutions increases with the country's regulatory quality (Ballesteros and Gatignon 2019, Liang and Renneboog 2017, Luo and Kaul 2019). Therefore, donations from MNEs with high economic importance will increase with the regulatory quality of the country.

To empirically test this argumentation, we constructed the Global Database of Disaster Responses. The database covers every reported monetary and in-kind donation from firms, governments, multinational agencies, and non-governmental organizations reported in news media to the relief and recovery fund of all disasters that affected the world from 1990 to 2018. We merged this database with a database on shocks that meet the characteristics of institutional disruptions. Specifically, we consider epidemics, natural disasters, and terrorist attacks as shocks that have severe and systemic impacts (Baker and Bloom 2013, Bloom, Floetotto, et al. 2018, Kozeniauskas et al. 2018) and identify sudden shocks whose damages ranked at the 99th percentile over the last 30 years in the countries that they affected. We analyze all reported donations between 2007 and 2018 from the 2,000 largest global publicly listed MNEs.

The results indicate that the degree of economic importance of the affected country strongly predicts philanthropic giving in the aftermath of disruptions. Market concentration and regulatory quality positively moderate while foreign and domestic public aid negatively moderates this result. Consistent with the motive of restoring economic institutions, we observe that donations are skewed to disasters with comparatively high economic damage. Additional analyses suggest that the economic importance of the country to the firm mediates reputational capital. Hence, reputation does not explain the statistical power of economic importance. The results are robust to alternative explanations, such as pressure by the local government, the pursuit of market growth, media visibility, inequity and poverty aversion, the altruistic motivations of employees, a set of firm, country, and event controls, and matched-sample analysis.

This study contributes to the literature on nonmarket strategy. First, it provides evidence that the motivation for philanthropy of MNEs in the aftermath of institutional disruptions is functionally different to that spurred by enduring forces under stable conditions, such as stakeholder pressures (Cuypers et al. 2015) and industry norms (Marquis and Tilcsik 2016). The analyses suggest that, in the aftermath of acute crises, a country's economic importance to the MNE determines when and the magnitude by which specific strategic considerations will be activated. For instance, the mediation analysis suggests that the strategic value of accruing reputational capital via donations is contingent on the economic footprint of the firm in the country. Likewise, recurrent relationships with target beneficiaries are likely to active reciprocal, altruistic, and other social preferences. Therefore, our findings shed light on the generalizability of the antecedents of company philanthropy, particularly for MNEs in the aftermath of acute crises.

Second, this study distinguishes the concept of institutional disruptions and its relevance to nonmarket behavior. The notion of institutional disruptions as characterized by the unexpected and sudden, short-lived but severe and pervasive breakdown in institutions has yet to be fully developed. Institutional disruptions impact emerging and developed economies alike and are distinct from the long-lasting or permanent absence of market-based institutions that scholars traditionally limit to emerging market countries (Dutt et al. 2016, Jiang and Peng 2011, Khanna and Palepu 1997). Much of the emphasis in extant work on for-

profit firms addressing grand challenges has been on chronic issues in stable institutional contexts (Cabral et al. 2019, Dorobantu et al. 2017) rather than acute issues arising from disrupted institutional contexts. Our results suggest that this theoretical distinction is meaningful. For instance, the overlap between private and public interests in concentrated markets seems to be substantially greater during institutional disruptions. Monopolistic firms act as a stop-loss mechanism when grand challenges overwhelm the capacity of governments. We observe this stylized fact across levels of country income and institutional development.

Finally, this paper contributes to scholarship studying how grand challenges affect firm strategy and structure. Prior work focuses on organizational choices seeking to mitigate or prevent exposure to country risks or uncertainty shocks through, for example, avoiding disaster-prone countries (Oetzel and Oh 2014) or eliminating problematic affiliates (Rerup 2009). Scholars have studied how shocks may deter firm survival (Ballesteros and Kunreuther 2018), affect organizational change (Christianson et al. 2009), and learning (Lampel et al. 2009). Our study identifies firm characteristics and country market conditions under which large MNEs become key actors in helping societies overcome grand challenges around the world.

Theory and Hypotheses

Institutional Disruptions and Firm Performance

A country's business activity is a function of the availability of economic institutions or the intangible and physical goods necessary for market operations such as transportation and communication systems, product, capital, and labor markets, and regulatory and enforcement systems (Acemoglu et al. 2005, Coase 1988, Dutt et al. 2016, Khanna and Palepu 1997, Williamson 2000).[ii] Institutions drive the smooth functioning of markets (Coase 1988). Economic institutions affect firm costs of exchange and production (Bloom, Sadun, et al. 2018) and firm ability to transact or operate (Dutt et al. 2016, Mair and Marti 2009). Underpinning the functioning of the physical and intangible goods necessary for business activity is the

presence of material and human factors that allow market transactions to occur; when they disappear, become damaged, or destroyed, there is a breakdown in economic institutions.

Traditionally, the literature situates organizational nonmarket behavior as a response to enduring societal issues and under relatively stable institutional contexts (Dorobantu et al. 2017, Luo and Kaul 2019). The breakdown, absence, or failure of economic institutions creates frictions that increase both societal and firm costs, which in turn motivates firms to engage in non-market strategies to resolve such institutional frictions (Coase 1960, Dorobantu et al. 2017, Luo and Kaul 2019).

Broadly, scholars have classified countries as lacking economic institutions (Doh et al. 2017, Khanna and Palepu 1997, Luo and Chung 2013) and/or experiencing evolutionary processes that result in different institutions (Klüppel et al. 2018, Marquis et al. 2016, Newman 2000, Peng 2003).[iii] The literature is less explicit about institutional disruptions. We argue that these contexts are different in four cardinal ways:

Suddenness and Unexpectedness. In the face of institutional voids or evolutionary changes, checks and balances and due processes using macro variables facilitate assessing challenges associated with the lack of or underdeveloped economic institutions (Henisz 2016). This enables decision makers to assess country attractiveness (Baker et al. 2016, Berry et al. 2010) and adjust their organizations' structures (Chittoor et al. 2015) and strategies (Hiatt and Sine 2014) to the evolving institutional context (Flores and Aguilera 2007, Wu and Chang 2014).

Conversely, disruptions are highly unpredictable and rapid drops in the functioning or availability of goods necessary for market operation. Firms have little time to prepare and adjust their operations. Pre-emptive planning to avoid the effects of disruptions is difficult. For instance, over 75 percent of the firms we interviewed noted the existence of routines for threat identification and prioritization against disruptions. However, they also commented that the relevant information required for their planning are mostly unavailable. In fact, measures of country risk and institutional development are often poor indicators of the resilience of economic institutions against disruptions (Ballesteros and Kunreuther 2018). To

illustrate, prior to the Tōhoku disaster that resulted in the largest economic damage associated with one event in history, scientists calculated a zero probability that a hundred-foot wave tsunami could hit Japan (Ferris and Solis 2013) and many firms believed that the third largest economy worldwide barely would be affected (Kunreuther and Useem 2018). As the CEO of a chemical company explained: "…*We got together all of our leaders and we had them work through three different scenarios using data from the government on what they would do…we had those plans in place… (The loss) turned out to be a lot worse*."

High Severity. While evolutionary changes result in neutral or positive alterations to market (Chittoor et al. 2009), institutional disruptions have unambiguously destructive effects. Barro (2009) finds that the welfare costs associated with sudden and high-magnitude shocks are about 20 percent of the affected country's GDP, compared to 1.5 percent for incremental institutional changes. In the U.S., the Federal Emergency Management Agency calculates that 40 percent of businesses do not reopen after being hit by a natural disaster and 90 percent go bankrupt within a year if they do not resume operations in a week (FEMA 2015).

This degree of magnitude in the consequences of disruptions was ubiquitous in our interviews. In the context of the Japanese earthquake and tsunami in 2011, a manager of a logistics company stated that *"(The firm is) worried about roads, trains, airports. Things that get produced going to be delayed an also the materials to produce them. Everyone is going to miss their numbers.*" Additionally, there is a pervasive loss in connectivity with stakeholders (Alfaro and Chen 2012) and, more broadly, provision of products and services (Bloom, Floetotto, et al. 2018). The earthquakes and tsunamis in Chile in 2010 and Japan in 2011, for instance, destroyed respectively 32 percent and 17 percent of goods supply for at least two months (Cavallo et al. 2014).

Short-lived Temporality. While evolutionary changes lead to persistent alterations in economic institutions and voids represent the status quo characterized by the persistent absence of goods for market operation (Fabrizio 2012, Hoskisson et al. 2000, Khanna and Palepu 1997), disruptions are temporary deviations from the institutional status quo. The sudden inability to operate during disruptions comes from

the fact that the phenomena behind them fully develop in a matter of days (Guha-Sapir et al. 2004). For instance, even though Hurricane Harvey formed and dissipated in less than two weeks, the malfunctioning of the communication infrastructure and the shock to the labor market from displaced and affected workers halted output in the shipping, energy, chemical, refinery and other industries for months and led to 1-in-1000-years economic destruction in the U.S. (Ballesteros and Kunreuther 2018).

Although some phenomena behind disruptions, such as earthquakes, may lead to adjustments in norms like building codes, most economic institutions return to a similar level (Cavallo et al. 2014, Useem et al. 2015). The length of this process varies across institutions. Scarcity, absence, or malfunction are overcome within months for essential goods such as education and housing (Tomasini and Van Wassenhove 2009). For others, such as transportation systems, recovery may take several years (Ballesteros and Kunreuther 2018). For instance, two years after Hurricane Katrina in the U.S. only 66 percent of the mail service in the areas affected had been restored (Paxson and Rouse 2008) and the malfunctioning of labor markets lasted for at least three years (McIntosh 2008).

Pervasiveness. Scholars traditionally situate institutional voids in lower-income countries or emerging economies (Doh et al. 2017, Khanna and Palepu 1997) and evolutionary changes in transitional political systems (Banalieva et al. 2015, Peng 2003, Toulan 2002). Conversely, institutional disruptions spread across levels of institutional and economic development, with costlier shocks affecting medium- and high-income countries (High-Level Panel on Humanitarian Financing 2016). MNEs increasingly acknowledge this ubiquity with our interviews indicating that most of these firms discuss the role of disruptions at each board meeting. The head of operational risks of the bank indicated that "*Before the terrorist attacks* (of 9/11 in the U.S.) *there was a sense that things happen in places like Nigeria, but they don't happen in places like New York City*."

The effects of institutional disruptions are systemic at the country level. Even when affiliates are not directly hit, economic interdependencies transmit shocks across industries and regions. In response to the coronavirus in 2020, production facilities outside the outbreak area were closed across China. Companies

like Apple expected an important financial hit given that closed plants account for 15 percent of cellphone supplies worldwide (Financial Times 2020b). The effect on financial intermediaries is similarly problematic. Take the case of the Tōhoku earthquake in Japan when 11.4 percent of firms operating in the country indicated that their bank could not operate (Miyakawa and Hosono 2014). As a result, otherwise undamaged firms whose banks were affected observed significantly smaller investment following the disruption (Hosono et al. 2016).

