Do More Corrupt Countries Receive Less Disaster Relief?

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While humanitarian considerations play a role in the decision to grant relief to countries affected by natural disasters, donors may be less likely to provide assistance to countries they perceive as corrupt out of a belief that it will not reach the victims. This paper tests the relationship between perceptions of corruption and disaster relief by both the U.S. and the international community using different indices of corruption. The results suggest that a higher risk from corruption reduces the likelihood of U.S. The relationship between corruption and international relief, however, is found to be insignificant. Finally, the results indicate that the effect of corruption on aid varies depending on the type of disaster.

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1. Introduction

Natural disasters have seemingly increased in frequency, and growing population in disaster-prone areas has only made them more catastrophic. As a result, the amount of disaster relief provided by the U.S. and other countries has been increasing, somewhat in line with the increased casualties. For example, in 1993 the U.S. provided, on average, $18,185 (in constant 2000 dollars) in aid per disaster. By 2005, that figure had increased to $193,679. In the meantime, an average of 97 people were killed in each of the 215 natural disasters that took place in 1993; by 2005, an average of 236 people lost their lives in 384 disasters.[1] At first glance, then, it seems that the increase in disaster relief does reflect the increased humanitarian need. However, the effectiveness of relief may depend on the perception of corruption in a country, and this risk could potentially make donors think twice before providing sufficient aid to help the victims.

The link between corruption perception and foreign development aid has been examined before in the literature. Alesina and Weder (2002), for instance find no evidence that less corrupt governments receive more foreign aid, though they do find that corruption is positively correlated with U.S. aid. But the link between corruption perception and disaster relief, and in particular whether corruption affects disaster relief allocation, has yet to be explored.[2] This paper then seeks to fill that gap by examining whether corruption in the affected country has an impact on the likelihood of response to a disaster by a donor country, as well as on the amount of aid received by an affected country, and whether that effect differs by type of disaster.

[1] Calculations by the author using data from the Office of U.S. Foreign Disaster Assistance's (OFDA) Annual Reports, matched to data from the Centre for Research on the Epidemiology of Disasters' (CRED) Emergency Disasters Data Base (EM-DAT).
[2] The effect of disaster relief on corruption, however, has been explored before. In particular, Leeson and Sobel (forthcoming) find that increases in annual FEMA payments increase corruption.

There are various possible reasons why disaster relief may respond to the perceived level of corruption in the affected country. For one, the literature on the determinants of disaster aid has found that relief is affected by political considerations.[3] Garrett and Sobel (2003), for example, find that states will have a higher rate of disaster declarations the more politically important they are for the president. Furthermore, disaster relief is higher in states that have congressional representation in FEMA oversight committees. In an analysis of U.S. foreign disaster assistance, Drury et al. (2005) find that foreign policy and domestic concerns are the primary determinants of relief, especially at the granting stage. It is likely, then, that domestic political interests may be taken into consideration when deciding whether to provide relief, especially since voters may not support providing aid to corrupt countries. In fact, the OFDA (Office of U.S. Foreign Disaster Assistance) specifically states that one of its conditions for granting aid is that it be in the interest of the U.S. government (OFDA FY 2006 Annual Report).

In terms of foreign development aid in general, the literature has shown that aid is not granted for solely humanitarian reasons. Alesina and Dollar (2000) find that foreign aid tends to respond to political considerations such as colonial past and UN voting patterns, whereas foreign direct investment is more sensitive to economic motivations, especially the protection of property rights and good economic policy. They further find that U.S. foreign aid tends to be geared towards poor countries, democracies, and countries with open trade policies. Chong and Gradstein (2007) find that in foreign aid allocation, the donor country's economic conditions matter more than those of the recipient country. These results then suggest that aid is not granted for solely humanitarian reasons.

This paper is also related to the literature on the relationship between foreign direct investment (FDI) and corruption. Habib and Zurawicki (2002) find that corruption has a negative

[3] See also Strömberg (2007) for a survey of the literature.

impact on FDI, as foreign investors choose to avoid those countries with high corruption due to the risk associated with it. Similarly, Wei (2000) finds that U.S. investors are just as averse to corruption-prone countries as foreign ones. Finally, Harris and Ursprung (2002) find that FDI is higher in countries with greater civil and political freedoms. Since there is often a need for rebuilding an affected area's infrastructure following a disaster, disaster relief can considered be a form of investment. It could be, then, that donor countries decide to allocate less aid to more corrupt countries because they are more risky as an investment. However, an argument can be made that in the case of more corrupt countries, more aid is given to ensure that enough reaches the victims. The impact of corruption on disaster relief allocations is thus unclear.

This paper empirically tests whether perceptions of corruption in the recipient country matters in disaster aid allocations. I examine the disbursements of both U.S. disaster relief by the OFDA, as well as overall international aid as reported (on a voluntary basis) to the United Nations Office for the Coordination of Humanitarian Affairs (OCHA). In addition, I use four different measures of corruption, one of which specifically measures the political risk associated with corruption perception, while the remaining three are aggregates of several different indicators measuring corruption perceptions.

After including several controls and employing instrumental variable estimation to control for the possible endogeneity of corruption, as well as for measurement error, I find that the risk to investors from corruption is correlated with U.S. disaster relief but not international aid. In particular, the results suggest that countries with a higher risk associated with corruption are less likely to receive aid from the US, whereas the effect of corruption on international relief is insignificant. These results are robust across all specifications and to different sensitivity tests. This suggests that the U.S. does take corruption risk into account when making aid allocation decisions. Finally, I find that the effect of corruption on disaster relief differs depending on the type of disaster.

The paper is divided as follows. Section 2 provides a description of the data, while Section 3 presents the empirical specification. Section 4 examines the results and subjects them to a variety of sensitivity tests. The last section concludes.

2. Data

This section discusses the data used in the analysis. In particular, I describe the two sources used for constructing the two dependent variables, the four sources for the independent variable of interest, and the various control variables. Summary statistics on all indicators are provided in Table 1. Summary statistics by disaster are show in Table 2.

2.1. Disaster Aid

Data on disaster relief come from two sources.[4] The first one is the Office of U.S. Foreign Disaster Assistance's (OFDA) Annual Reports.[5] The OFDA is the branch of the United States Agency for International Development (USAID) that provides assistance for natural disasters and complex emergencies that meet the following criteria: "the magnitude of the disaster is beyond the capacity of the host country to respond; the host country is willing to accept assistance; and a response is in the interest of the [U.S. government]" (OFDA FY 2006 Annual Report). The OFDA-reported disaster assistance was converted into constant 2000

[4] I also tried using data from a third source, the OECD's Development Assistance Committee. Data from this source, however, are for emergency assistance, which includes not only the natural disasters included in this paper, but also the types excluded, along with famines and other complex emergencies. Given the inclusion of additional categories, the results using this dataset are different.

[5] http://www.usaid.gov/our_work/humanitarian_assistance/disaster_assistance/

dollars using the U.S. CPI, which was taken from the World Bank's World Development Indicators.

The second source is the United Nations Office for the Coordination of Humanitarian Affairs (OCHA). In particular, data are obtained from its ReliefWeb Financial Tracking Service (FTS), which is a database providing all reported international humanitarian aid.[6] Data on the amount of assistance by disaster are reported both by donor and in the aggregate. Donors include non-governmental organizations, bilateral assistance, in-kind assistance, and private donations. Note that because reporting is strictly voluntary, the data are far from comprehensive. For the purposes of this paper, I use the data from 1992 (the earliest available) to 2007. The data were converted into constant 2000 dollars using the ratio of real to current GDP (measured in dollars and taken from the World Bank's World Development Indicators) in the recipient country. In addition, I experiment with the aggregate measure of all relief provided to a particular country in response to a given disaster, as well as by donor country and an aggregate excluding assistance from non-governmental organizations and private donations.[7] The data for the latter two are from 2000-2007.

Two measures of relief are created from each data source. The first one is a dummy that takes a value of 1 if disaster aid was provided and zero otherwise. The second one is the log of actual amount of relief provided. Because the amount of aid is only reported when aid was provided, I code missing aid values as 0.[8]

[6] http://ocha.unog.ch/fts2/

[7] Note that the US is included in the aggregate data provided by the OCHA.

[8] In Appendix Table 5, I also check the relationship between corruption and disaster relief for the countries that did receive aid (in other words, excluding the missing observations).

2.2. Corruption

To measure corruption, I employ four different indicators. The first one is the International Country Risk Guide's corruption index; the second one Transparency International's corruption perception index; the third one Kaufmann et al.'s (2007) control of corruption indicator; and the last one the freedom from corruption component of the index of economic freedom published by the Heritage Foundation. These indices have been criticized for not being an accurate measure of corruption, but merely of perception (see, for instance, Lambdorff (2007) and Treisman (2007)). However, in this paper I am concerned with how a donor country's view of corruption in the recipient country affects its decision to provide disaster relief, so the relevant measure is the perception of corruption rather than the actual level. The indices employed in this paper, then, are appropriate for examining this issue.

2.2.1. ICRG Index

The International Country Risk Guide (ICRG) corruption index provides an appraisal of corruption within the political system. It is based on the opinion of experts, and aims to provide potential investors with an assessment of political risk. In other words, the index measures the risk associated with corruption, not the actual level of corruption.[9] This means that the index really captures whether the risk associated with corruption makes donors think twice before providing aid to an affected country.

The index varies from 0 to 6, with higher values denoting lower levels of corruption. The data are a simple average of monthly indices, which makes it continuous between 0 and 6. For

[9] Political Risk Services, which publishes the ICRG index, states that "the greatest risk in such corruption is that at some time it will become so overweening, or some major scandal will be suddenly revealed, as to provoke a popular backlash, resulting in a fall or overthrow of the government, a major reorganizing or restructuring of the country's political institutions, or, at worst, a breakdown in law and order, rendering the country ungovernable." See http://www.prsgroup.com/ICRG_Methodology.aspx.

ease of interpretation, I reverse the index and rescale it from 0 to 10 so that high values correspond to higher corruption levels. The data are available from 1984 to 2005.

One advantage of the ICRG index over other available indices is the fact that it is available for a long time period and for a large sample of countries. It is also highly correlated to other indices that have been used in the literature (see Treisman, 2000, for more details), which suggests that they are consistent despite being a subjective rating.

