Signals, Channels, and Political Connections in Government Disaster Response

by

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Dedication

For my amazing wife, Lisa.

Acknowledgements

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Abstract

This dissertation analyzes the motivations of governments, both foreign and domestic, in responding to natural disasters. I address government responses to natural disasters in the following contexts: 1) the use of signaling by aid-giving donor countries in providing humanitarian relief to non-strategic recipients; 2) the effect of donor types and recipient democratic institutions on the channels of relief aid delivery; and 3) the influence of political connections between upper-level and lower-level politicians on reconstruction fund distribution in a disaster-prone country.

Chapter 1

Introduction

On the day after Christmas in 2004, people around the world awoke to reports of a terrible disaster in Southeast Asia. An earthquake off the coast of Indonesia had triggered a tsunami that devastated coastal areas in fourteen countries. The catastrophe caused more than 220,000 deaths and nearly $10 billion USD in damages.[1] Governments, foreign and domestic, scrambled to respond to the widespread chaos.

While the magnitude and scope of the disaster was unprecedented, the occurrence of devastating natural disasters seems to be an increasing norm. Figure 1 shows the total number of deaths and estimated damages caused by natural disasters from 1992-2013.[2] In the last decade alone, spikes in death tolls and/or estimated damages occurred in 2004 (Indian Ocean tsunami), 2005 (Hurricane Katrina & Kashmir earthquake), 2008 (Sichuan earthquake), 2010 (Haiti earthquake), and 2011 (Japan tsunami).

When these disasters strike, government officials are (usually) quick to respond. Foreign governments often provide much needed relief aid and technical assistance. Following the 2004 Indian Ocean Tsunami, for example, nearly $6 billion USD went to the four most devastated countries in the first year alone (OCHA, 2012). Figure 2 shows that other major disasters, such as the 2005 Kashmir earthquake and the 2008 Sichuan earthquake, also prompted donors to provide more than $1 billion in humanitarian aid for victims of those dis-

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[1]http:\\www.emdat.be
[2]http:\\www.emdat.be

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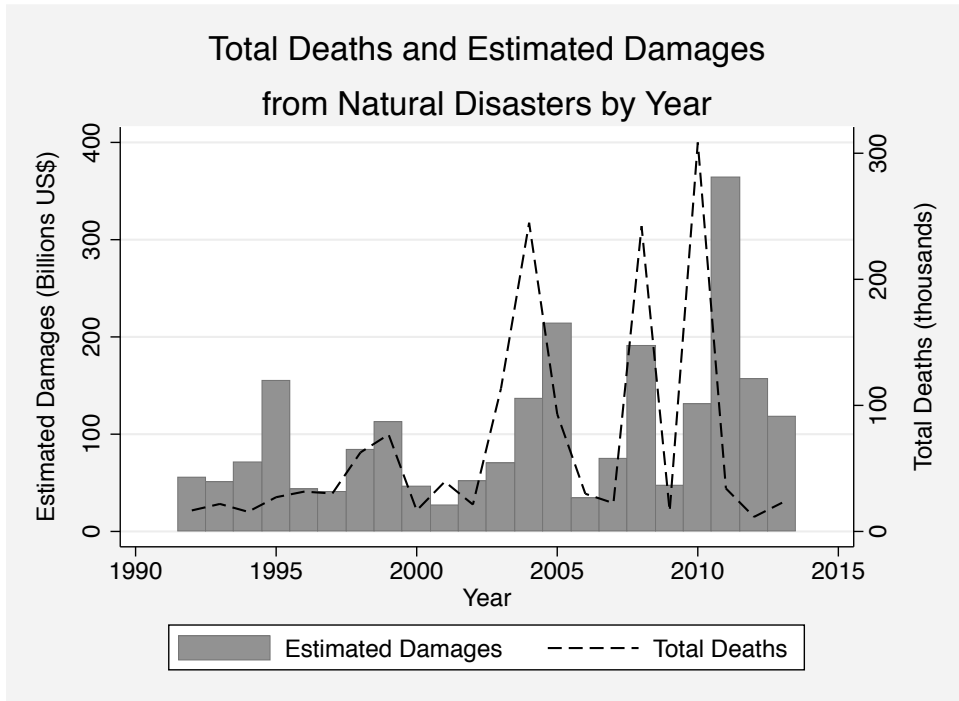
Figure 1: Deaths and Damages Caused by Natural Disasters