These four characteristics are key to understand when and how philanthropy after disruptions occurs. Their high-consequence dimension incentivizes decision makers to allocate resources to mitigate the impact on firm performance and market position. Additionally, their multi-faceted and pervasive nature means that firms often need to consider strategic actions that that go beyond their own operations. On the other hand, the abruptness and ambiguity of institutional disruptions often yield prevention and coping mechanisms unfeasible or ineffective and the temporal nature of the deviations from the status quo attenuates incentives to undertake drastic changes in the value chain and firm structure. Consequently, non-market response, in particular donating, is a recurrent behavior against this type of grand challenge.

The Strategic Value of Countries and the Philanthropy of MNEs After Disruptions

Donations by MNEs can be an effective non-market strategy for recovering economic institutions. Research evaluating the economic value of company philanthropy indicates that the speed of a country's economic recovery is directly proportional to the share of aid from MNEs (Ballesteros et al. 2017, Ballesteros and Gatignon 2019). This type of philanthropy has exploded since the turn of the 21st century and cash and in-kind donations from firms explain the largest proportional increase in aid in the last two decades (High-Level Panel on Humanitarian Financing 2016). For some disruptions, total company donations were greater than the combined contribution by foreign governments, multilateral agencies, and private charities.

At the same time, donating toward institutional disruption recovery implies a degree of organizational complexity and an opportunity cost that is abnormal to donating toward chronic conditions. Given the uncertainty of institutional disruptions, this type of philanthropy is rarely budgeted and the firm must often defer market investments or cancel previously planned social projects (Ballesteros et al. 2018). In fact, corporations regularly re-allocate resources from previously approved causes that account for their annual social responsibility budget or even more. Take the case of the pharmaceutical company Pfizer, which donated $47 million in the aftermath of the Indian Ocean tsunami in 2004, or many times the combined annual social expenditure in the eight affected countries. Likewise, the technology company Cisco gave $50 million toward the recovery of the Chinese market from the 2008 earthquake, which was three times its annual social budget in China (Kunreuther and Useem 2018). In addition to this opportunity cost, the constrained availability of local resources and damage to the philanthropy network can motivate firms to engage in scarce giving and freeride on others' actions.

Given these opposing forces, a central question for addressing these sudden and acute grand challenges is what factors affect when an MNE will become a contributor towards recovery. We argue that a decisive determinant of the cost and benefits of acting is the economic importance of the country to the firm. On the one hand, the opportunity cost of not donating is comparatively high for MNEs whose performance is a function of the affected country's institutions. These organizations are more likely to suffer financial losses than a similar one with no such economic linkage (Aghion et al. 2017, Alfaro and Chen 2012). More broadly, MNEs economically tied to the affected country experience reductions in sales due to loss of consumer purchasing power, in productivity because their employees or their families were injured, in their ability to provide services because their offices suffered structural damage, and in their production scales because the disruption shut down their suppliers and make shortages of public services ubiquitous (Kunreuther and Useem 2018). Therefore, the consequences of institutional disruptions on firm performance becomes a driver of the organizational decision to allocate resources into philanthropy.

Affiliates of strategic importance are likely to receive support from top management in response to institutional changes because the performance impact is material to the firm (Gubbi et al. 2015). Firms are motivated to provide fiscal resources to minimize the spillover effects across affiliates (Gopalan et al. 2007) and are more likely to take actions where the impact of existing institutions on the firm's business is greater (Hadani and Schuler 2013, Hillman et al. 2004). Our interviewees frequently refer to this idea, as a manager of a manufacture firm commented: "*The situation in Thailand was very different from Japan following the earthquake in an important way. When the impact (hit) a size of our business that was much greater, we immediately mobilized resources…We knew that if it escalated, it will be bad for us because a larger supply chain disruption… in this case a component sourcing from Thailand."*

On the other hand, recent studies suggest that the marginal productivity of donations toward disruptions increases in the economic importance of the affected country for the firm (George et al. 2016, Kaul and Luo 2017, Luo and Kaul 2019). MNEs with large local operations are more efficient at identifying areas instrumental for market functioning, provide capital faster than traditional sources of emergency aid, and in assisting rebuilding efforts towards recovery (Ballesteros et al. 2017, Kunreuther and Useem 2018). The vice president of corporate affiliations of a large mining company stated in the context of the Chilean earthquake in 2010:*"Chile is number one copper producer and that represents a big part of our business…our supply chain was affected, so we mobilized…"* The company used their technology and machinery towards institutional recovery commenting on their target: *"the first action, to clean the roads… and allow communication and transportation systems to be restored."* This is exemplary of an overlap between core operations and non-market behavior that results in reductions in the cost of philanthropy (Luo and Kaul 2019).

Taken together, the philanthropy of MNEs toward disruptions in economically important countries has immediate and certain financial payoffs in comparison with other motives behind philanthropy such as reputational capital, future stakeholder reciprocity or altruism, or a societal punishment. Restoring economic institutions enable the firm to operate and reduce uncertainty for its transactions. These outcomes

are proportional to the economic importance of the country to the MNE. Thus, we summarize our baseline hypothesis as follows:

Hypothesis 1 (H1): The greater the economic importance of a country for the firm, the greater its donation in response to an institutional disruption.

According to the literature on the institutional economics and firm non-market strategy, there are three contextual factors that moderate this baseline relationship.

Market Concentration. Country market concentration directly influences the perceived costs and benefits of donating in response to institutional disruptions. MNEs provide greater support to an affiliate and are more likely to respond to institutional changes when the affiliate is a dominant player in its market (Gubbi et al. 2015). As high, frequent users of the economic institutions in the country, the consequences of institutional disruption are more severe for organizations that account for a large share of the country market.

Disruptions shake market competition and shuffle leadership (Alfaro and Chen 2012). New production technologies are introduced, products or services enter the market, and new firms expand after the disruption (Ballesteros and Kunreuther 2018). Consequently, speeding the pace of economic recovery can help stave off erosion of market position. A chief financial officer from an auto company summed up this concern in the context of the 2011 disaster in Japan: "*(The disruption) took our capacity offline for months. And that had a significant impact on our earnings and ability to supply parts...it has taken us 18 to 24 months to regain the share that we lost*." Similarly, interviewed managers from a large mining company reflected on the fact that the company's operations in Chile accounted for approximately three percent of the country's GDP to emphasize the marginal relevance of facing operative interruptions. The firm donated 30 million on rebuilding.

Firms that represent a large share of the market capture a greater proportion of the benefits from the engagement in societal issues (Luo and Kaul 2019). Holding everything else constant, the smaller the

number of MNEs holding a share of the country market, the greater the per-firm benefit of donating in the aftermath of disruptions. A corner solution is that the donations of firms that are monopolists are private investments. These firms can capture the benefits from the capital injected to restore labor markets, product markets, and infrastructure within their industry and the benefits from the recovery of its suppliers and customers in other industries. In contrast, in fragmented markets, the benefits are distributed across more firms and this dilutes the perceive value of nonmarket action (Kaul and Luo 2017). That is, holding everything else constant, we expect that:

Hypothesis 2 (H2): The effect of the economic importance of a country for the MNE on its donation in the aftermath of institutional disruptions increases in the affected country's market concentration.

Public Aid. Public actors have traditionally played an essential role in the management of grand challenges (Cabral et al. 2019, George et al. 2016). In the case of institutional disruptions, public aid comes from the national government and foreign governments and multilateral agencies, such as the OECD's Official Development Assistance and the United Nations' Office for the Coordination of Humanitarian Affairs (High-Level Panel on Humanitarian Financing 2016).[iv] For decision makers from MNEs with economically important connections with the affected country market, a recent history of substantial public aid to supply and maintain the goods necessary for market operation fosters the systematic expectation that public aid will fund the country's recovery from institutional disruptions. This should be a key moderating factor affecting the organization's incentives to donate.

There is evidence at the individual level of the crowding-out effect of public intervention on philanthropy (Andreoni 2006). We hypothesize that a similar relationship operates at the organizational level. That is, MNEs donate less to countries that are economically important if they expect public aid to recover the economic institutions. Conversely, under contexts where domestic and foreign agencies do not mobilize resources in sufficient magnitude, companies are more likely to deem firm resources critical for recovery. This argument is captured by vice president in a soft-drink manufacturer when explaining his

company's philanthropic engagement after the 2011 disaster in Japan: *"We are part of a system. If the [Japanese] government cannot [effect a recovery], we need to rebuild. We need the market to recover."* Economically connected MNEs will thus donate more after a disruption when they believe that the economic magnitude outstrips public resources for relief and recovery.

Hypothesis 3 (H3): The effect of the economic importance of a country for the MNE on its donation in the aftermath of institutional disruptions decreases in public aid.

Regulatory Quality. The state of governance in the affected country influences the materialization of incentives for non-market behaviour (Aguilera et al. 2007, Dorobantu et al. 2017, Ferrell et al. 2016, Zhang et al. 2016). Government commitment and/or ability to formulate and implement policies to permit and promote private sector development, referred to as regulatory quality (Kaufmann et al. 2011), is critical for the creation and maintenance of economic institutions. High regulatory quality enables the swift use and dedicated allocation of resources towards economic institutions, and therefore affects the comparative efficiency of firm giving towards the recovery of economic institutions.

When regulatory quality is low, the process of rebuilding infrastructure can be substantially impeded by lower government commitment, ability, or red tape (Becerra et al. 2014). Moreover, donations are more likely to be diverted or suffer leakages before reaching the target areas (Luo 2006). For instance, reports suggest that the misuse of aid by the local government may be behind the slow recovery of Haiti from the 2010 earthquake (Useem et al. 2015). Local officials demanded cuts of donations to clear customs and held up goods at borders to force payment (Farny et al. 2019). Likewise, a lengthy process of experimentation by the Japanese government hampered the restoration of key institutions such as communication systems and the labor market after the 2011 disaster (Lipscy and Takinami 2013). Some of our interviewees noted a similar case after the Chilean earthquake in 2010 when companies were encouraged to contribute to recovery directly through the government's ministries. Firms soon realized that government inefficiencies

mired the delivery of funds. As noted by one manager, *"we were worried that the public system would take forever to apply resources to the emergency…and that, for sure, led firms to think twice about donating."*

Therefore, holding everything else constant, low regulatory quality deters donations from firms with high economic importance because business decision makers fear resources will be delayed or not be well spent, which increases the relative costs of giving. In such environments, skepticism abounds as to whether the benefits of donations will materialize as one survivor of the Haiti earthquake commented, *"there might be some more money (from the donors), but those who need it won't receive it"* (Farny et al. 2019). Therefore:

Hypothesis 4 (H4). The effect of the economic importance of a country for the MNE on its donation in the aftermath of institutional disruptions increases in the affected country's regulatory quality.