2.2.2. Transparency International

I also experiment with Transparency International's corruption perceptions index (CPI).[10] The CPI is available starting in 1996 and until 2007, but country coverage varies by year. This index is a composite of various surveys assessing corruption among public officials and politicians. In particular, Transparency International states that "the surveys used in compiling the CPI ask questions that relate to the misuse of public power for private benefit, for example bribery of public officials, kickbacks in public procurement, embezzlement of public funds) or questions that probe the strength of anti-corruption policies, thereby encompassing both administrative and political corruption."[11] As with the ICRG, I reverse the index so that 0 denotes low and 10 high corruption.

A major problem with the CPI is that year-to-year variations could result from changes in corruption perception, but also from changes in the sample of surveys included, as well the methodology used to construct the index. This means that it is difficult to say whether changes in score reflect changes in real levels of corruption, or the addition of new data or methodological differences. Results using this index, then, should be interpreted with caution.

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[10] See http://www.icgg.org
[11] http://www.icgg.org/corruption.cpi_2007_faq.html

2.2.3. Kaufmann et al. (2007)

As a further robustness check, I use the control of corruption indicator from Kaufmann et al.'s (2007) Governance Matters VI dataset. This index, produced by the World Bank, measures "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., 2007). The index is an aggregate constructed from several different sources. These include Economist Intelligence Unit, Political Risk Services, Afrobarometer, and the World Competitiveness Yearbook.[12] The index takes values from -2.5 to 2.5, with higher scores indicating lower corruption. To maintain consistency with the other indices used in this paper, I reverse and rescale the indicator so that values lie between 0 and 10, with higher values denoting higher corruption. The index is available for 1996, 1998, 2000, 2002-2006.

2.2.4. Heritage Foundation

I also test whether the freedom from corruption component of the Heritage Foundation's economic freedom index affects disaster relief.[13] In the case of countries covered by Transparency International's CPI, the index is equal to 10 times the CPI score (for instance, if a country's score in the CPI is 5.5, it is given a score of 55 in the Heritage Foundation index). For countries not covered by the CPI, the index relies on sources including the U.S. Department of Commerce, the Economist Intelligence Unit, *Country Commerce*, the Office of the U.S. Trade Representative, and official government publications of each country. The index is provided for 1995-2008.

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[12] See http://www.govindicators.org.
[13] See http://www.heritage.org/index/.

2.3. Disaster-Specific Controls

Information on disasters is taken from the Emergency Disasters Data Base (EM-DAT), which is maintained by the Centre for Research on the Epidemiology of Disasters (CRED) at the Université Catholique de Louvain.[14] Recorded disasters include natural, technological (such as transport accidents), and complex disasters (famines). For the purposes of this paper, I include only natural disasters, namely, earthquakes, floods, volcanoes, storms,[15] extreme temperature, landslides, and wild fires.[16] Disasters are reported in the database if at least one of the following criteria is met: (1) 10 or more people reported killed; (2) 10 or more people reported affected; (3) a state of emergency is declared; (4) international assistance is requested. From the database, I obtain measures of the number of people killed, the total number affected, as well as the number of disasters in a country in a given year.[17] In both cases, I use the natural log of the number of people in each category.

As for disaster frequency, I generate a count of the number of disasters that took place in a given country in a particular year, and averaged it over the previous three years so as to reflect a country's disaster propensity. As with the number of people killed and affected, I take natural logs of the disaster count. I include disaster frequency as a control variable in some cases to ensure that the effect of corruption on aid is not driven by how disaster prone a country is. Countries that experience more disasters may be more likely to suffer from high corruption, as constant rebuilding efforts generate more opportunities for bribes in the public sector.

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[14] http://www.em-dat.net/

[15] Under storms I include both windstorms as well as wave surges.

[16] I exclude epidemics, droughts, and insect infestation since their start dates are not consistent across the different datasets.

[17] The number of people killed is defined in the database as "persons confirmed as dead and persons missing and presumed dead (official figures when available)," while the total number affected is the sum of the number injured, homeless, and affected. Of these, the number injured are "people suffering from physical injuries, trauma or an illness requiring immediate medical treatment as a direct result of a disaster;" the number homeless include "people needing immediate assistance for shelter;" and the number affected is defined as "people requiring immediate assistance during a period of emergency; it can also include displaced or evacuated people."

2.4. News Coverage

Following Eisensee and Strömberg (2007), who find that greater media coverage increases the likelihood that a disaster receives assistance, I include an indicator for whether or not a disaster was covered in the news. The indicator is constructed using the Vanderbilt Television News Archive,[18] which provides the news broadcasts from ABC, CBS, NBC, FOX News, and CNN since 1968.[19] More specifically, I perform a keyword search of each disaster covered in CRED. I consider that the disaster was covered in the news if the headline or news abstract contains the name of the country and the type of disaster, and if the broadcast took place within 40 days from the start of the disaster. The dummy then takes a value of 1 if the disaster was covered in the news and zero otherwise.

2.5. Additional Controls

If disaster relief is driven by humanitarian motives, it should be geared towards large disasters in low-income countries (see Strömberg, 2007). However, those countries may also have poor infrastructure and high corruption, which limits the efficacy of aid (Collier and Dollar, 2002). Furthermore, Kahn (2005) finds that countries with higher income, better institutions, less inequality, and that are more democratic, suffer less deaths from natural disasters, even if they do not experience a smaller number of disasters. This suggests that these countries are likely to receive less relief. Similarly, Anbarci et al. (2005) find that there are more fatalities from earthquakes in countries with greater inequality and smaller per capita income. Accounting for such factors ensures that the inclusion of the number of casualties and the number of people affected by the disaster are a measure of the magnitude of the disaster rather than other factors.

[18] http://tvnews.vanderbilt.edu/
[19] CNN is available starting in 1995 while Fox News is included since 2004.

In addition, they help ensure that the corruption indicator is not picking up other institutional factors or the level of development in a country, which could drive the results.

As a result, I include additional indicators to control for factors that may affect the likelihood of response and the amount of disaster relief given. These controls are the log of per capita income, the log of population, the level of democracy, an indicator for whether the country is a member of the UN Security Council in a given year, and, in the case of regressions explaining U.S. disaster assistance, a presidential election year dummy.

The log of per capita income (in constant 2000 dollars using the Laspeyres weighting) is taken from the Penn World Tables, while the log of population was obtained from the World Bank's World Development Indicators. Poorer countries are expected to receive more aid (Alesina and Dollar, 2002), whereas larger countries are predicted to receive less aid. The latter is because in a large country the disaster would only affect a portion of the country, whereas in a small country it could potentially impact the entire country.

The level of democracy in the recipient country is measured using the Polity 2 indicator, which is taken from the Polity IV database, and is currently available up to 2004.[20] The variable Polity 2 is a measure of the quality of democratic institutions, and varies from +10 (strongly democratic) to -10 (strongly autocratic).[21] As mentioned previously, democracies experience fewer casualties from disasters and hence are likely to receive less aid. On the other hand, foreign development aid has been found to be positively correlated with a recipient country's

[20] See http://www.cidcm.umd.edu/inscr/polity/index.htm.

[21] I also experimented with using the political rights rating from the Freedom House Freedom in the World country ratings. That index ranks countries each year in seven categories, such as the existence of fair electoral laws, equal campaigning opportunities, and whether there is a significant opposition vote. The index varies from 1 (free) to 7 (not free), and is available from 1972 to 2007. See http://www.freedomhouse.org/. The results are not affected by this choice.

democratic level. This suggests that disaster relief may be more likely to be allocated the more democratic the affected country is.

To examine whether UN Security Council membership matters in disaster relief allocation, as Kuziemko and Werker (2006) find when examining foreign development aid, I also include an index that equals 1 if the country is a member of the Security Council in a given year and zero otherwise.[22]

Finally, I include, in the case of regressions examining U.S. disaster response and relief, an indicator that equals 1 for election years and zero otherwise. This is because presidential election-year politics may matter in determining disaster relief allocations.[23]

3. Empirical Specification

This section presents the empirical estimation strategy. The first step is to estimate the effect of corruption on the likelihood that a country will receive assistance following a disaster. Next, I examine the impact of corruption on the amount of disaster relief allocated. Then, I take the possible endogeneity of corruption into account by using instrumental variables. Finally, I explore whether the effect of corruption on aid differs depending on the type of disaster.

3.1. Disaster Response

To analyze the effect of corruption on disaster response, I estimate the following equation:[24]

$$response_{imt} = \beta_1 corrupt_{it} + \beta_2 X_{imt} + \beta_3 \Omega_{it} + \beta_4 Z_{imt} + \beta_5 \Phi_i + \nu_m + \sigma_t + \varepsilon_{imt} \quad (1)$$

[22] Data were taken from http://www.un.org/sc/list_eng5.asp.
[23] Garrett and Sobel (2003), in their analysis of FEMA disaster payments, find an election year effect in disaster expenditures.
[24] The equation is estimated using a linear probability OLS model as well as a Probit.

where $response_{imt}$ is a dummy that takes a value of 1 if country i received disaster relief in month m and year t; $corrupt_{it}$ is the corruption indicator; X_{imt} is a vector of country-month-year-specific control variables (which include the news coverage dummy, as well as the log of the number of fatalities and the log affected); Ω_{it} is a vector of country-year-specific controls (including the log of population, log of GDP per capita, and the democracy indicator); Z_{imt} is a set of disaster dummies (for earthquakes, volcanoes, floods, storms, extreme temperature, and slides, with wild fires as the omitted category); Φ_i is country-specific dummy;[25] v_m is a month-specific fixed effect; σ_t is a year-specific fixed effect; and ε_{imt} is a heteroskedasticity consistent error term, clustered at the recipient country level. Country dummies capture any omitted factors that are constant across time, including an affected country's distance from a donor country. In addition, any changes in the average level of disaster relief across time will be captured by the year fixed effects, while the monthly dummies captures budget cycle effects. This is important because a disaster may receive less attention and hence less aid because it takes place at the end of a donor nation's budget cycle, as was the case with the Pakistan earthquake in October of 2005, which killed 73,000 people and yet the following month donor countries had only pledged about a quarter of the amount of money the UN declared was needed to provide relief. In contrast, the Indian Ocean tsunami of 2004, which took place at the beginning of the 2005 budget cycle, killed 200,000 people. A month after this disaster, donor countries had pledged 99 percent of the amount needed.[26]

[25] I also experiment with region dummies defined in the CRED EM-DAT (for Australia and New Zealand, Caribbean, Central America, Central Asia, Eastern Africa, Eastern Asia, Eastern Europe, Melanesia, Micronesia, Middle Africa, Middle East, Northern Africa, Northern America, Northern Europe, Polynesia, South America, South-Eastern Asia, Southern Africa, Southern Asia, Southern Europe, Western Africa, Western Asia, and Western Europe). The conclusions are unchanged.