Empirical Strategy

Data

Donations. We coordinated a collaborative project with researchers from the business school and the computer and information science department of a university in the United States to build the Global Database of Disaster Responses on every reported cash and in-kind donation from organizations (firms, governments, multinational agencies, and non-governmental actors) to relief and recovery from every major disaster that affected the world from 1990-2018. The cornerstone of this five-year data collection and coding was automated Boolean searches and natural language processing in Python.

Our search covered newspapers, trade press, magazines, newswires, press releases, TV and radio transcripts, digital video and audio clips, corporate websites and reports, institutional websites and reports, and government websites and reports, among other sources, and was run in Factiva, Google, and Lexis Nexis. The Boolean combinations included the name of the affected country (e.g., Japan), in some cases the name of the disaster (e.g., Tohoku), the type of the disaster (e.g., tsunami), and derivations of the action

(e.g., donating~). The search period was a window of one year from the start date of the disruption. Less than 0.001 percent of the company donations were made after such window.

These searches resulted in over 2,310,000 reports. To make these reports computationally tractable, we applied differential language analysis to code information on the donor organization, the characteristics of the donation (i.e., in-kind, monetary or both, amount, currency, and timing), and the initiator within the firm (i.e., employees or top management).

We recorded a continuous variable for the total dollar amount of the *donation*, logged for analyses.[v] For in-kind contributions (e.g., 5000 bottles of drinking water), we monetized the total value of the goods using the monetary value reported by the donor, when available; if not, we used the value of similar donations reported by other donors. Where neither of these two sources was available, we calculated the value of the donation using current prices (e.g., the average price of one litter of bottled water) in the affected nation. We also converted values into U.S. dollars when necessary using the exchange rate on the donation date according to http://www.xe.com/. The complete database covers 96,858 donations from 40,170 firms from 84 countries of origin.

We hired independent researchers to conduct two different procedures to verify the quality of the dataset using third-party sources such as company sustainability reports. We randomly selected five percent of the events (156) for the period 2003-2013 and researchers searched reports using Google, Lexis Nexis, and Factiva. From this procedure, 5.1 percent of the selected events (eight) had data inaccuracies. About 60 percent of these errors were associated with monetizing the in-kind value of donations, with less than 8% of the donations were incorrectly marked. The rest of sample of discrepancies were due to missing data on the nature of donor's business.

We also compared our data with third-party sources. We had access to exclusive information of donation for the 2010 tsunami and earthquake in Chile via the Chilean government. By comparing our database with the list of donors given by the Chilean government, we found that our dataset comprised 68

percent of the official source. Our tracking did not include donations of small- and medium-sized Chilean, non-multinational enterprises. In terms of magnitude, our dataset accounted for 92 percent of the total corporate aid for the event.[vi] Second, we collaborated with staff members of the United Nations Office for Coordination of Humanitarian Affairs (UNOCHA) to compare our database with the Financial Tracking System (FTS). This is a global database that records self-reported international humanitarian aid for different humanitarian crises. The FTS covered about seven percent of our firm donations and 65 percent of our government and NGO donations. Finally, we compared our database with data from the U.S. Chamber of Commerce Foundation maintains Disaster Corporate Aid Trackers that are self-reported records for company response to disasters that focus on U.S. firms. Their data start in 2010 for selected disasters, particularly in the U.S., and account for 11 percent of our database.

These procedures to collect and code data and evaluate accuracy are detailed in the online Appendix at https://institutionaldisruptions.org.

Institutional Disruptions. To ensure internal validity of the analyses with the concept of institutional disruption, we focus on sudden and unpredictable shocks that created severe and systemic losses in the country market. First, we follow Baker and Bloom (2013) who show that large terrorist attacks and natural catastrophes are associated with abnormal levels of market volatility and significantly explain GDP growth. Second, we build on Ballesteros and Gatignon (2019) to capture suddenness and unpredictability and select shocks whose end date is within 30 days of the start date. Close to 90 percent of firm responses to these shocks come within eight weeks of the start date when environmental uncertainty and causal ambiguity are high (Ballesteros and Kunreuther 2018, Bloom 2009). Third, to meet a stringent characterization of severity, we calculate the percentile distribution of deaths, affected people, and economic damage by country for all disasters reported between 1997 and 2018 in the International Disaster Database (EM-DAT), which uses a minimum degree of impacts to record events.[vii] We use percentiles because the mean and standard deviations are inefficient location statistics given the skewness of the historic distribution of consequences. Following previous work that classify disasters based on their impacts, we focus on severity

values at the 99th percentile (Cavallo et al. 2013). We collected and confirmed shock data from a combination of sources.[viii] The United Nations Office for Coordination of Humanitarian Affairs (UNOCHA) and the reinsurance company Swiss Re provided us with data on damage. Results of the independent checks of data accuracy are in the Appendix.

Our firm-level data covers the period 2007-2018 that had 4,273 shocks worldwide meeting the criteria for inclusion in the EM-DAT database and 3,701 classify as sudden shocks. To apply fixed-effects models, we drop 15 single-disaster countries that we incorporate in robustness tests. At the 99th percentile of severity, there are 234 shocks. These institutional disruptions represent the four levels of country income according to the World Bank.[ix] In robustness tests, we use the 75th and 90th severity percentiles. The online Appendix has the complete identification procedure for institutional disruptions, the severity cutoffs by country, and distributional graphs and tables.

Economic Importance. To operationalize a country's economic importance to a focal MNE, we focus on the proportion of affiliates by the MNE in the affected country. The international literature has consistently identified the geographical dispersion of affiliates as a determinant of corporate performance (see for example Alfaro et al. 2018, Andersson et al. 2002, Berry 2014, Bloom, Sadun, et al. 2018, Flores and Aguilera 2007, Knott and Turner 2019). We adjust the calculation by the MNE's ownership percentage of each affiliate because the strategic value of country-specific performance for the firm and its incentives to restore economic institutions rises in ownership.

The economic importance, *k*, of country *m* to firm *i* at year *t*, ranges from 0 (low) to 1 (high) and has the following form:

$$k_{mt}^{i} = f(\sigma_{m}^{i})_{t} \tag{1}$$

where

$\sigma_{m}^{i} = \frac{\sum_{0}^{n}(affiliate\ in\ country\ m * \%\ ownership\ )}{(total\ number\ of\ MNE\ affiliates\ worlwide)})$; $n\ is\ number\ of\ affiliates\ in\ country\ m$ at year t.

In robustness models we use alternative measures of the explanatory variable: i) We tested the possibility that the headquarters dominate the effects (Knott and Turner 2019) by excluding donations to countries where the MNE has at least one headquarters (see table 10 of the Appendix at https://www.institutionaldisruptions.org/); ii) We included the number of employees and revenue by country (However, we consider that these variables may skew the results towards certain types of firms and operations. For example, revenue may strongly represent sales and underrepresent production subsidiaries.); iii) We ran models with disaggregated measures of number of employees and revenue; and, iv) we did not adjust for ownership.

Of note, *economic importance* offers a conservative estimation of the strategic value of the country market in two ways. First, MNEs with no ongoing operations that plan to expand to the country soon may have a comparatively high incentive to donate. Likewise, firms that plan to exit the country soon may have a reduced incentive to donate. Given that we calculate this variable on the year of the disruption, the donation behavior of firms with these two strategies should reduce the statistical significance of our predictor. Second, this variable does not include sporadic commercial activity. Consequently, it is likely that the number of organizational donors with some economic connection with the stricken country is higher than that reflected in the analyses.

Firm-level data. The affiliate-level database comes from Orbis and Lexis Nexus Directory of Corporate Affiliates databases, which contain rich affiliate-level data on MNEs at the international level.[x] Our sample is composed of the 2,000 largest publicly traded firms at the international level by total revenue in 2019 and covered over 205,267 affiliates in the period 2007-2018. We used shareholder ownership data from the Orbis Ownership database to track changes in the ownership of affiliates over time due to mergers and acquisitions and spinoffs. Where information was missing from the database and where conflicting information was provided in the database, we cross-checked the data with public filings and information from corporate websites.

Regarding missing data, we analyzed patterns of missingness and found no systematic divergence on the completely observed variables between those with missing data and those with available data. In other words, the hypothesis that data are missing completely at random cannot be rejected. Given the discussed idiosyncrasies of company donations and these studied events, addressing missingness with traditional strategies like listwise deletion or mean substitution would have fostered the risk of obtaining biased estimates, increasing Type II errors, and underestimating correlations and coefficient weights.

Therefore, we used a multiple-input bootstrapping algorithm as explained by Honaker and King (2010). This form of multiple imputation accounts for smooth time trends, changes across cross-sectional variables, and time and space correlations and integrates scant knowledge to specific cells when available. A review of how this method can produce more accurate imputation particularly for data used in the social sciences than traditional procedures can be found in Blackwell et al (2017). To account for nonlinear effects in the case of disasters, we used binary indicators for deaths, total affected, and estimated damage in the percentile regions 0th-25th, 25th-50th, 50th-75th, or 75th-95th , with observations above the 95th percentile as the omitted category.

This method also enables us to use an alternative measure of economic importance for robustness tests: an estimated a Chebyshev polynomial expansion in affiliates, revenue, and employees by MNE in each country. The justification for this measure is that a high-order polynomial may approximate most functional forms (Kolsarici and Vakratsas 2015). We opted for a third-order polynomial based on the Bayesian information criterion after considering expansions up to the 20th degree. See the Appendix for procedures treating missing data and the formal model for the polynomial.

Moderators.

For H2, we calculated a Herfindahl–Hirschman Index (HHI) (Rhoades 1993). *Market concentration* is the sum of squares of the market share of the largest five firms in the focal country in the year before the institutional disruption. This variable provides a normalized value of the number of large firms that can

supply significant amounts of philanthropy in the face of grand challenges (George et al. 2016, Kaul and Luo 2017). Large values indicate a concentrated country market.

For H3, we consider the institutional differences between the allocation of domestic and foreign public aid (Agénor and Aizenman 2010, Becerra et al. 2015, Stromberg 2007) and thus calculate separate measures with individual betas. Moreover, to avoid reverse causality and maximize the focus on the information that organizations have at the time of making the donation decision (Becerra et al. 2014), we use the average value of aid in the years before the disaster. According to the literature on aid and disaster management, the average net official development assistance and official aid and the country's average gross national expenditure explain the availability of foreign and local resources towards disruptions, respectively (Becerra et al. 2014, Cavallo et al. 2013). We collected each of these measures from the World Bank World Development Indicators (WDI) database.[xi] *Foreign public aid* is the logged value of the average of net official development assistance and official aid received in current US dollars in the two years preceding the disaster. *Local public aid* is operationalized as the logged average value of gross national expenditure in current US dollars in the two years preceding the disaster.

For H4, we used *regulatory quality*, a scale indicator from the World Bank Worldwide Governance Indicators (WGI).[xii] This variable "captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development" (Kaufmann et al. 2011, p. 4). The estimate ranges from 0 (weak) to 100 (strong). We have included in the Appendix a a description of the survey items and sources for this variable.