[26] Somini Sengupta and David Rohde. "When One Tragedy Gets More Sympathy than Another." *New York Times*, 14 November 2005.

When examining the impact of corruption on disaster relief disbursements, the equation estimated is:

$$\ln\left(1+relief_{imt}\right)=\beta_1 corrupt_{it}+\beta_2 \mathrm{X}_{imt}+\beta_3 \Omega_{it}+\beta_4 \mathrm{Z}_{imt}+\beta_5 \Phi_i+\nu_m+\sigma_t+\varepsilon_{imt} \qquad (2)$$

where $\ln\left(1+relief_{imt}\right)$ is the log of disaster assistance given by the U.S. or the international community to country *i* received in month *m* and year *t* and the other variables are as defined above. The equation is estimated using OLS; however, given that less than 15 percent of disasters received aid (see Table 2), I also experiment using a Tobit.

3.2. IV Estimation

A possible concern that may be raised is that even after including the full set of control variables, corruption may still be endogenous to relief. Escaleras et al. (2007) find that the higher public sector corruption is, the greater the number of earthquake deaths. This suggests that if relief is greater the higher the number of fatalities, the higher should be both the likelihood of assistance and the amount of aid. Although I take fatalities into account in the regressions, as well as the level of democracy and development, and experiment with including the previous 3-year average of the number of disasters in the country, it could still be that disaster relief is affecting corruption. Alesina and Weder (2002), for instance, find some evidence that foreign aid may increase corruption. Similarly, Leeson and Sobel (forthcoming) find that increases in annual FEMA relief result in increases in corruption.

In addition, aggregated corruption perception indices like the Transparency International's CPI and the Kaufman et al. (2007) control of corruption indicator are measured with error due to different reliability in the component surveys, which creates an attenuation bias.[27] To address both the endogeneity and the measurement error problem, I estimate a two-stage least squares (2SLS) version of equations 1 and 2.[28] To be valid, instruments are needed that are correlated with corruption but uncorrelated with disaster relief or aid, excluding the effect of corruption.

As mentioned before, since the concern here is to estimate the impact of corruption perceptions on aid, rather than the actual level of corruption, I select instruments that have been shown in the literature to explain corruption perceptions. In particular, previous studies have found that countries with higher ethnolinguistic fractionalization are perceived to be more corrupt, while those with British legal origin and a large share of Protestants are regarded as less corrupt (see Treisman, 2000; Lambsdorff, 2006; and Paldam, 2001, for instance). As a result, the instruments I use are a legal origin indicator (British, French, Socialist, German, or Scandinavian) and the share of Protestants in a country, both taken from La Porta et al. (1999); in addition to three measures of fractionalization obtained from Alesina et al. (2003): ethnic, religious, and language. All of these measures can be assumed to be uncorrelated with disaster relief and aid, except for the effect of corruption.[29] They are also unlikely to be correlated with the measurement error associated with the corruption perception indices. Since all of these indicators are time-invariant, I interact each of them with the year dummies.

[27] Both indices are published with the standard errors associated with each measure. Neither the ICRG index nor the Heritage Foundation index include standard errors.
[28] As shown in Greene (2008), instrumental variable estimation can be used to account for measurement error.
[29] In all cases, the F-statistic on the excluded instruments from the first stage regression is significant. In addition, the partial R-squared (obtained by netting out any common variables from a regression of the endogenous variables on the instruments) is around 0.3.

3.3. Corruption by Disaster Type

The effect of corruption on relief may also vary by disaster type. For example, an earthquake has a different impact than a heat wave, since earthquakes tend to destroy infrastructure, whereas heat waves are more likely to affect the agricultural sector. Following a major earthquake, buildings and roads often need to be rebuilt, especially in countries where, due to high corruption, the infrastructure was built without regard as to whether it can survive earthquakes (Escaleras et al., 2007). In the case of countries that are very dependent on agriculture, prolonged heat waves, which could result in famines, are likely to increase unrest in a country and make them seem more risky to a donor. Clearly, the types of corruption that arises in each case are different.

To test this hypothesis, I estimate the following equation:

$$response_{imt} = \beta_1 corrupt_{it} * \mathrm{Z}_{imt} + \beta_2 \mathrm{X}_{imt} + \mu_i + \nu_m + \sigma_t + \varepsilon_{imt} \qquad (3)$$

where $response_{imt}$ is the disaster response dummy; $corrupt_{it} * \mathrm{Z}_{imt}$ is an interaction term between the corruption indicator and each disaster dummy; μ_i is a country-specific fixed effect;[30] and the remaining variables are as defined in section 3.1. The coefficient on the interaction term, then, measures the impact of corruption for each disaster type.

To estimate the impact of corruption perceptions on disaster relief allocation, I estimate the equation

$$\ln(1 + relief)_{imt} = \beta_1 corrupt_{it} * \mathrm{Z}_{imt} + \beta_2 \mathrm{X}_{imt} + \mu_i + \nu_m + \sigma_t + \varepsilon_{imt} \qquad (4)$$

where $\ln(1 + relief)_{imt}$ is the log of U.S. or international disaster relief and the remaining variables are as described above.

[30] I also experiment with including the regional dummies instead of country dummies. The results are not affected.

4. Results

This section discusses the results of the empirical analysis. Table 3 presents the results examining the effect of corruption on U.S. disaster response, while Table 4 explores the effect of corruption on the amount of U.S. disaster relief. Tables 5 and 6 check whether the results hold for international disaster response and relief, respectively, while Tables 7 and 8 tests whether these results are robust to disaggregating the data to the donor level or excluding non-governmental organization and private donations. Tables 9 and 10 check whether the results hold for each sample after instrumenting for corruption, while Tables 11 and 12 estimate the effect of corruption by disaster type. Finally, Table 13 examines whether the type of disaster affects corruption. Additional robustness tests are presented in the Appendix.

4.1. United States Relief Response

According to Table 3, a higher corruption risk reduces the probability that an affected country will get disaster relief. In particular, a one standard deviation increase in the ICRG index[31] lowers the response probability by about 2 percent. The same is true for the Heritage Foundation index. The Transparency International and Kaufmann et al. (2007) indices, however, are insignificant, suggesting that it is the risk to investors from corruption, rather than corruption perception per se, that affects disaster response by the U.S. The level of democracy does not seem to affect the likelihood of response. However, as expected, news coverage of the disaster, as well as being an election year, have a positive impact on the response probability. Similarly, higher casualties and a higher number of individuals affected by the disaster increase the likelihood of response. Richer countries as well as smaller countries are found to be less likely to receive aid.

[31] This is equivalent to close to 2 points on the rescaled ICRG indicator.

One concern that could be raised regarding the results on disaster responsiveness is the estimation method. Table 3 uses a linear probability OLS model, but to check the robustness of the results, in columns 1-4 of Appendix Table 1, I also estimate the model using a Probit. Once again, it is found that the ICRG index has a negative relationship to U.S. disaster response, while the other corruption perception indices are insignificant.

4.2. United States Disaster Aid

Table 4 suggests that increases in the ICRG and Heritage Foundation indices are also correlated with lower amounts of disaster relief. In particular, a one point increase in the ICRG or the Heritage Foundation index seem to decrease aid by about 12 and 2 percent, respectively, while both the Transparency International and the Kaufmann et al. (2007) control of corruption indices are insignificant.

As in the case of disaster response, more aid is given in a presidential election year. Similarly, the higher the number of people affected or killed, as well as news coverage are all positively associated with disaster aid. However, the log of GDP per capita, and the log of population are negatively correlated with relief, suggesting that poorer and larger countries receive more aid. In addition, there is some evidence that countries that are members of the Security Council at the time of the disaster receives more aid, though this result is not robust across all specifications. As before, neither democracy nor the frequency of disasters are correlated with the amount of aid given to an affected country.

Given that less than 15 percent of disasters received relief, I also experimented with a Tobit model. The results, shown in Appendix Table 2, show that the conclusions are not affected by the estimation method. These results then suggest that countries with higher risk from corruption actually receive less disaster relief from the United States.

A further concern that could be raised regards the treatment of cases where there was no disaster response. Because disaster relief amounts are not observed when there was no disaster response, I assigned a zero to those cases. In columns 1-4 of Appendix Table 3, I test whether dropping those observations changes the results. Here I find that corruption, regardless of how it is measured, is always insignificant in explaining the amount of disaster aid once the U.S. has decided to provide aid.

4.3. International Relief Response

To test whether the results regarding U.S. disaster aid hold for international disaster relief, as reported to the OCHA, Table 5 explores the effect of the different corruption indicators on disaster response.

The results here are different from what was found when examining U.S. disaster response. In particular, while corruption is still negatively correlated with the probability of response, the effect is insignificant in all cases, suggesting that international disaster response is unaffected by the recipient country's corruption level or even risk from corruption.

The remaining findings are similar to the determinants of U.S. disaster response. In particular, the log of the number affected and killed, as well as news coverage, raise the probability of response. The log of GDP per capita and the log of population, however, are now found to be insignificant.

To check whether these results are sensitive to the estimation method, in columns 5-8 of Appendix Table 1, I use a Probit instead to estimate the model. Once again, it is found that corruption, regardless of how it is measured, is insignificant in explaining international disaster response.

4.4. International Disaster Aid

Table 6 explores the relationship between corruption and the amount of international disaster relief. The results are similar to those found when exploring international disaster responsiveness. In particular, corruption, regardless of how it is measured, is found to have an insignificant relationship to aid. As before, however, disaster relief is seen to have a positive correlation to the log of the number affected and of casualties, as well as news coverage, and a negative correlation to the log of GDP per capita, although the latter result is not robust across all specifications. These results then suggest that the determinants of international disaster assistance are similar to those of U.S. disaster relief. However, while the risk associated with corruption has a negative and significant relationship to the U.S. response, it is insignificant in explaining international response.[32]

This result, though, could be due to the fact that the figures include disaster assistance given by donor countries at different levels of corruption and democracy. More corrupt or less democratic countries may be more likely to provide aid to similarly corrupt countries than those that have less corruption. To investigate this possibility, Tables 7 and 8 estimates the relationship between corruption and international disaster response and relief, respectively, by donor country, excluding the U.S. I also experiment with excluding the U.S., non-governmental organizations and private donations from the aggregate measure. In the first case, it is seen that neither the recipient country nor the donor country's corruption level affects disaster aid. In the second case,

[32] I was unable to estimate the relationship between corruption and international relief using a Tobit specification because the regressions would not converge.

it seems that corruption only affects international response and relief when it is measured using the Heritage Foundation index.[33]

As a further robustness check, in columns 5-8 of Appendix Table 3, I test whether dropping the cases where there was no disaster response changes the results. Once again I find that corruption, regardless of how it is measured, is always insignificant in explaining the amount of disaster relief.

4.5. Instrumenting Corruption

As mentioned previously, there could be a concern about the endogeneity of corruption. In particular, it is possible that countries that receive more disaster assistance become more corrupt. Leeson and Sobel (forthcoming), for instance, find that higher FEMA payments to an affected state increase corruption. Furthermore, corruption perception indices are measured with error, especially those that consist of an aggregate of various different surveys with varying reliability, which would tend to bias the coefficient towards zero. To address the endogeneity issue, I experiment with including the log of disaster frequency as a control variable in the previous regressions. To further check the endogeneity problem, as well as to account for the measurement error, Tables 9 and 10 instrument the various corruption indices using the interaction between the year dummies and a legal origin indicator, the share of protestants in the country, and three different measures of fractionalization, namely, ethnic, religious, and language fractionalization.

[33] In additional regressions, I examined the relationship between corruption and disaster response and relief from the United Kingdom, Canada, Switzerland, Japan, France, Norway, Sweden, France and Turkey. These countries were selected for having donated to a large number of disasters. In all cases except Turkey, corruption is found to be insignificant in explaining both disaster response and disaster relief allocation. However, the results suggest that Turkey is more likely to provide relief to countries with higher perceived risk from corruption.

The results are found to be very similar to the previous ones. More specifically, corruption as measured by the ICRG index has a negative and significant correlation to U.S. disaster response. The effect of the risk from corruption on the amount of U.S. disaster relief, however, is now found to be insignificant. Furthermore, the Transparency International index, as well as the Kaufmann et al. (2007) and the Heritage Foundation indices are all insignificant in explaining U.S. disaster response or relief. The effect of corruption on international response and relief are similarly insignificant. These results then suggest that the political risk associated with corruption, which is what is measured by the ICRG index, does have a negative impact on U.S. disaster responsiveness. This means that just as investors have been found to be averse to corrupt countries when considering FDI, so are donor agencies.

Finally, the results show that the above findings on the determinants of relief are still supported. More specifically, both disaster responsiveness and disaster relief are positively correlated to news coverage and the severity of the disaster as measured by the log of the number of people affected and log of the number of people killed. There is also some suggestion that the log of population and the log of GDP per capita are negatively related to both response and relief, though the result is not robust to all specifications.

Appendix Tables 4 and 5 provide further robustness checks by employing a Probit and a Tobit in the second stage of the estimation, respectively. The results are robust to the estimation method. In particular, the risk associated with corruption, as measured by the ICRG index, is negatively correlated with both U.S. disaster response and relief. The other indicators are insignificant.

Overall, there is strong evidence suggesting that corruption levels affect disaster relief, or at least the political risk associated with corruption in the affected country. The next section will then examine whether this effect varies with disaster type.

4.6. Corruption by Disaster Type

Tables 11 and 12 show the results of estimating the impact of corruption by disaster type. Table 11 looks at the likelihood that disaster relief is provided, while Table 12 examines the amount of relief.[34] The results do in fact suggest a differential effect of corruption depending on the type of disaster. More specifically, it is seen that higher corruption lowers the response likelihood and the amount of aid provided in the cases of landslides, extreme temperature, and floods and storms. Furthermore, in the case of earthquakes, higher corruption reduces the probability of aid and the amount of relief provided by the U.S., but is insignificant in explaining international relief allocation. The effect of corruption in the case of volcanoes is insignificant in all cases. Finally, news coverage and a higher number of fatalities and affected people are still found to increase both the likelihood as well as the amount of aid, while the log of real GDP per capita has a negative impact on response and aid. The level of democracy, along with membership in the UN Security Council and the log of population are all found to be insignificant.

The question may also arise as to whether countries that suffer a particular disaster are more corrupt than those that are prone to other types. Table 2 shows average corruption levels by type of disaster, suggesting that corruption varies from about 5 to 7 in the 10-point scale (or 50 to 70 in the 100 point scale of the Heritage Foundation index). To further examine this, Table 13

[34] In additional regressions available upon request, I experimented with estimating these models with a Probit (for disaster response) and a Tobit (for disaster aid). The conclusions are unchanged.

presents the results of a regression of disaster type on each corruption index. The results suggest that the type of disaster has no significant impact on the level of corruption in a country.

5. Conclusion

The effectiveness of disaster relief may depend on the corruption level in the affected country, and this risk could potentially make donor countries think twice before providing sufficient assistance to help the victims. There is evidence that earthquake casualties, overall foreign development aid, and FDI do respond to corruption. However, the literature has yet to explore the link between corruption in the recipient country and disaster assistance allocation. This paper then examines whether corruption has an impact on the likelihood of response to a natural disaster and the amount of disaster relief provided by both the U.S. and the international community.

The relationship between corruption and disaster response and relief by both the U.S. and the international community is tested using four different indices of corruption, including one that specifically measures the risk of corruption to potential investors. Several control variables are included to ensure that any observed correlation is not due to omitted factors. Furthermore, instrumental variable estimation is undertaken to control for the possible endogeneity of corruption, as well as measurement error in the indices.

The results suggest that a higher risk from corruption lowers the likelihood of U.S. response. There is also some evidence that it may lower the amount of U.S. disaster relief. The relationship between international relief and corruption, however, is found to be insignificant, even when the donor countries' corruption and democracy levels are taken into account. Finally, the effect of corruption is found to differ depending on the type of disaster.

These results then show that although natural disasters are obviously exogenous events with serious humanitarian consequences, the perceived risk from corruption in the affected country matters in U.S. disaster response, but not in assistance from other donor countries. As mentioned in the introduction, the Office of U.S. Foreign Disaster Assistance specifies that one of the conditions for providing relief is that it be in the interest of the U.S. government. However, further research is needed to uncover the reasons for this difference.

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Table 1: Summary Statistics

Panel A: OFDA Sample

	N	Mean	Std Dev	Min	Max
Aid	2555	64840.220	731554.2	0	2.36E+07
Log Aid	2555	1.216	3.562	0	16.976
ICRG Index	2555	5.422	1.961	0	10
TI Index	1805	6.142	1.981	0	9.6
Kaufmann	1460	5.278	1.795	0.213	8.855
Heritage	2254	64.159	21.031	4	96
Polity 2	2555	4.423	6.171	-10	10
Killed	2555	197.013	3498.691	0	165708
Affected	2555	776325.3	8301356	0	2.39E+08
Log Killed	2555	2.205	1.906	0	12.018
Log Affected	2555	7.066	4.481	0	19.292
News Coverage	2555	0.086	0.280	0	1
Log GDP Per Capita	2555	8.528	0.952	5.139	10.426
Log Population	2555	17.861	1.654	13.386	20.986
Security Council	2555	0.231	0.422	0	1
Election Year	2552	0.247	0.431	0	1
Disaster Frequency	2552	5.615	5.577	0	26
Log Frequency	2552	1.593	0.757	0	3.296

Panel B: OCHA Sample

	N	Mean	Std Dev	Min	Max
Aid	2668	1110870	17400000	0	7.45E+08
Log Aid	2668	1.732	4.585	0	20.429
ICRG Index	2668	5.364	1.986	0	10
TI Index	1802	6.141	1.982	0	9.6
Kaufmann	1454	5.275	1.796	0.213	8.855
Heritage	2247	64.079	21.014	4	96
Polity 2	2668	4.430	6.179	-10	10
Killed	2668	191.272	3424.087	0	165708
Affected	2668	753998.4	8129357	0	2.39E+08
Log Killed	2668	2.209	1.911	0	12.018
Log Affected	2668	7.041	4.497	0	19.292
News Coverage	2668	0.082	0.275	0	1
Log GDP Per Capita	2668	8.524	0.948	5.139	10.426
Log Population	2668	17.880	1.658	13.386	20.986
Security Council	2668	0.235	0.424	0	1
Disaster Frequency	2664	5.623	5.544	0	26
Log Frequency	2664	1.596	0.757	0	3.296

Note: OFDA sample denotes the 1993-2004 period for which data are available from the Office of U.S. Foreign Disaster Assistance. OCHA sample is the 1992-2004 period encompassing aid figures from the UN Office for the Coordination of Humanitarian Affairs.

Table 2: Summary Statistics by Disaster

Panel A: OFDA Sample

	Number	Killed	Affected	Share receiving OFDA relief	mean ICRG	mean TI	mean Kaufmann	mean Heritage
Volcano	59	459	1080194	0.152	5.466	7.041	5.936	68.778
					(2.053)	(1.278)	(1.639)	(13.998)
Earthquake	322	105584	3.82E+07	0.165	5.596	6.543	5.832	69.267
					(1.877)	(1.393)	(1.466)	(16.933)
Flood	1313	103960	1.69E+09	0.148	5.593	6.233	5.513	65.259
					(1.941)	(1.924)	(1.845)	(21.035)
Wild Fire	128	475	3469059	0.094	4.805	5.447	4.922	55.532
					(2.353)	(2.359)	(2.001)	(24.469)
Storm	900	296196	3.44E+08	0.103	5.198	5.717	4.908	60.270
					(2.042)	(2.196)	(1.917)	(22.745)
Slides	222	10583	2.83E+06	0.063	5.748	6.803	5.892	69.322
					(1.911)	(1.494)	(1.326)	(17.278)
Temperature	165	86875	1.03E+07	0.012	5.335	6.126	5.011	61.710
					(1.847)	(1.999)	(1.777)	(20.047)
Total	3109	604132	2089878642	0.122				

Panel B: OCHA Sample

	Number	Killed	Affected	Share receiving OCHA relief	mean ICRG	mean TI	mean Kaufmann	mean Heritage
Volcano	64	459	1131054	0.234	5.355	7.041	5.936	68.778
					(2.090)	(1.278)	(1.639)	(13.998)
Earthquake	344	109616	3.89E+07	0.224	5.515	6.543	5.832	69.267
					(1.948)	(1.393)	(1.466)	(16.933)
Flood	1371	109458	1.71E+09	0.174	5.560	6.233	5.513	65.259
					(1.939)	(1.924)	(1.845)	(21.035)
Wild Fire	133	597	3520259	0.068	4.704	5.447	4.922	55.532
					(2.389)	(2.359)	(2.001)	(24.469)
Storm	947	297439	3.57E+08	0.127	5.129	5.717	4.908	60.270
					(2.086)	(2.196)	(1.917)	(22.745)
Slides	232	11363	2870268	0.052	5.707	6.803	5.892	69.322
					(1.913)	(1.494)	(1.326)	(17.278)
Temperature	172	87263	1.04E+07	0.017	5.279	6.126	5.011	61.710
					(1.889)	(1.999)	(1.777)	(20.047)
Total	3263	616195	2123821581	0.145				

Note: OFDA sample denotes the 1993-2004 period for which data are available from the Office of U.S. Foreign Disaster Assistance. OCHA sample is the 1992-2004 period encompassing aid figures from the UN Office for the Coordination of Humanitarian Affairs.