Controls. Some models have month, year, firm, and country fixed-effects to control for unobserved time-invariant factors and path-dependent donation behavior. Estimation vectors contain time-variant factors that scholars have identified as potential determinants of firm philanthropy. At the firm level, return on assets (*ROA*) and *Tobins'q*, both winsorized at 5 percent, and logarithms of *total assets*, *total revenue*, *total employees* proxy for performance and size, which may affect the firm's capacity to donate and the existence of disruption-specific resources (Ballesteros and Gatignon 2019, Ferrell et al. 2016, Flammer et

al. 2019, Liang and Renneboog 2017, Patten 2008). Research and development intensity (*R&D*) and *advertising and administration* expenditures (logged) may determine intangible resources, such as reputation and visibility, that are behind the capacity to accrue rents from philanthropy (Servaes and Tamayo 2013).[xiii] To address the issue of *donor fatigue*, we include the number of MNE donations made within the previous year. *Customer orientation*, measured as a binary indicator set equal to one when the MNE's main activity is retail or services, may entail a different propensity to donate (Ballesteros et al. 2017) and *industry*, which we control for with four-digit SIC code fixed effects, may be associated with specific social norms, rules, and regulation underlying philanthropy (Marquis and Tilcsik 2016). We lagged all these variables by one year.

At the country level, we include logged values of the gross development product (*GDP*) PPP USD current international, *population*, percentage of *urban population*, and land *area* (km^2), because these factors may skew shock exposure, the functioning of economic institutions, and aid (Acemoglu et al. 2005, Ballesteros et al. 2017, Becerra et al. 2014, Cavallo et al. 2013). We account for the country's *control of corruption* capturing "perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests" (Kaufmann et al. 2011). The data come from the WDI and the WGI and are lagged one year.

At the event level, we include dummies for *disruption type*, and natural logarithms of the number of *deaths* and *affected* people (i.e., displaced and injured) and economic *damage* because global philanthropy may be biased to some events (Eisensee and Strömberg 2007).[xiv] To account for donor fatigue of other entities, we use the logged annual number of *disruptions in country* and *worldwide* in the year before the focal disruption (Ballesteros and Gatignon 2019). Finally, we control for other *newsworthy events* that may crowd out aid by using the average of the median number of minutes a news broadcast devotes to the top three news segments in a day over the 40 days after the disaster date (Stromberg 2007).

Interviews. Working with a research team based in a U.S. university, we conducted over 148 unstructured interviews with chief financial officers, risk managers, and other employees from 102 S&P

500 firms on their firms' strategies and actions dealing with severe adverse events and their consequences. The interviews occurred over the five-year period between 2012 and 2017 and covered a broad range of MNEs across industry sector and size, with annual revenues ranging from $1 billion to over $400 billion and employees ranging from a few thousand employees to over two million.

In approaching each MNE for interviews, we reported that the purpose of the study was to understand the role of directors, executives, and managers in dealing with large risks broadly defined, and that the study's results should be of practical interest to them. We assured those interviewed of confidentiality. A list of questions guided each interview (see the Appendix for details of the interview guide). The research team recorded and transcribed each interview. The transcripts of the interviews contained over 350,000 words in total. We used NVivo, a qualitative data analysis software package, to identify the major themes. We followed up with requests for elaboration and clarification from the company directors, executives, and managers on questions and topics that emerged during our initial interviews.

Method

We regressed the *US dollar amount* of giving using generalized least squares of the following form:

$$Donation_i = \alpha_1(economic\ importance) + \alpha_{2a}(economic\ importance * market\ concentration) + \alpha_{2b}(economic\ importance * national\ government\ aid) + \alpha_{2c}(economic\ importance * foreign\ government\ aid) + \alpha_{2d}(economic\ importance * regulatory\ quality) + \alpha'(\theta_i) + \varepsilon_i \quad (2)$$

where the vector θ_i contains firm-, country-, and event-specific variables, and, in some models, fixed-effects. We focused on models with random effects (bootstrapped errors) and applied (firm-by-country) fixed-effects for robustness checks (the p-value for the Hausman test is 0.1037). In the Results section, we detail additional robustness checks and a matching method and random forest model to further address potential endogeneity.

Results

Table 1 summarizes the different constructs and variables and Tables 2 and 3 show descriptive statistics and correlations, respectively.

[INSERT Tables 1, 2, and 3 ABOUT HERE]

Results tables report bootstrapped standard errors clustered by MNE in parentheses. Tables 4 and 5 report individual effects for every moderating variable, with random and fixed effects, respectively. Table 6 has the full models. The analyses suggest that the economic importance of the country is an important underlying factor behind MNE donations in the aftermath of institutional disruptions. By rising one unit the economic importance of a country for the MNE, we expect its donation to increase by 23.77 percent (23.46 with fixed effects) (Table 6, Model 11 and 12). These economically substantial findings are robust to the inclusion of the different firm-, country-, and event-, firm-specific, time-variant and time-invariant controls, and the moderating variables. As explained above, *economic importance* offers a conservative estimate of the strategic importance of the country economic institutions to the firm. Support of this argument comes from the fact that the Freedman-Lane semi-partialing method resulted in smaller standard errors than linear models. Taken together, these results offer evidence of the baseline hypothesis.

[INSERT Table 4 ABOUT HERE]

In line with H2, the analyses suggest that the level of market competition has an inverse effect on the willingness of business decision-makers to donate. When the bulk of the country's market was mostly explained by the operations of a few firms, as measured by the HHI, companies tended to donate more. Table 4, model 3 and table 5 model 8 present the individual moderating effect with random and fixed effects, respectively. The full models show that a one unit increase in the degree of concentration of the affected country is associated with an average increase in the donation of economically connected MNEs from 94 percent (fixed-effects model) to 97 percent (random-effects model).

The results indicate that public intervention moderates the incentives to donate for MNEs whose local operations are economically important. First, we observe a noncomplete crowding-out effect of local public

aid on company philanthropy. As hypothesized in H3, a one-percent increase of local aid is associated with a 5.5 percent smaller donation amount (5.4 for fixed effects), on average (Model 11 and 12 in table 6). On the other hand, a similar magnitude increase of foreign public aid has the opposite impact of a .03 percent larger donation amount. In addition to the full models, the individual models 4 (random effects) and 9 (fixed effects) provide similar evidence. This contradicts our original argument in H3 and demonstrates that theoretically considering the origin of public aid is empirically meaningful.

For Hypothesis 4, the analysis indicate that regulatory quality is associated with larger donations from MNEs responding to disruptions in countries that are economically important for their performance. The associated growth in donated resources is 2.8 percent with every one-unit increase in the regulatory-quality index of the affected country in the full model with random effects. Table 4, model 5 and table 5, model 10 offer similar direction in the moderating effect of regulatory quality. However, the magnitude of such effects is smaller.

Additional Robustness Tests and Mitigating Endogeneity Concerns

Predictor Variables. As discussed, we estimated models where the baseline predictor is only one factor (either the share of affiliates, employees, or revenue by MNE, country, and year), a separate measure adjusted by ownership proportion, one with a polynomial expansion in the three factors, and one excluding headquarters effects. These tests replicate the size and direction of *economic importance* and the moderating variables. These results and description of the analyses are in the Appendix at https://www.institutionaldisruptions.org/.

Matched Sample. One concern regarding the findings is that the decision to enter a country is endogenous to the likelihood of responding to institutional disruptions. That is, given the geographical (and, thus, political, and socioeconomic) heterogeneity in the context of exposure to country disruptions, firms with a similar propensity to donate self-select into specific institutional environments. The statistical

problem here is that the organizational behavior and economic importance are both moving in the same direction as an unobserved factor (e.g., disaster-risk aversion).

To mitigate this risk, we applied *coarsened exact matching* (CEM) (Iacus et al. 2011) to balance the baseline propensity to donate between the treatment (i.e., firms with at least one affiliate in the affected country) and the control groups (i.e., firms with no affiliates). The matching uses variables that the extant literature has identified as potential drivers of corporate philanthropy—as discussed in the previous section: *ROA, Tobins'q, total assets, total revenue, number of employees, R&D Intensity, advertising and administrative expenses, consumer orientation, and industry.* While we are unable to rule out the existence of all unobservable factors and therefore are careful in our interpretation of the results, the CEM provides additional information that is consistent with our theory. The main results hold with the matched database as shown in the Appendix at https://www.institutionaldisruptions.org/.

Controlling for Omitted Variables and Confounders

Other Strategic Considerations

Is it the Pursuit of Reputation? A stream in the non-market literature explains that decision makers engage in philanthropy with the goal of boosting their firms' reputation (Exley 2018). Muller and Kräussl (2011), for instance, proxy reputation for social irresponsibility with the number of concerns in the database Kinder, Lydenberg, and Domini for 442 U.S. firms and find that negative scores are associated with a relatively high likelihood of donating in the aftermath of Hurricane Katrina. To test for the possibility that MNEs' pursuit of reputational capital sufficiently explains variance in donations, we calculated a Janis-Fadner coefficient of imbalance (JFC)—a widely used variable of media reputation (see Lamin and Zaheer 2012, Love et al. 2017 for surveys in the organization literature). We use natural language processing to quantify the tone or sentiment of media reports in Factiva mentioning each MNE in our sample in a period of one year before the start date of the disruption. The JFC shows the proportion of negative versus positive articles. See the Appendix for the exact formula and further details on the procedure. Table 2 in the

Appendix shows that reputation becomes statistically insignificant when the model includes economic importance. An interaction of the two variables, whose effect is sizeable ($p<0.01$), indicates that the economic importance of the country to the MNE is a precondition for the pursuit of reputation. The results suggest that economic importance mediates the effects of the pursuit of reputation on donating in this context.

Is it the Pursuit of Political Favors? Another prediction is that organizations construct their non-market behavior in accordance with signals coming from influential local government actors (Luo and Chung 2013, Marquis and Qian 2013, Zhang et al. 2016, Zhang and Luo 2013). Managers acting strategically invest in government transferences (e.g., operation privileges) to improve their market standing [i.e., rent-seeking and special interest groups may develop (Olson 1971)]. Under this argument, when the domestic government allocates aid, managers will increase their giving to seek its preference and capture public transferences (Zhang et al. 2016, Zhang and Luo 2013). Following this logic, the analyses for H3 systematically reject the likelihood of such motive being a part of the studied donations.

Is it the Pursuit of Market Standing? A long-standing argument in the non-market literature is that corporations engage in philanthropy to increase their market performance. The strength of this motive is inversely proportional to market standing. Therefore, one expectation is that low-standing organizations should donate relatively large amounts because the marginal utility of such behavior is higher for them than for higher-standing firms (Eichholtz et al. 2010, Liang and Renneboog 2017, Muller and Kräussl 2011, Porter and Kramer 2002, Servaes and Tamayo 2013). To address this potential confounder, we proxied market standing by the rank of the MNE by firm revenue the year before the disruption. Table 4 in the Appendix shows that the coefficient of an interaction with *economic importance* suggests that the associated donations from economically connected MNEs fall with every standard-deviation decrease in *market standing*. Furthermore, the results for H2 provides additional evidence as MNEs with economic importance operating in concentrated markets donated greater amounts than those in fragmented markets.

Social Preferences

Is it Altruism or Reciprocity? According to arguments on social preferences, firms may donate in response to social preferences from internal stakeholders. For instance, the reciprocal motives of employees may lead the philanthropic behavior of MNEs more than the goal of restoring economic institutions (Charness and Rabin 2002, Fehr and Fischbacher 2002, Small and Simonsohn 2008). The risk of this confounder is important in our setting given that research has shown that people react more strongly to shock-related losses than to chronic conditions (Small 2010). To assess this, we use our proprietary database to incorporate *employee-driven donation*, a binary variable that takes value "1" when the firm donation was initiated by the employees through a matching program. The coefficient of the interaction of this variable with *economic importance* is statistically significant and negative (Table 5 in the Appendix) suggesting that when our studied MNEs donated following an initiative by employees, the donation amount was significantly lower than when not.

To further test the argument that business decision makers donate to satisfy altruistic motives, we construct a measure of the relative magnitude of *human to economic loss*. We found that the amount of donation decreases in the interaction with *economic importance* (Table 6 in the Appendix). The result is consistent with the skewness of donations to institutional disruptions with substantial economic costs vis-à-vis human impacts across the events in the period 1997 to 2018 as documented in the Appendix.

Is it Media Salience? Studies have shown the influence of media on humanitarian aid and that this influence is heterogeneous across events and skewed to some type of disasters (e.g., earthquakes) and countries (e.g., higher income) (Eisensee and Strömberg 2007, Franks 2013). For some institutional disruptions, economic importance may have a negligible effect because of the magnitude of news coverage. Events such as the 2017 Hurricane Maria in Puerto Rico and the 2011 earthquake and tsunami in Japan were certain to receive firm aid irrespective of the economic importance of the country to the MNE. We thus followed (Stromberg 2007) and reran the analyses with only disruptions that had a probability of being in the news of 50 percent and lower. The magnitude and direction of the estimates held (Table 7 in the Appendix).

Is it the Social Pressure Coming from Local Presence? Neo-institutionalism centers on the argument that firms are embedded in societal arrangements that foster their cognitive membership to communities (Marquis et al. 2013). Hence, a normative pressure on the organization exerts a particular influence in the philanthropy of the geographically proximate organization (Zhang and Luo 2013). MNEs may donate to achieve the approval of the local community [i.e., social license to operate (Boutilier and Thomson 2011, Wilburn and Wilburn 2011)]. The physical presence of the organization may be a simpler explanation and economic importance would be a second-order measure captured by differentiating firms based on geographic presence. We tested this idea using the binary variable *physical presence* taking value "1" when the firm has any type of affiliate in the focal country. Results in Table 8 in the Appendix suggest that the mechanism driving this form of corporate non-market behavior is more complex than local presence alone and that the measure of *economic importance* better captures such complexity.

Is it Inequity or Poverty Aversion? Firms may allocate resources to the goal of reducing financial disparity (Camerer and Fehr 2005, Fehr et al. 2006). If this preference was stronger than restoring economic institutions, MNE philanthropy would be comparatively greater in countries with high levels of poverty where economic inequality is pervasive. To test this argument, we regressed an interaction of *economic importance* and *poverty* using the poverty headcount ratio at $3.20 a day (2011 PPP) (as a percentage of population) from the WDI (see Anand and Sen 2000 for a discussion on this variable). We found that MNEs in the sample donated in a lower magnitude to poorer countries than to higher-income countries (Table 9 in the Appendix at https://institutionaldisruptions.org/).

Discussion and Conclusion

This study draws upon insights from institutional economics to investigate how the strategic value of a country for the firm motivates MNE philanthropy in the aftermath of sudden, unexpected, severe, and systemic disruptions that temporally breakdown economic institutions. The theoretical argumentation predicts the set of MNEs that will become substantial donors by pointing to an organizational motive previously overlooked by scholars. Organizations facing the prospect of performance shocks due to the

economic importance of the affected country to the firm will allocate cash or in-kind resources to help restore the affected goods necessary for market operation. The findings of our analyses suggest that accounting for economic importance of country markets for firms can enhance our understanding of company philanthropy.

This study is relevant to two contemporaneous developments in the literature. First, scholars have recently produced compelling evidence of the causal effect of shocks such as epidemic outbreaks, natural disasters, and terrorism, on firm performance and economic development. Second, there is rapidly growing organizational, management, and strategy research on the role of for-profit organizations addressing grand challenges. We posit that the acute nature of institutional disruptions leads to firm nonmarket behavior that differs from that under stable, chronic institutional contexts.

Nonmarket Strategy Toward Institutional Disruptions

Our theory and findings facilitate a greater understanding of the organizational and context-based characteristics that affect philanthropy toward institutional disruptions. The results suggest that the motives of pursuing reputation, meeting institutional pressures, achieving market standing or media attention, or satisfying reciprocal and altruistic goals do not replicate the explanatory power of the economic importance of a country to the MNE. Although company philanthropy toward institutional disruptions may still result in a warm glow or rents via a signal of product quality, increases in labor productivity, and willingness to pay, restoring economic institutions seems to exercise a more direct influence on donations. In this sense, the analyses systematically suggest that economic importance may mediate several strategic considerations and social preferences.

This is important because our findings also indicate that nonmarket behavior under disruptions does not fit well-accepted predictions. For instance, a widely accepted argument is that firms in fragmented markets have greater incentives to engage in philanthropy because the potential returns to differentiation are larger than in concentrated markets (Bénabou and Tirole 2006, Flammer 2015). According to the

prevailing logic, if there is a market demand for corporate nonmarket behavior that is discoverable for market competitors, firms will choose such behavior with the hope of achieving or sustaining a competitive advantage (Kaul and Luo 2017, Liang and Renneboog 2017). Yet, our results indicate that MNEs operating in concentrated markets are large suppliers of philanthropy to these acute grand challenges.

Additionally, the finding that MNE philanthropy is low when the capacity of the local government to fund recovery is high also points to the argument that firms seek to reestablish the functioning of economic institutions and not necessarily to foster stakeholder relationships. Extant work suggests that firms often align their nonmarket behavior to government action with the hopes of capturing rents (Marquis et al. 2016, Zhang et al. 2016). This rent-seeking behavior is more recurrent in countries with low institutional quality (Hornstein and Zhao 2018). Yet, consistent with our theory, the results suggest that MNEs substantially donate more to institutional disruptions in economically important countries with high regulatory quality. Moreover, whereas institutional disruptions that have relatively large loss in human health receive greater publicity and thus provide a great opportunity to accumulate reputational capital (Eisensee and Strömberg 2007), robustness analyses suggest that this motive is not as important as the restoration of economic institutions.

This study adds to the growing literature on international nonmarket behavior (Aguilera et al. 2006, Dorobantu et al. 2017). Traditionally, company giving is evaluated within countries or with a few single-country events. This has constrained our understanding of how differences in the institutional environment affect organizational engagement in grand challenges. Furthermore, the literature has neglected the study of firms from emerging countries. The longitudinal characteristic of our dataset helps to mitigate the risks of measurement error and omitted-variable bias that have been a concern regarding the findings of observational studies (Liang and Renneboog 2017).

Contributions to the Literature on the Institutional Determinants of Organizational Behavior

Despite extensive research on the enduring absence of market-based institutions (i.e., voids) and evolutionary institutional contexts, the concept of institutional disruptions has yet to be fully developed. Formally considering the four characteristics that differentiate institutional disruptions can advance the understanding of how the institutional contexts affect organizational decision making. This is particularly pertinent to the study of MNEs that are increasingly exposed to a wide range of disruptions vis-à-vis domestic firms. Scholars have found that contexts of high environmental uncertainty and causal ambiguity are key to explain the organization of firms across countries and time (Bloom, Sadun, et al. 2018).

Our study is relevant to research on the role of firms as open systems intermediaries (Dutt et al. 2016). This growing stream of literature mostly focuses on emerging market contexts where the lack of market-based institutions is the norm. We extend this work to acute contexts that can occur across levels of country income and institutional development (Ballesteros and Gatignon 2019). Our results offer evidence that MNEs often serve as a form of institutional intermediary during country crises by injecting capital to reinstate the functioning of economic institutions. Moreover, a vast literature suggests that firms with large shares of the market seek to influence institutions in ways to enhance their profits, maintain voids, and restrict competition at the cost of broader societal welfare (Bonardi et al. 2005, Gawande and Bandyopadhyay 2000, Hillman et al. 2004, Schuler et al. 2002). Our study illuminates institutional conditions under which the action of monopolistic firms may align with societal goals.

Limitations

Important limitations and boundary conditions remain. First, we restrict the analyses to large, publicly traded firms. Although this type of organization accounted for nearly 90 percent of the recorded corporate donations over the observed period (and, thus, selection bias is mitigated), the philanthropy of smaller and/or private firms may follow different mechanisms. Second, our argumentation and empirics are at the country level whereas some disruptions may be regional- or state-specific. While our method to identify large crises that have systemic country-level effects assures construct validity with the concept of institutional disruptions, future work can use more fine-grained data to study the impact of more localized

institutional disruptions. Third, we are unable to differentiate between distinct kinds of donations with our data. Studies with more in-depth data can provide insight into whether the main effect varies across types. Finally, our measure of economic importance does not include exports and imports, and sporadic economic activity not represented by an affiliate in our firm-level database. It is likely that both intra- and inter-firm trade will increase the economic importance of a location and can cause a contagion effect across countries.

Practical Contributions

The awareness of the economic importance of institutional disruptions on the philanthropic behavior of MNEs connects with an important public-policy question. Given that institutional disruptions can create poverty traps and hamper economic development (Baker and Bloom 2013, Barro 2009, Weitzman 2011), the role of large MNEs has important implications for society. In the last two decades, no other sector has increased its participation in response to epidemics, natural disasters, and terrorist attacks more than business organizations, and particularly MNEs. In fact, during the World Humanitarian Summit in 2016, the Advisory Group of Experts appointed to offer suggestions to close the growing financial gap of disaster costs emphasized the need of an informational platform to give "*private companies…the vetted requirements*" of emergency funds (High-Level Panel on Humanitarian Financing 2016). Information on the organizational and institutional determinants of company philanthropy may help stimulate and coordinate the engagement of firms in the global endeavor of overcoming grand challenges.