Table 3: Effect of Corruption on U.S. Responsiveness to Disaster

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ICRG Index	-0.012**	-0.012**						
	(0.006)	(0.006)						
TI Index			0.014	0.016				
			(0.020)	(0.019)				
Kaufmann Index					0.024	0.012		
					(0.037)	(0.036)		
Heritage Index							-0.001*	-0.001*
							(0.001)	(0.001)
Election Year		0.142***		0.067**		0.021		0.087**
		(0.047)		(0.031)		(0.020)		(0.037)
Disaster Frequency		0.012		-0.011		0.009		0.011
		(0.029)		(0.042)		(0.047)		(0.035)
Polity 2	0.002	0.002	0.002	0.002	-0.006	-0.004	-0.002	-0.001
	(0.004)	(0.004)	(0.003)	(0.003)	(0.005)	(0.004)	(0.003)	(0.003)
Log Affected	0.020***	0.020***	0.020***	0.020***	0.022***	0.022***	0.021***	0.021***
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)
Log Killed	0.058***	0.058***	0.060***	0.061***	0.061***	0.062***	0.058***	0.059***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)
News Coverage	0.067***	0.067***	0.063**	0.063**	0.058	0.061	0.056**	0.059**
	(0.025)	(0.025)	(0.027)	(0.027)	(0.038)	(0.038)	(0.027)	(0.027)
Log GDP per Capita	0.006	0.003	-0.245**	-0.244**	-0.298***	-0.292***	-0.135*	-0.144*
	(0.050)	(0.050)	(0.104)	(0.105)	(0.096)	(0.094)	(0.077)	(0.075)
Log Population	-0.729***	-0.732***	-0.280	-0.317	-0.656	-0.736*	-0.634*	-0.725**
	(0.238)	(0.238)	(0.295)	(0.290)	(0.418)	(0.417)	(0.326)	(0.325)
Security Council	0.037**	0.037**	0.018	0.017	0.021	0.015	0.030	0.032
	(0.018)	(0.018)	(0.020)	(0.021)	(0.028)	(0.028)	(0.021)	(0.021)
Observations	2555	2552	1805	1803	1460	1457	2254	2249
Adj. Within R-Squared	0.2453	0.2454	0.2570	0.2576	0.2469	0.2498	0.2458	0.2464

Note: Linear Probability OLS regressions. Dependent variable equals 1 if relief was provided (OFDA). Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects.

Table 4: Effect of Corruption on U.S. Disaster Relief

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ICRG Index	-0.119**	-0.118*						
	(0.060)	(0.060)						
TI Index			0.218	0.247				
			(0.209)	(0.200)				
Kaufmann Index					0.272	0.140		
					(0.406)	(0.398)		
Heritage Index							-0.017*	-0.019**
							(0.009)	(0.009)
Election Year		1.434***		0.692**		0.241		0.912**
		(0.478)		(0.349)		(0.225)		(0.410)
Disaster Frequency		0.275		-0.091		0.317		0.321
		(0.308)		(0.439)		(0.494)		(0.363)
Polity 2	0.025	0.023	0.020	0.018	-0.061	-0.038	-0.016	-0.007
	(0.047)	(0.048)	(0.040)	(0.040)	(0.058)	(0.050)	(0.039)	(0.037)
Log Affected	0.232***	0.231***	0.224***	0.223***	0.243***	0.242***	0.240***	0.238***
	(0.029)	(0.029)	(0.024)	(0.024)	(0.028)	(0.028)	(0.025)	(0.024)
Log Killed	0.730***	0.732***	0.772***	0.775***	0.773***	0.781***	0.741***	0.742***
	(0.054)	(0.054)	(0.066)	(0.066)	(0.072)	(0.072)	(0.059)	(0.059)
News Coverage	0.957***	0.958***	0.947***	0.942***	0.884*	0.926**	0.868***	0.902***
	(0.299)	(0.300)	(0.312)	(0.314)	(0.455)	(0.455)	(0.321)	(0.320)
Log GDP per Capita	0.237	0.182	-2.187*	-2.201*	-2.502**	-2.508**	-0.920	-1.092
	(0.553)	(0.551)	(1.144)	(1.151)	(0.981)	(1.008)	(0.749)	(0.753)
Log Population	-6.899***	-6.847***	-3.188	-3.659	-6.172	-6.794	-5.598	-6.582*
	(2.560)	(2.510)	(3.492)	(3.395)	(4.617)	(4.538)	(3.509)	(3.430)
Security Council	0.426**	0.432**	0.227	0.226	0.247	0.220	0.342	0.375
	(0.208)	(0.204)	(0.228)	(0.234)	(0.301)	(0.305)	(0.235)	(0.231)
Observations	2555	2552	1805	1803	1460	1457	2254	2249
Adj. Within R-Squared	0.2699	0.2702	0.2887	0.2894	0.2670	0.2704	0.2721	0.2731

Note: OLS regressions. Dependent variable is the log of OFDA Aid. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects.

Table 5: Effect of Corruption on International Responsiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ICRG Index	-0.000	-0.000						
	(0.007)	(0.006)						
TI Index			-0.003	-0.001				
			(0.014)	(0.014)				
Kaufmann Index					-0.036	-0.049		
					(0.033)	(0.031)		
Heritage Index							-0.001	-0.001
							(0.001)	(0.001)
Disaster Frequency		-0.004		-0.001		0.041		0.021
		(0.023)		(0.036)		(0.034)		(0.028)
Polity 2	0.001	0.001	0.003	0.003	0.003	0.005*	-0.002	-0.001
	(0.003)	(0.003)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)
Log Affected	0.022***	0.022***	0.020***	0.019***	0.019***	0.019***	0.021***	0.021***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Log Killed	0.056***	0.057***	0.051***	0.051***	0.048***	0.049***	0.056***	0.056***
	(0.006)	(0.006)	(0.007)	(0.007)	(0.009)	(0.009)	(0.006)	(0.006)
News Coverage	0.102***	0.101***	0.060**	0.060**	0.078*	0.082*	0.090***	0.092***
	(0.026)	(0.026)	(0.029)	(0.029)	(0.043)	(0.044)	(0.031)	(0.031)
Log GDP per Capita	0.079	0.077	-0.138	-0.140	-0.173	-0.179	-0.073	-0.082
	(0.059)	(0.059)	(0.117)	(0.118)	(0.109)	(0.113)	(0.070)	(0.072)
Log Population	-0.189	-0.198	0.550	0.527	0.243	0.175	-0.286	-0.363
	(0.245)	(0.249)	(0.434)	(0.432)	(0.440)	(0.438)	(0.318)	(0.324)
Security Council	0.011	0.011	-0.005	-0.005	0.008	0.005	0.009	0.013
	(0.026)	(0.026)	(0.031)	(0.031)	(0.037)	(0.037)	(0.030)	(0.029)
Observations	2682	2678	1805	1803	1460	1457	2254	2249
Adj. Within R-Squared	0.2450	0.2446	0.2172	0.2168	0.1966	0.1988	0.2343	0.2342

Note: Linear Probability OLS regressions. Dependent variable equals 1 if relief was provided (as reported to OCHA). Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects.

Table 6: Effect of Corruption on International Disaster Aid

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ICRG Index	0.013	0.015						
	(0.085)	(0.086)						
TI Index			-0.051	-0.020				
			(0.193)	(0.190)				
Kaufmann Index					-0.374	-0.527		
					(0.459)	(0.445)		
Heritage Index							-0.018	-0.019
							(0.012)	(0.012)
Disaster Frequency		-0.029		0.086		0.562		0.343
		(0.312)		(0.477)		(0.458)		(0.370)
Polity 2	0.022	0.022	0.036	0.035	0.040	0.064	-0.024	-0.009
	(0.042)	(0.042)	(0.069)	(0.069)	(0.048)	(0.040)	(0.042)	(0.043)
Log Affected	0.299***	0.298***	0.267***	0.266***	0.256***	0.255***	0.284***	0.281***
	(0.042)	(0.042)	(0.040)	(0.040)	(0.042)	(0.042)	(0.040)	(0.040)
Log Killed	0.842***	0.844***	0.753***	0.756***	0.709***	0.717***	0.829***	0.829***
	(0.086)	(0.086)	(0.109)	(0.110)	(0.132)	(0.132)	(0.089)	(0.089)
News Coverage	1.343***	1.339***	0.907**	0.903**	0.810*	0.863*	1.086***	1.113***
	(0.326)	(0.326)	(0.361)	(0.361)	(0.463)	(0.465)	(0.351)	(0.351)
Log GDP per Capita	0.506	0.482	-2.195	-2.291	-3.065**	-3.151**	-1.095	-1.257
	(0.723)	(0.724)	(1.585)	(1.607)	(1.430)	(1.504)	(0.914)	(0.938)
Log Population	-3.751	-3.916	7.577	7.139	1.374	0.772	-2.747	-3.760
	(3.023)	(3.058)	(5.846)	(5.807)	(6.004)	(5.996)	(4.244)	(4.293)
Security Council	0.071	0.076	-0.100	-0.089	0.030	0.017	-0.010	0.034
	(0.332)	(0.332)	(0.404)	(0.408)	(0.481)	(0.482)	(0.392)	(0.388)
Observations	2668	2664	1802	1800	1454	1451	2247	2242
Adj. Within R-Squared	0.2671	0.2667	0.2352	0.2347	0.2070	0.2089	0.2554	0.2551

Note: OLS regressions. Dependent variable is the log of OCHA Aid. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects.