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Tables and Figures

Table 1. List of constructs and variables

Construct	Variable		Source
	Dependent variable		
Donation	Ln(Donated Amount in USD)		Proprietary database
	Explanatory variable		
H1: Economic Importance	Proportion of affiliates in the affected country adjusted by ownership percentage to total MNE affiliates worldwide		Authors' calculation using data from Orbis
	Moderators		
H2: Market Concentration	Herfindahl–Hirschman Index of revenue: sum of squares of the revenue share of the largest five firms in the affected country		Authors' calculation using data from Orbis
H3: Public Aid	Foreign	Ln(Average of net official development assistance and official aid received (current US$) in the two years preceding the disruption)	World Development Indicators
	Local	Ln(Average of gross national expenditure (current US$) in the two years preceding the disruption)	World Development Indicators
H4: Regulatory Quality	Scale indicator measuring the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. The estimate ranges from 0 (weak) to 100 (strong)		World Governance Indicators
	Controls		
Firm	Performance and size: ROA (winsorized at 5%), Tobins'q (winsorized at 5%), ln (Total assets), ln(total revenue), ln (total employees). Propensity to donate and resources for the productivity of philanthropy: R&D intensity, ln(Advertising and Administrative expenses), consumer orientation (1=main activity is business-to-consumer) Industry forces= four-digit SIC MNE Donation Fatigue=number of disruption donations in the previous year		Orbis
Country	Ln(GDP PPP current international USD) ln(population), ln(land area in km^2), trade (% of GDP), percentage of urban population, control of corruption (percentile rank)		World Development Indicators, World Governance Indicators
Event	Disruption type, ln(number of people killed), affected=ln(number of people displaced or injured), damage=ln(economic damage) News pressure: the median number of minutes a news broadcast devotes to the top three news segments in a day" over the forty days after the disaster Disruptions in country= ln(number of disruptions by country in the year before the focal disruption) Disruptions worldwide= ln(number of disruptions at the international level in the year before the focal disruption)		EM-DAT, UNOCHA FTS, SwissRe

Construct		Variable		Source
		Robustness		
Economic Importance		Polynomial expansion in subsidiaries, revenue, and employees in the affected country		Authors' calculation using data from Orbis
		Proportion of revenue in the affected country adjusted by affiliate ownership to total MNE revenue		Authors' calculation using data from Orbis
		Proportion of employees in the affected country adjusted by affiliate ownership to total number of employees worldwide		Authors' calculation using data from Orbis
		Proportion of affiliates in the affected country without adjusting by ownership percentage to total MNE affiliates worldwide		Authors' calculation using data from Orbis
Public Aid	*Foreign*	Emergency aid coming from external national and multilateral agencies		Proprietary database
		1=there is an official appeal for international aid for the disaster reported by the United Nations.		UNOCHA FTS
	Local	Amount of disaster cost covered by the national government		Proprietary database
Reputation		Janis-Fadner coefficient of imbalance $JFC = \begin{cases} \frac{e^2-ec}{t^2} & if\ e > c \\ \frac{ec-c^2}{t^2} & if\ c > e \\ 0 & otherwise \end{cases}$ where, e = annual number of positive media reports pertaining to the firm; c = annual number of negative media reports, and t = e+c.		Authors' calculation and tracking using Factiva
Market standing		Rank of the MNE by firm revenue the before the disruption date		Orbis
Altruism or Reciprocity		Employee-driven Donation	1=the donation was initiated by the employees (and not the top management)	Proprietary database
		Human to Economic Loss	Number of deaths divided by economic damage	Authors' calculation using data from UNOCHA FTS and SwissRe
Physical Presence		Binary variable indicating if the firm has an affiliate in the affected country		Authors' calculation using data from Orbis
Degree of Poverty		Poverty headcount ratio at $3.20 a day (2011 PPP) (% of population)		World Development Indicators

Table 2. Descriptive Statistics

Variable	N	Mean	Standard Deviation	Min	Max
Economic Importance	505,710	0.021	0.113	0	0
Market Concentration	505,710	0.054	0.166	0	1
Local Public Aid (ln)	505,710	4.698	0.173	4	6
Foreign Public Aid (ln)	505,710	13.553	9.110	0	22
Regulatory Quality	505,710	54.296	26.367	0	100
Firm Controls					
ROA	505,710	4.120	5.801	-96	88
Tobins'q	505,710	0.821	0.989	0	21
Total Assets (ln)	505,710	16.624	1.559	0	22
Total Revenue (ln)	505,710	16.166	1.082	0	20
Number of Employees (ln)	505,710	10.122	1.316	0	15
R&D Intensity	505,710	1.452	3.755	0	80
Advertising and Administrative Expenses	505,710	15.395	15.942	0	19
Consumer Orientation	505,710	0.539	0.498	0	1
Industry (SIC)	505,710	4378.232	1762.237	139	9,721
MNE Donation Fatigue	505,710	0.079	0.391	0	10
Country Controls					
GDP (ln)	505,710	26.050	2.874	19	31
Population (ln)	505,710	16.641	2.507	10	21
Area (km2) (ln)	505,710	12.129	2.807	5	17
Trade (% of GDP)	505,710	75.912	47.898	0	405
Percentage Urban Population	505,710	56.204	22.673	10	100
Control of Corruption	505,710	51.721	28.120	1	100
Event Controls					
Earthquake	505,710	0.133	0.340	0	0
Epidemic	505,710	0.011	0.105	0	1
Extreme Temperature	505,710	0.033	0.180	0	1
Flood	505,710	0.441	0.496	0	1
Landslide	505,710	0.011	0.105	0	1
Mass Movement (Wet)	505,710	0.011	0.105	0	1
Storm	505,710	0.326	0.469	0	1
Volcanic Activity	505,710	0.007	0.086	0	1

Variable	N	Mean	Standard Deviation	Min	Max
Wildfire	505,710	0.026	0.159	0	1
Number of Deaths (ln)	505,710	3.002	2.393	0	12
Number of People Affected (ln)	505,710	9.468	4.438	0	18
Economic Damage (ln)	505,710	7.379	2.513	0	12
News Pressure	505,710	9.284	3.191	0	18
Disruptions Worldwide (ln)	505,710	3.158	0.298	2	4
Disruptions in Country (ln)	505,710	0.251	0.478	0	2

Table 3. Correlations

	Donation (ln)	Economic Importance	Market Concentration	Local Public Aid (ln)	Foreign Public Aid (ln)	Regulatory Quality
Donation (ln)	1.0000					
Economic Importance	0.2981	1.0000				
Market Concentration	0.0140	0.1605	1.0000			
Local Public Aid (ln)	-0.0151	-0.0848	0.1027	1.0000		
Foreign Public Aid (ln)	-0.0301	-0.1271	0.1165	0.1401	1.0000	
Regulatory Quality	0.0260	0.1343	-0.1446	-0.2434	-0.7761	1.0000

Figure 1. Distribution of disruptions and their consequences by year and country income level

Threshold of Country Income	As of July 2019, $ GNI Per Capita
Low income	<1,026
Lower-middle income	1,026 - 3,995
Upper-middle income	3,996 - 12,375
High income	> 12,375

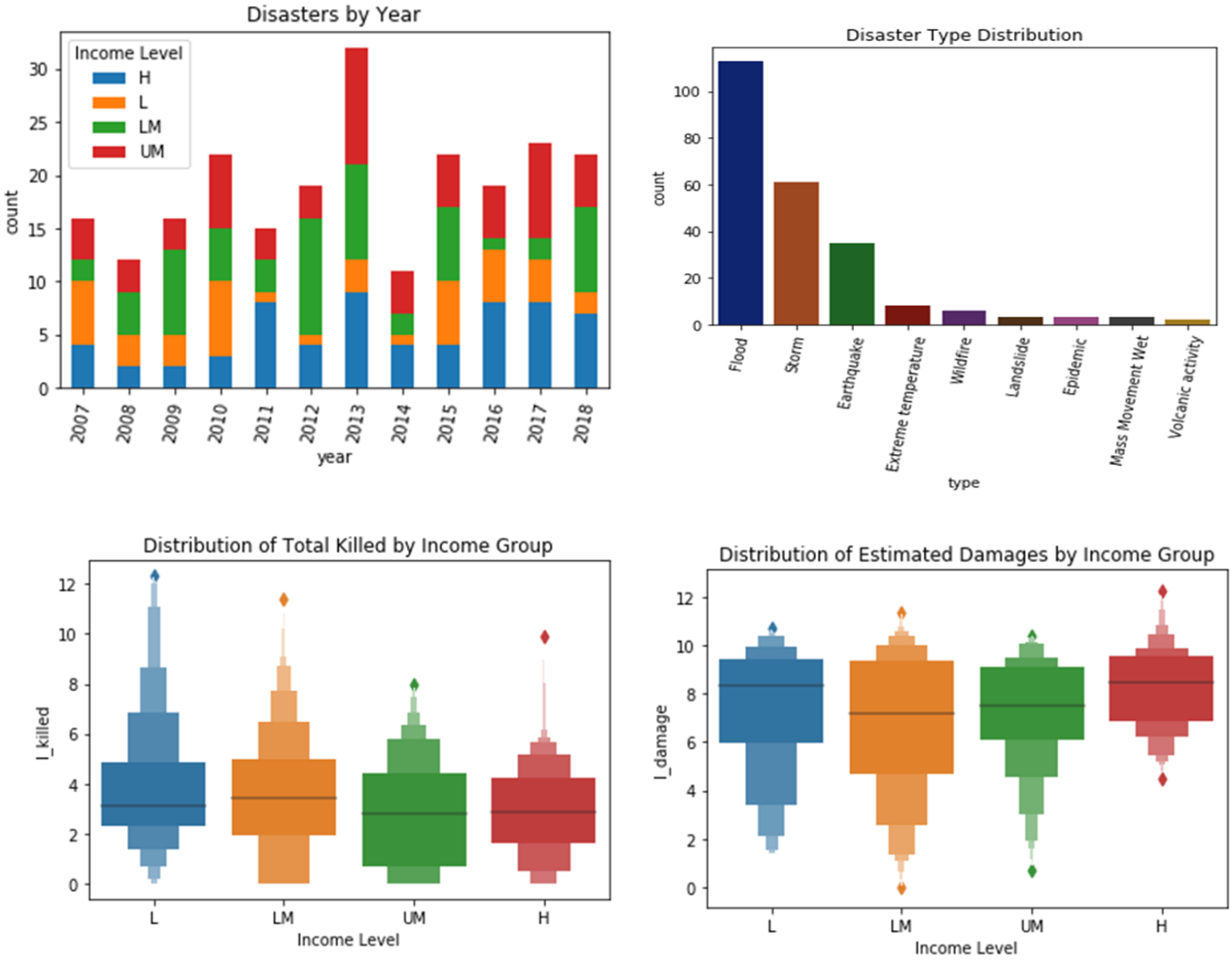

Figure 2. Overview of MNE data

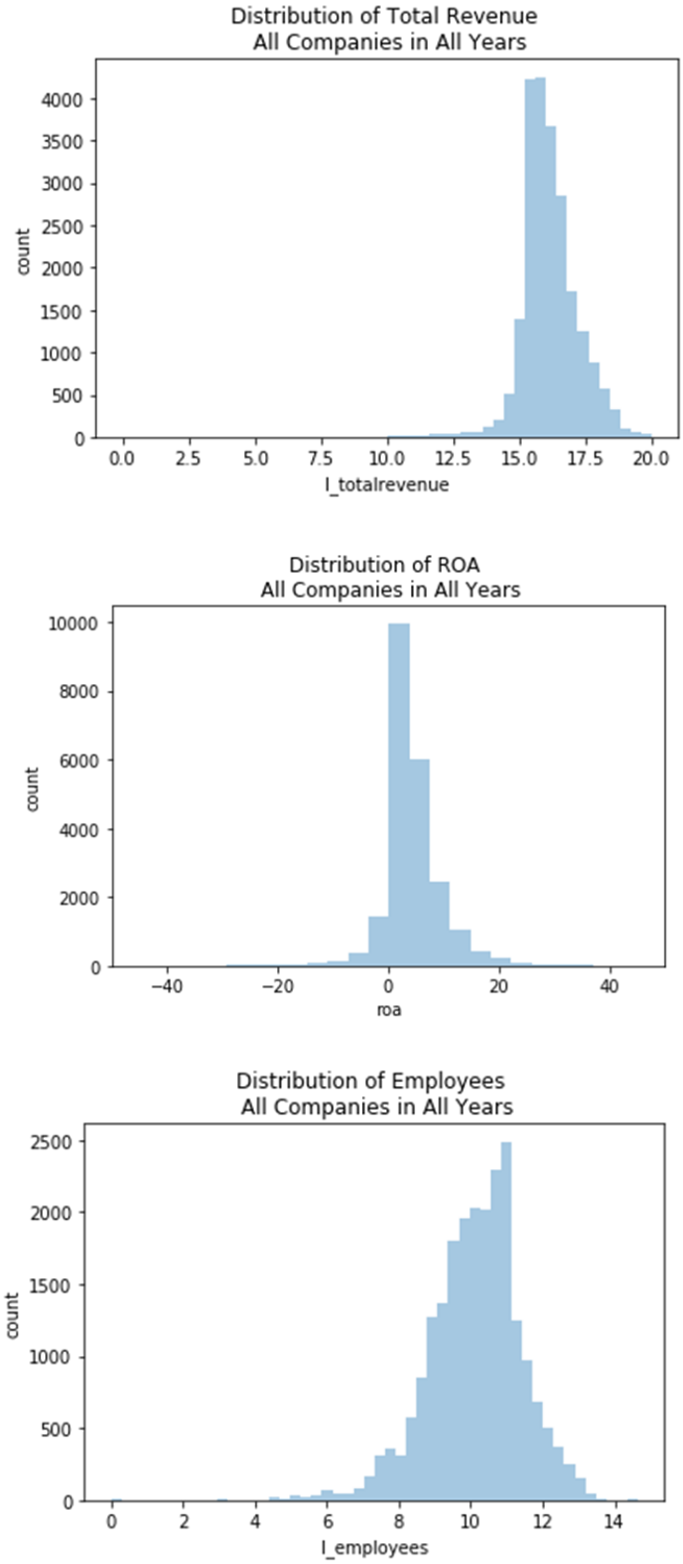

Figure 3. Overview of Country data

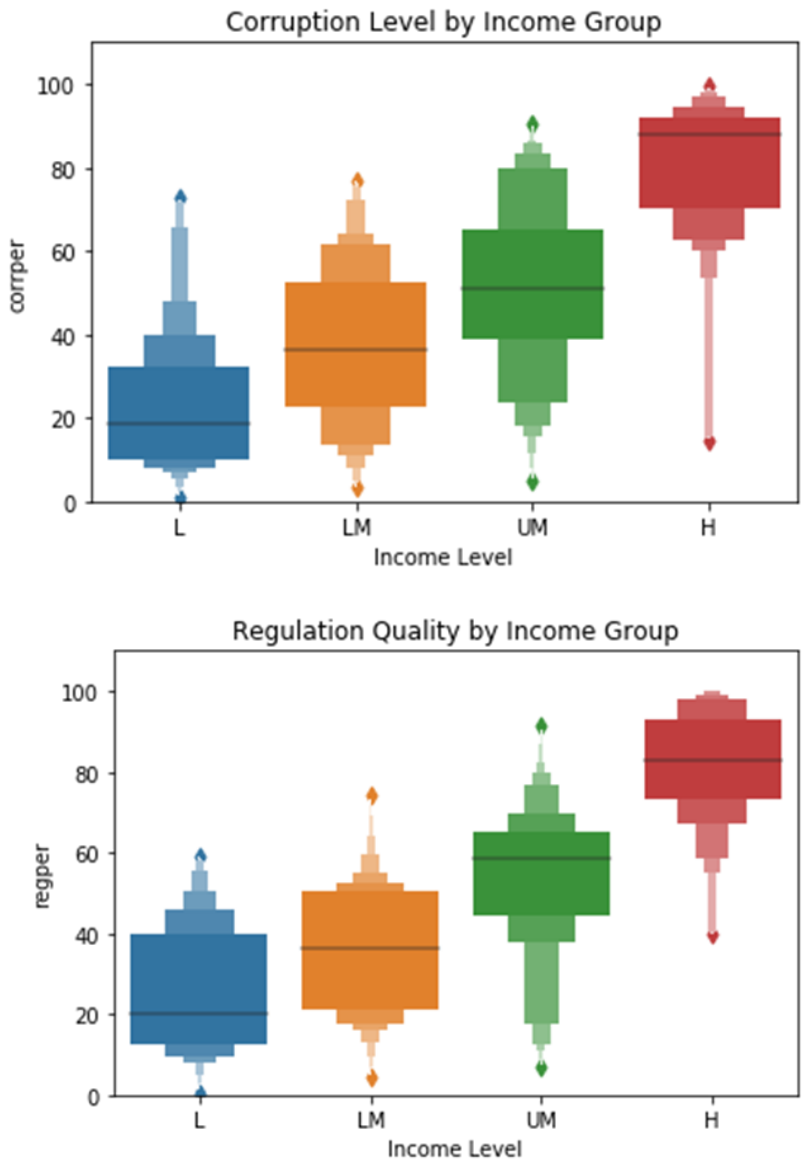

Table 4. Random-Effects Partial Models of the Effect of the Economic Importance of the Country on Donations to Disruptions

[Predicted Variable: USD Donation Amount (ln)]

Random-Effects Partial Models **Variables**	**(1)** **Controls**	**(2)** **Economic Importance**	**(3)** **EI x Market Concentration**	**(4)** **EI x Public Aid**	**(5)** **EI x Regulatory Quality**
H1: Economic Importance		0.646***	0.634***	17.187***	-0.012
		(0.010)	(0.010)	(1.976)	(0.033)
H2: EI x Concentration			84.935***		
			(4.481)		
H3: EI x Local Public Aid (ln)				-3.536***	
				(0.426)	
H3: EI x Foreign Public Aid (ln)				-0.027***	
				(0.001)	
H4: EI x Regulatory Quality (Percentile Rank)					0.009***
					(0.000)
Market Concentration			0.034***		
			(0.008)		
Local Public Aid (ln)				0.061***	
				(0.009)	
Foreign Public Aid (ln)				-0.002***	
				(0.000)	
Regulatory Quality (Percentile Rank)					0.000
					(0.000)
Firm Controls					
ROA	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobins'q	0.008***	0.009***	0.009***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Total Assets (ln)	0.005***	0.006***	0.006***	0.006***	0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Total Revenue (ln)	0.008***	0.008***	0.009***	0.008***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Number of Employees (ln)	0.004***	0.005***	0.005***	0.006***	0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
R&D Intensity	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Random-Effects Partial Models Variables	(1) Controls	(2) Economic Importance	(3) EI x Market Concentration	(4) EI x Public Aid	(5) EI x Regulatory Quality
Advertising and Administrative Expenses	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Consumer Orientation	-0.000	-0.006**	-0.007***	-0.009***	-0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Industry (SIC)	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
MNE Donation Fatigue	0.205***	0.201***	0.201***	0.201***	0.200***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Country Controls					
GDP (ln)	-0.007***	-0.008***	-0.008***	-0.012***	-0.008***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population (ln)	0.011***	0.007***	0.009***	0.014***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Area (km2) (ln)	-0.002**	-0.004***	-0.005***	-0.005***	-0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Trade (% of GDP)	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Percentage Urban Population	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control of Corruption	0.001***	0.000***	0.000***	0.000	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Event Controls					
Earthquake	0.078***	0.066***	0.066***	0.075***	0.077***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Epidemic	-0.074***	-0.069***	-0.070***	-0.062***	-0.064***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Extreme Temperature	-0.084***	-0.081***	-0.082***	-0.071***	-0.073***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Flood	0.001	0.001	-0.000	0.007	0.004
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Landslide	-0.060***	-0.059***	-0.061***	-0.055***	-0.055***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Mass Movement (Wet)	-0.042***	-0.069***	-0.069***	-0.053***	-0.054***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Storm	0.035***	0.029***	0.028***	0.031***	0.030***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)

Random-Effects Partial Models **Variables**	**(1)** **Controls**	**(2)** **Economic Importance**	**(3)** **EI x Market Concentration**	**(4)** **EI x Public Aid**	**(5)** **EI x Regulatory Quality**
Volcanic Activity	0.007	0.006	-0.001	0.014	0.008
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Number of Deaths (ln)	0.026***	0.028***	0.028***	0.027***	0.027***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Number of People Affected (ln)	-0.003***	-0.003***	-0.003***	-0.002***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Economic Damage (ln)	0.009***	0.009***	0.009***	0.008***	0.008***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
News Pressure	0.006***	0.005***	0.006***	0.005***	0.005***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Disruptions Worldwide (ln)	-0.001	-0.008*	-0.011***	0.000	-0.004
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Disruptions in Country (ln)	0.006**	-0.009***	-0.008***	-0.014***	-0.011***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Disruption: Wildfire = o,	-	-	-	-	-
Industry (SIC) = o,					
Firm fixed effects	No	No	No	No	No
Time fixed effects	No	No	No	No	No
Country fixed effects	No	No	No	No	No
Constant	-0.493***	-0.387***	-0.390***	-0.648***	-0.389***
	(0.028)	(0.028)	(0.028)	(0.054)	(0.028)
Observations	505,710	505,710	505,710	505,710	505,710
Number of MNEs	1,873	1,873	1,873	1,873	1,873

Bootstrapped standard errors clustered by MNE in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 5. Fixed-Effects Partial Models of the Effect of the Economic Importance of the Country on Donations to Disruptions

[Predicted Variable: USD Donation Amount (ln)]