Table 7: Effect of Corruption by on International Responsiveness—By Donor, Public Donations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ICRG Index	-0.000				0.015			
	(0.001)				(0.010)			
ICRG Index Donor	0.000							
	(0.000)							
TI Index		0.001				-0.015		
		(0.001)				(0.011)		
TI Index Donor		-0.000						
		(0.000)						
Kaufmann Index			0.005				0.082	
			(0.004)				(0.050)	
Kaufmann Index Donor			0.000					
			(0.001)					
Heritage Index				0.000				-0.004*
				(0.000)				(0.002)
Heritage Index Donor				-0.000				
				(0.000)				
Polity 2	0.003	0.003	0.000	-0.000	0.003	0.008	0.022**	-0.003
	(0.002)	(0.002)	(0.002)	(0.001)	(0.014)	(0.015)	(0.011)	(0.009)
Polity 2 Donor	-0.000	-0.000	-0.000	-0.000				
	(0.000)	(0.000)	(0.000)	(0.000)				
Log Affected	0.001***	0.001***	0.001***	0.001***	0.020***	0.019***	0.020***	0.020***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.003)	(0.003)	(0.003)
Log Killed	0.006***	0.006***	0.005***	0.006***	0.055***	0.052***	0.060***	0.056***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.006)	(0.006)	(0.008)	(0.006)
News Coverage	0.009	0.010	0.004	0.008	0.009	0.018	-0.003	0.002
	(0.007)	(0.006)	(0.006)	(0.006)	(0.035)	(0.036)	(0.031)	(0.035)
Log GDP per Capita	-0.034	-0.033	-0.047*	-0.035	-0.047	-0.105	-0.306**	-0.072
	(0.026)	(0.033)	(0.026)	(0.028)	(0.183)	(0.184)	(0.139)	(0.166)
Log Population	-0.072	-0.100	-0.112	-0.131	0.834	1.062	0.957	0.616
	(0.085)	(0.112)	(0.093)	(0.094)	(0.624)	(0.655)	(0.645)	(0.576)
Security Council	0.000	0.000	0.000	0.001	-0.012	-0.031	0.002	-0.009
	(0.001)	(0.002)	(0.001)	(0.002)	(0.022)	(0.024)	(0.029)	(0.021)
Observations	117219	108405	109191	126378	1335	1266	1099	1351
Adj. Within R-Squared	0.1388	0.1394	0.1235	0.1377	0.2449	0.2446	0.2533	0.2433

Note: Linear probability OLS regressions. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. Columns 1-4 include donor country, recipient region, year, month, and disaster-type fixed effects. Columns 5-8 include recipient country, year, month and disaster-type fixed effects.

Table 8: Effect of Corruption by on International Relief—By Donor, Public Donations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ICRG Index	-0.005				0.149			
	(0.012)				(0.135)			
ICRG Index Donor	0.001							
	(0.004)							
TI Index		0.011				-0.209		
		(0.010)						
TI Index Donor		-0.002						
		(0.004)				(0.154)		
Kaufmann Index			0.049				1.071	
			(0.042)				(0.675)	
Kaufmann Index Donor			0.002					
			(0.009)					
Heritage Index				0.001				-0.053*
				(0.003)				(0.028)
Heritage Index Donor				-0.000				
				(0.000)				
Polity 2	0.036	0.036	0.005	-0.000	0.104	0.159	0.300**	-0.011
	(0.027)	(0.025)	(0.022)	(0.018)	(0.201)	(0.208)	(0.140)	(0.122)
Polity 2 Donor	-0.000	-0.002	-0.001	-0.000				
	(0.002)	(0.001)	(0.001)	(0.001)				
Log Affected	0.013***	0.012***	0.012***	0.013***	0.271***	0.252***	0.263***	0.262***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.036)	(0.034)	(0.037)	(0.035)
Log Killed	0.077***	0.073***	0.064***	0.069***	0.788***	0.749***	0.839***	0.794***
	(0.016)	(0.017)	(0.018)	(0.016)	(0.097)	(0.096)	(0.119)	(0.098)
News Coverage	0.120	0.132	0.054	0.103	0.306	0.449	0.101	0.210
	(0.087)	(0.084)	(0.076)	(0.081)	(0.530)	(0.528)	(0.472)	(0.513)
Log GDP per Capita	-0.445	-0.441	-0.583*	-0.439	-1.310	-1.789	-4.687**	-1.534
	(0.331)	(0.432)	(0.331)	(0.351)	(2.399)	(2.455)	(1.851)	(2.276)
Log Population	-0.953	-1.398	-1.413	-1.636	9.406	11.811	8.910	5.421
	(1.086)	(1.491)	(1.164)	(1.174)	(8.321)	(8.772)	(8.637)	(7.721)
Security Council	0.003	0.004	0.004	0.006	-0.121	-0.316	0.073	-0.108
	(0.016)	(0.021)	(0.017)	(0.019)	(0.239)	(0.284)	(0.342)	(0.243)
Observations	117211	108399	109185	126369	1335	1266	1099	1351
Adj. Within R-Squared	0.1379	0.1385	0.1244	0.1365	0.2699	0.2681	0.2720	0.2674

Note: Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. Columns 1-4 include donor country, recipient region, year, month, and disaster-type fixed effects. Columns 5-8 include recipient country, year, month and disaster-type fixed effects.

Table 9: IV Regressions, Effect of Corruption on Disaster Responsiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OFDA	OFDA	OFDA	OFDA	OCHA	OCHA	OCHA	OCHA
ICRG Index	-0.020*				0.002			
	(0.012)				(0.013)			
TI Index		-0.013				0.009		
		(0.037)				(0.038)		
Kaufmann Index			-0.003				-0.062	
			(0.084)				(0.097)	
Heritage Index				0.001				-0.001
				(0.002)				(0.002)
Polity 2	0.001	0.003	-0.007	-0.002	0.001	0.003	0.003	-0.002
	(0.004)	(0.003)	(0.005)	(0.004)	(0.003)	(0.005)	(0.004)	(0.003)
Log Affected	0.020***	0.020***	0.021***	0.021***	0.021***	0.019***	0.018***	0.020***
	(0.003)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Log Killed	0.057***	0.059***	0.060***	0.057***	0.058***	0.052***	0.050***	0.058***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.006)	(0.007)	(0.009)	(0.006)
News Coverage	0.068***	0.060**	0.061	0.058**	0.091***	0.058**	0.057	0.078***
	(0.025)	(0.027)	(0.038)	(0.027)	(0.023)	(0.028)	(0.038)	(0.026)
Log GDP per Capita	0.033	-0.272**	-0.279**	-0.113	0.076	-0.133	-0.147	-0.062
	(0.061)	(0.110)	(0.114)	(0.082)	(0.068)	(0.127)	(0.103)	(0.073)
Log Population	-0.703***	-0.242	-0.560	-0.563	-0.104	0.522	0.406	-0.143
	(0.236)	(0.304)	(0.441)	(0.345)	(0.246)	(0.452)	(0.428)	(0.294)
Security Council	0.038**	0.024	0.022	0.035*	0.010	-0.006	0.006	0.009
	(0.017)	(0.018)	(0.027)	(0.020)	(0.026)	(0.032)	(0.038)	(0.030)
Observations	2493	1765	1406	2194	2617	1765	1406	2194
Adj. Within R-Squared	0.2000	0.2005	0.1729	0.1910	0.2105	0.1695	0.1251	0.1908
Overid P-value	0.591	0.299	0.0855	0.566	0.394	0.209	0.208	0.224

Note: 2SLS regressions. Dependent variable equals 1 if aid was provided. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects. Corruption is instrumented with the interaction of year fixed effects and ethnic, language, and religious fractionalization, as well as with a legal origin indicator and the share of Protestants in the country.

Table 10: IV Regressions, Effect of Corruption on Disaster Relief

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OFDA	OFDA	OFDA	OFDA	OCHA	OCHA	OCHA	OCHA
ICRG Index	-0.168				0.049			
	(0.119)				(0.167)			
TI Index		0.031				0.189		
		(0.405)				(0.507)		
Kaufmann Index			-0.701				-1.211	
			(0.992)				(1.330)	
Heritage Index				0.012				-0.009
				(0.023)				(0.032)
Polity 2	0.018	0.028	-0.071	-0.024	0.018	0.027	0.049	-0.022
	(0.047)	(0.040)	(0.065)	(0.041)	(0.040)	(0.069)	(0.048)	(0.041)
Log Affected	0.228***	0.221***	0.237***	0.238***	0.294***	0.267***	0.255***	0.281***
	(0.029)	(0.023)	(0.027)	(0.025)	(0.042)	(0.039)	(0.041)	(0.039)
Log Killed	0.711***	0.754***	0.751***	0.722***	0.849***	0.760***	0.710***	0.842***
	(0.053)	(0.064)	(0.070)	(0.058)	(0.087)	(0.110)	(0.131)	(0.090)
News Coverage	0.950***	0.891***	0.910**	0.870***	1.363***	0.958***	0.834*	1.135***
	(0.298)	(0.310)	(0.460)	(0.319)	(0.326)	(0.358)	(0.469)	(0.350)
Log GDP per Capita	0.457	-2.380*	-1.986	-0.619	0.561	-2.018	-2.431*	-0.863
	(0.660)	(1.223)	(1.236)	(0.832)	(0.826)	(1.708)	(1.301)	(0.942)
Log Population	-6.483**	-3.022	-4.071	-4.848	-2.096	7.148	5.320	-0.897
	(2.527)	(3.581)	(4.676)	(3.746)	(2.933)	(6.076)	(5.493)	(3.914)
Security Council	0.436**	0.285	0.173	0.407*	0.051	-0.118	-0.074	0.012
	(0.200)	(0.212)	(0.315)	(0.225)	(0.330)	(0.413)	(0.492)	(0.392)
Observations	2493	1765	1406	2194	2612	1764	1404	2192
	108	103	110	117	108	103	110	117
Adj. Within R-Squared	0.2238	0.2317	0.1901	0.2159	0.2311	0.1865	0.1343	0.2119
Overid p-value	0.430	0.275	0.0692	0.397	0.514	0.324	0.190	0.344

Note: 2SLS regressions. Dependent variable is the log of OFDA or OCHA Aid. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects. Corruption is instrumented with the interaction of year fixed effects and ethnic, language, and religious fractionalization, as well as with a legal origin indicator and the share of Protestants in the country.