Fixed-Effects Partial Models **Variables**	**(6)** **Controls**	**(7)** **Economic Importance**	**(8)** **EI x Market Concentration**	**(9)** **EI x Aid**	**(10)** **EI x Regulatory Quality**
H1: Economic Importance		0.650***	0.639***	17.011***	-0.009
		(0.010)	(0.010)	(1.975)	(0.034)
H2: EI x Market Concentration			82.206***		
			(4.458)		
H3: EI x Local Public Aid (ln)				-3.497***	
				(0.426)	
H3: EI x Foreign Public Aid (ln)				-0.026***	
				(0.001)	
H4: EI x Regulatory Quality					0.009***
					(0.000)
Market Concentration			0.028***		
			(0.008)		
Local Public Aid (ln)				0.055***	
				(0.009)	
Foreign Public Aid (ln)				-0.002***	
				(0.000)	
Regulatory Quality					0.000**
					(0.000)
Firm Controls					
ROA	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Tobins'q	0.003	0.003	0.003	0.002	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Total Assets (ln)	0.000	0.002	0.002	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Total Revenue (ln)	0.001	0.002	0.002	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Number of Employees (ln)	0.000	-0.000	-0.000	-0.000	-0.000
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
R&D Intensity	-0.002	-0.002	-0.002	-0.002	-0.002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)

Fixed-Effects Partial Models **Variables**	**(6)** **Controls**	**(7)** **Economic Importance**	**(8)** **EI x Market Concentration**	**(9)** **EI x Aid**	**(10)** **EI x Regulatory Quality**
Advertising and Administrative Expenses	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Consumer Orientation	0.029***	0.017***	0.015***	0.012**	0.013***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Industry (SIC)					
MNE Donation Fatigue	0.023***	0.021***	0.022***	0.021***	0.021***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Country Controls					
GDP (ln)	-0.006***	-0.007***	-0.007***	-0.011***	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Population (ln)	0.011***	0.007***	0.009***	0.014***	0.008***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Area (km2) (ln)	-0.002**	-0.005***	-0.005***	-0.005***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Trade (% of GDP)	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Percentage Urban Population	0.001***	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Control of Corruption	0.001***	0.000***	0.000***	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Event Controls					
Earthquake	0.072***	0.060***	0.060***	0.069***	0.072***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Epidemic	-0.075***	-0.071***	-0.071***	-0.064***	-0.065***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Extreme Temperature	-0.087***	-0.083***	-0.084***	-0.073***	-0.074***
	(0.010)	(0.009)	(0.009)	(0.009)	(0.010)
Flood	-0.003	-0.003	-0.004	0.003	0.000
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Landslide	-0.059***	-0.058***	-0.059***	-0.052***	-0.053***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Mass Movement (Wet)	-0.055***	-0.081***	-0.082***	-0.066***	-0.067***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Storm	0.032***	0.026***	0.024***	0.028***	0.026***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)

Fixed-Effects Partial Models **Variables**	**(6)** **Controls**	**(7)** **Economic Importance**	**(8)** **EI x Market Concentration**	**(9)** **EI x Aid**	**(10)** **EI x Regulatory Quality**
Volcanic Activity	0.002	0.001	-0.004	0.010	0.005
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Number of Deaths (ln)	0.026***	0.027***	0.027***	0.027***	0.027***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Number of People Affected (ln)	-0.003***	-0.003***	-0.003***	-0.002***	-0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Economic Damage (ln)	0.009***	0.009***	0.008***	0.008***	0.008***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
News Pressure	0.007***	0.006***	0.006***	0.006***	0.006***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Disruptions Worldwide (ln)	-0.015***	-0.019***	-0.022***	-0.011***	-0.016***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Disruptions in Country (ln)	0.007**	-0.008***	-0.007***	-0.014***	-0.010***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Disruption: Wildfire = o,	-	-	-	-	-
Industry (SIC) = o,	-	-	-	-	-
Firm fixed effects	Yes	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	-0.211***	-0.116**	-0.119**	-0.332***	-0.095*
	(0.052)	(0.052)	(0.052)	(0.069)	(0.052)
Observations	505,710	505,710	505,710	505,710	505,710
Adjusted R-squared	0.499	0.785	0.840	0.818	0.834
Number of MNEs	1,873	1,873	1,873	1,873	1,873

Bootstrapped standard errors clustered by MNE in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 6. Full Models of the Effect of Economic Importance of the Country on the Magnitude of Donation to Disruptions
[Predicted Variable: USD Donation Amount (ln)]

Full Models **Variables**	**(11)** **Random Effects**	**(12)** **Fixed Effects**
H1: Economic Importance	23.779***	23.463***
	(1.992)	(1.992)
H2: EI x Concentration	97.010***	94.088***
	(4.522)	(4.498)
H3: EI x Local Public Aid (ln)	-5.500***	-5.428***
	(0.433)	(0.433)
H3: EI x Foreign Public Aid (ln)	0.032***	0.031***
	(0.004)	(0.004)
H4: EI x Regulatory Quality (Percentile Rank)	0.028***	0.028***
	(0.002)	(0.002)
Market Concentration	0.040***	0.034***
	(0.008)	(0.008)
Local Public Aid (ln)	0.069***	0.063***
	(0.009)	(0.009)
Foreign Public Aid (ln)	-0.002***	-0.002***
	(0.000)	(0.000)
Regulatory Quality (Percentile Rank)	0.000	0.000
	(0.000)	(0.000)
Firm Controls		
ROA	0.000	-0.000
	(0.000)	(0.000)
Tobins'q	0.008***	0.002
	(0.001)	(0.003)
Total Assets (ln)	0.006***	0.001
	(0.001)	(0.003)
Total Revenue (ln)	0.008***	0.002
	(0.002)	(0.003)
Number of Employees (ln)	0.006***	-0.000
	(0.001)	(0.003)
R&D Intensity	0.002***	-0.002
	(0.000)	(0.001)
Advertising and Administrative Expenses	0.000***	0.000***
	(0.000)	(0.000)
Consumer Orientation	-0.010***	0.009**
	(0.003)	(0.005)
Industry (SIC)	0.000***	
	(0.000)	
MNE Donation Fatigue	0.200***	0.021***
	(0.003)	(0.003)
Country Controls		
GDP (ln)	-0.013***	-0.013***
	(0.001)	(0.001)
Population (ln)	0.017***	0.016***
	(0.002)	(0.002)
Area (km2) (ln)	-0.005***	-0.005***
	(0.001)	(0.001)
Trade (% of GDP)	-0.000***	-0.000***
	(0.000)	(0.000)
Percentage Urban Population	0.001***	0.001***

Full Models **Variables**	**(11)** **Random Effects**	**(12)** **Fixed Effects**
	(0.000)	(0.000)
Control of Corruption	0.000	-0.000
	(0.000)	(0.000)
Event Controls		
Earthquake	0.077***	0.072***
	(0.008)	(0.008)
Epidemic	-0.061***	-0.062***
	(0.013)	(0.013)
Extreme Temperature	-0.069***	-0.070***
	(0.010)	(0.010)
Flood	0.009	0.006
	(0.008)	(0.007)
Landslide	-0.055***	-0.052***
	(0.013)	(0.013)
Mass Movement (Wet)	-0.057***	-0.070***
	(0.013)	(0.013)
Storm	0.032***	0.028***
	(0.007)	(0.007)
Volcanic Activity	0.010	0.008
	(0.015)	(0.015)
Number of Deaths (ln)	0.027***	0.027***
	(0.001)	(0.001)
Number of People Affected (ln)	-0.002***	-0.002***
	(0.000)	(0.000)
Economic Damage (ln)	0.008***	0.008***
	(0.000)	(0.000)
News Pressure	0.006***	0.006***
	(0.000)	(0.000)
Disruptions Worldwide (ln)	-0.003	-0.013***
	(0.004)	(0.004)
Disruptions in Country (ln)	-0.014***	-0.014***
	(0.003)	(0.003)
Disruption: Wildfire = o,	-	-
Industry (SIC) = o,		-
Firm fixed effects	No	Yes
Time fixed effects	No	Yes
Country fixed effects	No	Yes
Constant	-0.690***	-0.370***
	(0.054)	(0.069)
Observations	505,710	505,710
Adjusted R-squared		0.892
Number of MNEs	1,873	1,873

Bootstrapped standard errors clustered by MNE in parentheses *** p<0.01, ** p<0.05, * p<0.1

Endnotes

[i] This study builds on institutional economics (Coase 1960, Dorobantu et al. 2017, Luo and Kaul 2019, Williamson 2000) because it most closely aligns with information collected in interviews. However, we acknowledge that alternative theoretical approaches such as public goods and resource dependence theories may also apply.

[ii] Our conceptualization of economic institutions is consistent with Coase's (1988) view that "markets are institutions that facilitate the exchange of goods" (p. 7).

[iii] Existing research on institutional changes focuses on evolutionary alterations to the political system and formal institutions that primarily occur incrementally but may (more rarely) be punctuated changes (Peng 2003). These evolutionary changes, which include turbulence (Chittoor et al. 2009), upheavals (Newman 2000), transitions (Peng 2003, Steensma et al. 2005), and traumatic shocks (Klüppel et al. 2018), result in persistent novel institutional states that require firms that operate in the country to adapt their strategy and/or structure (Aguilera and Grøgaard 2019).

[iv] Local public aid primarily is sourced from the national governments and allocated to multilateral agencies or to local governments who in turn distribute the funds. Given that our measure of institutional disruption is based on the most severe, high-magnitude disasters, we expect the national government to intervene and be the primary contributor to aid for recovery.

[v] Information on whether the headquarters or affiliate donated are not systematically reported and therefore we focus on donations at the MNE level.

[vi] The United Nations Office for the Coordination of Humanitarian Affairs (UNOCHA) manages the FTS database on humanitarian funding. The database contains information on government donors, UN-administered funds and agencies, NGOs and other humanitarian actors and partners.

[vii] Institution supported by the World Health Organization that represents a comprehensive international database on catastrophes. Events included in the International Disaster Database must meet at least one of the following criteria: 10 or more people killed, 100 or more people affected, a declaration of a state of emergency, or a call for international assistance. Further information can be accessed at http://www.emdat.be/.

[viii] Despite being the most used disaster database in empirical studies, EM-DAT has pervasive data inaccuracies and missingness. A substantial part of our work was dedicated to collect disruptions and we received critical assistance from UNOCHA and Swiss Re. We conducted separate checks with different members of the research team (see the Appendix) aimed at checking data accuracy.

[ix] https://datahelpdesk.worldbank.org/knowledgebase/articles/378833-how-are-the-income-group-thresholds-determined.

[x] Using only Orbis firm data or using only Lexis Nexis Directory of Corporate Affiliate data yield consistent results as those reported for the combined dataset.

[xi] The World Development Indicators database contains high quality and internationally compatible statistics on 1,600 time-series indicators for 217 economies and more than 40 country groups. The database is compiled by the World Bank.

[xii] According to the World Bank, the WGI is a research dataset summarizing the views on the quality of governance provided by a large number of enterprise, citizen, and expert survey respondents in industrial and developing countries. The six broad dimensions of governance that comprise the WGI are rule of law, voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, and control of corruption (Kaufmann et al. 2011).

[xiii] Orbis does not separate advertising and marketing from general and administrative expenditures. Therefore, we relied on the full measure of advertising and general and administrative expenses for our control variable.

[xiv] Of note, endogeneity is a concern when regressing measures of disruption because they are may be a function of philanthropic response—and vice versa. The following subsections explain the methods to account for this risk.