Table 11: Effect of Corruption by Disaster Type on Responsiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OFDA	OFDA	OFDA	OFDA	OCHA	OCHA	OCHA	OCHA
	ICRG	TI	Kaufmann	Heritage	ICRG	TI	Kaufmann	Heritage
Corrupt*Volcano	-0.005	-0.002	-0.015	-0.001	0.001	-0.003	-0.008	-0.001
	(0.012)	(0.016)	(0.016)	(0.001)	(0.012)	(0.016)	(0.016)	(0.001)
Corrupt*Slide	-0.023***	-0.023***	-0.030***	-0.002***	-0.020***	-0.027***	-0.028***	-0.003***
	(0.005)	(0.006)	(0.010)	(0.001)	(0.007)	(0.008)	(0.010)	(0.001)
Corrupt*Temperature	-0.032***	-0.036***	-0.045***	-0.003***	-0.028***	-0.033***	-0.033***	-0.003***
	(0.005)	(0.005)	(0.008)	(0.000)	(0.006)	(0.007)	(0.009)	(0.001)
Corrupt*Flood	-0.021***	-0.022***	-0.028***	-0.002***	-0.012**	-0.017**	-0.016*	-0.001**
	(0.005)	(0.005)	(0.009)	(0.000)	(0.005)	(0.007)	(0.009)	(0.001)
Corrupt*Earthquake	-0.009	-0.013**	-0.018*	-0.001***	0.000	-0.005	0.005	-0.001
	(0.006)	(0.006)	(0.010)	(0.000)	(0.006)	(0.006)	(0.009)	(0.001)
Corrupt*Storm	-0.023***	-0.025***	-0.029***	-0.002***	-0.016**	-0.024***	-0.018*	-0.002***
	(0.005)	(0.005)	(0.009)	(0.000)	(0.006)	(0.008)	(0.009)	(0.001)
Polity2	0.002	0.003	-0.006	-0.002	0.001	0.004	0.003	-0.002
	(0.004)	(0.003)	(0.005)	(0.003)	(0.003)	(0.005)	(0.004)	(0.003)
Log Affected	0.021***	0.020***	0.023***	0.022***	0.023***	0.020***	0.019***	0.021***
	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Log Killed	0.057***	0.059***	0.058***	0.057***	0.055***	0.050***	0.047***	0.055***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.006)	(0.007)	(0.009)	(0.006)
News Coverage	0.072***	0.069**	0.064*	0.062**	0.107***	0.063**	0.081*	0.094***
	(0.025)	(0.027)	(0.037)	(0.027)	(0.025)	(0.028)	(0.042)	(0.030)
Log GDP per Capita	0.031	-0.279***	-0.275***	-0.143*	0.113*	-0.161	-0.196*	-0.081
	(0.050)	(0.101)	(0.099)	(0.078)	(0.057)	(0.115)	(0.108)	(0.072)
Log Population	-0.751***	-0.181	-0.560	-0.643*	-0.247	0.578	0.189	-0.280
	(0.233)	(0.296)	(0.407)	(0.328)	(0.237)	(0.425)	(0.437)	(0.317)
Security Council	0.038**	0.020	0.015	0.026	0.012	-0.005	0.010	0.005
	(0.018)	(0.019)	(0.027)	(0.021)	(0.026)	(0.030)	(0.036)	(0.029)
Observations	2555	1805	1460	2254	2682	1805	1460	2254
Adj. Within R-Squared	0.2460	0.2540	0.2444	0.2446	0.2440	0.2208	0.1976	0.2357

Note: Linear Probability OLS regressions. Dependent variable is dummy equal to 1 if relief was provided (OFDA or OCHA). Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects. Columns labeled ICRG, TI, Kaufmann, and Heritage indicate corruption index used.

Table 12: Effect of Corruption by Disaster Type on Aid

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OFDA	OFDA	OFDA	OFDA	OCHA	OCHA	OCHA	OCHA
	ICRG	TI	Kaufmann	Heritage	ICRG	TI	Kaufmann	Heritage
Corrupt*Volcano	-0.043	-0.020	-0.140	-0.012	0.054	-0.033	-0.062	-0.012
	(0.137)	(0.178)	(0.201)	(0.015)	(0.175)	(0.232)	(0.244)	(0.017)
Corrupt*Slide	-0.270***	-0.278***	-0.350***	-0.030***	-0.298***	-0.390***	-0.394***	-0.040***
	(0.063)	(0.076)	(0.120)	(0.007)	(0.094)	(0.122)	(0.143)	(0.010)
Corrupt*Temperature	-0.384***	-0.433***	-0.534***	-0.041***	-0.411***	-0.475***	-0.459***	-0.048***
	(0.060)	(0.066)	(0.102)	(0.006)	(0.082)	(0.106)	(0.126)	(0.009)
Corrupt*Flood	-0.241***	-0.254***	-0.316***	-0.026***	-0.162**	-0.243**	-0.199	-0.022**
	(0.055)	(0.059)	(0.103)	(0.005)	(0.073)	(0.112)	(0.126)	(0.010)
Corrupt*Earthquake	-0.086	-0.132*	-0.193*	-0.014**	0.022	-0.069	0.064	-0.008
	(0.064)	(0.071)	(0.114)	(0.006)	(0.079)	(0.101)	(0.125)	(0.009)
Corrupt*Storm	-0.261***	-0.279***	-0.323***	-0.028***	-0.242***	-0.344***	-0.281**	-0.032***
	(0.054)	(0.057)	(0.100)	(0.005)	(0.085)	(0.113)	(0.125)	(0.010)
Polity2	0.025	0.037	-0.059	-0.017	0.022	0.046	0.043	-0.025
	(0.048)	(0.040)	(0.060)	(0.039)	(0.043)	(0.066)	(0.047)	(0.042)
Log Affected	0.237***	0.232***	0.254***	0.248***	0.304***	0.275***	0.261***	0.291***
	(0.030)	(0.026)	(0.029)	(0.026)	(0.044)	(0.042)	(0.043)	(0.041)
Log Killed	0.719***	0.748***	0.740***	0.724***	0.821***	0.737***	0.690***	0.815***
	(0.053)	(0.065)	(0.072)	(0.060)	(0.084)	(0.108)	(0.128)	(0.090)
News Coverage	1.022***	1.015***	0.935**	0.931***	1.460***	0.957***	0.886**	1.156***
	(0.295)	(0.308)	(0.449)	(0.319)	(0.316)	(0.348)	(0.441)	(0.345)
Log GDP per Capita	0.555	-2.632**	-2.239**	-0.994	1.058	-2.517	-3.323**	-1.244
	(0.551)	(1.111)	(0.929)	(0.757)	(0.711)	(1.572)	(1.410)	(0.957)
Log Population	-7.218***	-1.920	-5.094	-5.658	-4.667	7.946	0.819	-2.645
	(2.527)	(3.497)	(4.454)	(3.512)	(2.848)	(5.682)	(5.932)	(4.209)
Security Council	0.436**	0.255	0.179	0.304	0.096	-0.096	0.045	-0.074
	(0.200)	(0.213)	(0.299)	(0.232)	(0.337)	(0.388)	(0.467)	(0.387)
Observations	2555	1805	1460	2254	2668	1802	1454	2247
Adj. Within R-Squared	0.2703	0.2848	0.2641	0.2709	0.2654	0.2390	0.2090	0.2572

Note: OLS regressions. Dependent variable is the log of OFDA or OCHA Aid. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects. Columns labeled ICRG, TI, Kaufmann, and Heritage indicate corruption index used.

Table 13: Effect of Disaster Type on Corruption

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	ICRG	ICRG	TI	TI	Kaufmann	Kaufmann	Heritage	Heritage
Flood	0.026	0.011	0.015	-0.058	0.022	-0.057	0.262	-0.244
	(0.097)	(0.140)	(0.036)	(0.122)	(0.031)	(0.123)	(0.732)	(1.256)
Earthquake	-0.056	0.036	0.010	0.069	0.050	0.183	0.451	2.074
	(0.113)	(0.164)	(0.034)	(0.143)	(0.044)	(0.160)	(0.833)	(1.550)
Volcano	0.128	0.233	0.009	0.161	0.021	0.184	1.261	2.926
	(0.156)	(0.204)	(0.070)	(0.240)	(0.064)	(0.206)	(1.606)	(2.322)
Windstorm	-0.010	-0.092	0.062*	-0.073	0.040	-0.112	0.113	-0.130
	(0.096)	(0.147)	(0.035)	(0.127)	(0.035)	(0.143)	(0.836)	(1.269)
Slides	0.112	0.115	0.054	0.027	0.046	0.030	-0.224	0.065
	(0.117)	(0.171)	(0.045)	(0.153)	(0.040)	(0.144)	(0.866)	(1.614)
Temperature	-0.015	-0.004	0.011	-0.041	0.013	-0.172	0.042	-0.292
	(0.118)	(0.167)	(0.038)	(0.128)	(0.030)	(0.144)	(0.998)	(1.668)
Polity2	-0.071***	-0.087***	0.031***	0.001	0.004	-0.024*	0.061	-0.344**
	(0.026)	(0.029)	(0.009)	(0.020)	(0.014)	(0.014)	(0.214)	(0.146)
Log GDP per capita	1.434*	-0.347	-1.007**	-1.311***	0.496	-1.129***	-10.999*	-14.091***
	(0.850)	(0.293)	(0.430)	(0.176)	(0.589)	(0.140)	(5.802)	(1.741)
Log Population	-5.547***	0.099	2.618	0.202***	1.607*	0.165***	-30.317	2.090***
	(1.622)	(0.100)	(1.751)	(0.073)	(0.882)	(0.059)	(20.451)	(0.645)
Country fixed effects?	Yes	No	Yes	No	Yes	No	Yes	No
Region fixed effects?	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3648	3648	1805	1805	1460	1460	2254	2254
Adj. Within R-Squared	0.4127		0.0707		0.0812		0.0369	
Adj. R-Squared		0.6059		0.8292		0.8318		0.7715

Note: OLS regressions. Dependent variable is the ICRG, TI, Kaufmann et al. (2007), or Heritage Foundation corruption indicator. Robust standard errors in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include year fixed effects.

Appendix Table 1: Probit Regressions, Effect of Corruption on Responsiveness to Disaster

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OFDA	OFDA	OFDA	OFDA	OCHA	OCHA	OCHA	OCHA
ICRG Index	-0.120**				0.028			
	(0.053)				(0.062)			
TI Index		0.140				-0.062		
		(0.152)				(0.107)		
Kaufmann Index			0.294				-0.323	
			(0.265)				(0.221)	
Heritage Index				-0.007				-0.008
				(0.009)				(0.008)
Polity 2	0.008	0.007	-0.044	-0.018	0.015	0.004	0.028	-0.009
	(0.029)	(0.030)	(0.040)	(0.027)	(0.019)	(0.028)	(0.024)	(0.019)
Log Affected	0.236***	0.264***	0.279***	0.297***	0.198***	0.177***	0.154***	0.166***
	(0.036)	(0.034)	(0.042)	(0.032)	(0.029)	(0.033)	(0.036)	(0.028)
Log Killed	0.385***	0.434***	0.461***	0.373***	0.267***	0.247***	0.247***	0.282***
	(0.031)	(0.049)	(0.061)	(0.042)	(0.038)	(0.054)	(0.060)	(0.043)
News Coverage	0.361*	0.579**	0.480*	0.444**	0.471***	0.433*	0.446*	0.456**
	(0.188)	(0.239)	(0.270)	(0.215)	(0.178)	(0.242)	(0.264)	(0.199)
Log GDP per Capita	-0.569	-3.083***	-3.150***	-1.177	0.729	-1.229	-1.165	-0.684
	(0.547)	(1.155)	(0.961)	(0.856)	(0.489)	(1.261)	(0.867)	(0.588)
Log Population	-8.517***	-7.472*	-8.389**	-7.765**	-0.043	5.522	3.397	-2.042
	(2.273)	(4.020)	(3.948)	(3.528)	(1.591)	(4.358)	(3.432)	(2.366)
Security Council	0.298**	0.153	0.126	0.236	0.053	-0.196	-0.071	0.018
	(0.152)	(0.205)	(0.232)	(0.210)	(0.184)	(0.284)	(0.305)	(0.223)
Observations	2212	1508	1067	1911	2278	1392	1093	1831
Pseudo R-Squared	0.4938	0.5368	0.5321	0.5176	0.4495	0.4377	0.4173	0.4321

Note: Probit regressions. Dependent variable equals 1 if disaster relief was provided (OFDA or OCHA). Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include country, year, month, and disaster-type fixed effects.

Appendix Table 2: Tobit Regressions, Effect of Corruption on U.S. Disaster Relief

	(1)	(2)	(3)	(4)
ICRG Index	-1.045***			
	(0.340)			
TI Index		0.674		
		(0.640)		
Kaufmann Index			-0.584	
			(0.771)	
Heritage Index				-0.038
				(0.049)
Polity 2	0.047	-0.312**	-0.300*	-0.100
	(0.172)	(0.145)	(0.164)	(0.163)
Log Affected	2.193***	2.263***	2.269***	2.507***
	(0.229)	(0.179)	(0.223)	(0.212)
Log Killed	3.702***	3.575***	3.590***	3.327***
	(0.280)	(0.300)	(0.364)	(0.289)
News Coverage	2.143	4.018*	2.390	1.973
	(1.818)	(2.140)	(2.368)	(2.028)
Log GDP per Capita	-2.926***	0.618	-1.227	-1.422
	(1.061)	(1.205)	(1.466)	(1.412)
Log Population	-3.085***	-3.627***	-3.473***	-3.100***
	(0.416)	(0.550)	(0.568)	(0.533)
Security Council	2.293	-3.206*	-1.704	0.621
	(1.637)	(1.821)	(2.305)	(1.868)
Observations	2555	1805	1460	2254
Pseudo R-Squared	0.2258	0.2385	0.2198	0.2208
Left Censored	2283	1618	1295	2002

Note: Tobit regressions, left-censored at zero. Dependent variable is the log of OFDA aid. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include year, month, region, and disaster-type fixed effects.

Appendix Table 3: Effect of Corruption on Disaster Relief, Countries Receiving Aid Only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OFDA	OFDA	OFDA	OFDA	OCHA	OCHA	OCHA	OCHA
ICRG Index	0.158				-0.009			
	(0.136)				(0.118)			
TI Index		0.397				0.072		
		(0.241)				(0.135)		
Kaufmann Index			0.156				0.114	
			(0.403)				(0.745)	
Heritage Index				-0.005				0.030
				(0.013)				(0.018)
Polity 2	-0.008	-0.059	-0.050	-0.007	0.026	-0.147**	-0.115	-0.001
	(0.037)	(0.047)	(0.069)	(0.036)	(0.030)	(0.064)	(0.071)	(0.039)
Log Affected	0.126	0.137*	0.191**	0.157**	0.192*	0.042	0.025	0.151
	(0.085)	(0.073)	(0.081)	(0.065)	(0.099)	(0.138)	(0.169)	(0.115)
Log Killed	0.444***	0.430***	0.467***	0.452***	0.637***	0.715***	0.565***	0.649***
	(0.074)	(0.074)	(0.058)	(0.061)	(0.070)	(0.113)	(0.125)	(0.072)
News Coverage	0.550	0.560	0.951**	0.819**	-0.031	0.573	0.112	0.290
	(0.421)	(0.408)	(0.474)	(0.368)	(0.365)	(0.502)	(0.756)	(0.483)
Log GDP per Capita	2.874**	6.197***	3.783*	4.372***	0.225	-1.519	-1.355	0.046
	(1.386)	(2.158)	(1.940)	(1.334)	(1.755)	(3.876)	(2.861)	(1.879)
Log Population	2.676	12.739*	5.673	4.502	4.998	9.603	-4.913	5.165
	(3.300)	(7.362)	(7.048)	(3.860)	(5.374)	(12.842)	(14.673)	(8.161)
Security Council	0.346	0.509	0.762*	0.370	0.322	0.082	-1.092*	0.199
	(0.336)	(0.351)	(0.427)	(0.257)	(0.277)	(0.429)	(0.605)	(0.425)
Observations	243	163	143	220	299	176	146	252
Adj. Within R-Squared	0.4247	0.6409	0.5203	0.5119	0.3660	0.4240	0.4239	0.3793

Note: OLS regressions. Dependent variable is the log of OFDA or OCHA aid. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include disaster-type, month, year and country fixed effects.

Appendix Table 4: IV Probit Regressions, Effect of Corruption on Responsiveness to Disaster

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OFDA	OFDA	OFDA	OFDA	OCHA	OCHA	OCHA
ICRG Index	-0.137*				0.121		
	(0.084)				(0.106)		
TI Index		-0.576				0.014	
		(0.619)				(0.460)	
Kaufmann Index			-0.892				
			(1.012)				
Heritage Index				0.038			-0.001
				(0.032)			(0.023)
Polity 2	0.015	0.036	-0.016	-0.008	0.011	-0.002	-0.013
	(0.029)	(0.033)	(0.044)	(0.029)	(0.018)	(0.032)	(0.020)
Log Affected	0.236***	0.249***	0.264***	0.280***	0.192***	0.179***	0.162***
	(0.037)	(0.037)	(0.044)	(0.036)	(0.029)	(0.034)	(0.028)
Log Killed	0.375***	0.419***	0.425***	0.358***	0.284***	0.260***	0.301***
	(0.032)	(0.054)	(0.070)	(0.045)	(0.039)	(0.056)	(0.044)
News Coverage	0.391**	0.540**	0.399	0.404*	0.455**	0.472*	0.421**
	(0.199)	(0.224)	(0.257)	(0.213)	(0.181)	(0.244)	(0.200)
Log GDP per Capita	-0.075	-2.952**	-0.145	0.169	0.023	-1.230	-0.335
	(0.408)	(1.163)	(0.504)	(0.696)	(0.262)	(1.380)	(0.439)
Log Population	-0.457	0.136	-1.786	2.648***	-0.118	5.736	-1.331**
	(0.438)	(0.184)	(2.322)	(0.717)	(0.304)	(4.442)	(0.552)
Security Council	0.336**	0.217	0.043	0.311	0.067	-0.218	0.006
	(0.148)	(0.170)	(0.316)	(0.204)	(0.183)	(0.292)	(0.226)
Observations	2191	1497	1048	1893	2234	1384	1801

Note: IV Probit regressions. Dependent variable equals 1 if relief was provided (OFDA or OCHA). Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include month, year, disaster-type, and country fixed effects.

Appendix Table 5: IV Tobit Regressions, Effect of Corruption on Disaster Relief

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OFDA	OFDA	OFDA	OFDA	OCHA	OCHA	OCHA	OCHA
ICRG Index	-1.548*				0.175			
	(0.825)				(2.265)			
TI Index		-5.560				4.156		
		(6.536)				(8.304)		
Kaufmann Index			0.300				-9.979	
			(10.860)				(10.814)	
Heritage Index				0.131				-0.035
				(0.295)				(0.290)
Polity 2	0.133	0.356	-0.365	-0.051	0.174	-0.239	0.380	-0.085
	(0.290)	(0.392)	(0.336)	(0.241)	(0.221)	(0.455)	(0.293)	(0.211)
Log Affected	2.369***	2.311***	2.237***	2.668***	2.373***	2.256***	1.966***	2.048***
	(0.291)	(0.217)	(0.253)	(0.243)	(0.247)	(0.293)	(0.375)	(0.259)
Log Killed	3.368***	3.376***	3.528***	2.980***	3.195***	2.967***	3.000***	3.354***
	(0.329)	(0.285)	(0.380)	(0.290)	(0.302)	(0.479)	(0.534)	(0.323)
News Coverage	3.516*	4.211*	3.281	3.334*	4.826***	5.454**	4.252	4.684**
	(1.894)	(2.152)	(2.274)	(1.926)	(1.751)	(2.744)	(3.165)	(2.086)
Log GDP per Capita	1.508	-20.828*	-12.755	1.183	5.745	-18.924	-8.750	-1.162
	(3.604)	(12.184)	(9.145)	(4.460)	(8.149)	(16.810)	(9.588)	(4.557)
Log Population	-2.166	0.842	-42.975	21.232***	-6.953	15.605	65.871	-3.115
	(4.389)	(1.802)	(38.893)	(6.069)	(24.112)	(12.216)	(45.160)	(7.529)
Security Council	3.294**	1.794	1.139	3.052	0.495	-3.022	-1.995	-0.655
	(1.477)	(1.734)	(2.484)	(1.867)	(2.049)	(3.651)	(4.235)	(2.784)
Observations	2497	1778	1425	2203	2616	1777	1423	2201
Left censored	2233	1597	1266	1957	2281	1579	1259	1919

Note: IV Tobit regressions. Dependent variable is the log of OFDA or OCHA aid. Robust standard errors clustered by recipient country in parenthesis. *** denotes significance at the 1% level; ** at the 5% level; and * at the 10% level. All regressions include month, disaster-type, year and country fixed effects.