asters (OCHA, 2012). Likewise, domestic governments, using both foreign aid and domestic funds, coordinate the response and target areas for relief and reconstruction efforts. During the 2004 tsunami in Thailand, for example, Prime Minister Thaksin received immense praise for his hands-on and equitable approach in coordinating the relief efforts. According to a Thai political scientist who studies disaster management, "If the tsunami did not have Thaksin, it would have been much worse (for the citizens). If you take out the Thaksin node, the network (of disaster response) dies."[3] What prompts the outpouring of relief aid by foreign governments and the focused attention of domestic government officials following a natural disaster?

This dissertation analyzes the motivations of governments, both foreign and domestic, in responding to natural disasters. In the next three chapters, I address a broad arc of government responses to natural disasters including signaling by aid-giving donor countries, interactions between donor types and channels of aid delivery, and political connections

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[3]Dr. Tavida Kamolvej. *In-person interview.* June 7, 2013. Thammasat University, Bangkok, Thailand.
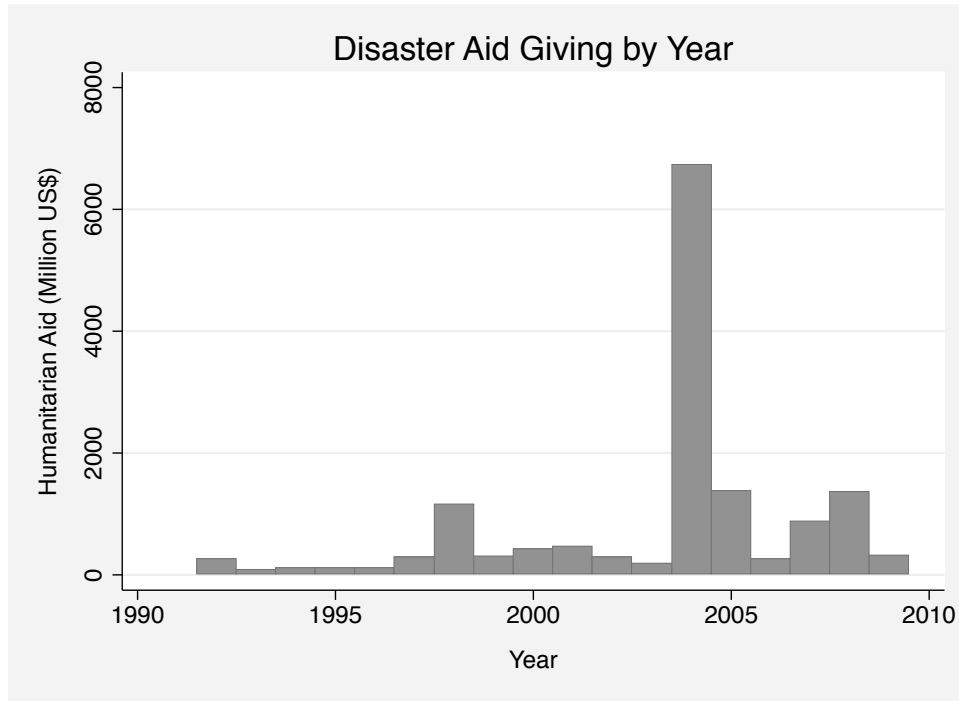
Figure 2: Humanitarian Aid Giving

between upper-level and lower-level politicians in a disaster-prone country. The following section outlines the remaining chapters in the dissertation.

1.1 DISSERTATION OUTLINE

Chapter 2 considers the role of bilateral strategic interests in motivating donor countries to provide relief aid to devastated recipient countries. The foreign aid literature suggests that bilateral strategic interests between the donor and recipient country dominate the motivation for foreign aid giving (Alesina and Dollar, 2000; Berthelémy and Tichit, 2004; Bueno de Mesquita and Smith, 2007, 2009; Kuziemko and Werker, 2006; Meernik, Krueger and Poe, 1998; McKinlay and Little, 1977; Schraeder, Hook and Taylor, 1998). Even in the context of humanitarian relief aid, bilateral strategic interests weigh heavily in the aid distribution decisions of donors (Fink and Redaelli, 2011; Raschky and Schwindt, 2012). A careful analysis of the relief aid recipient lists of many donors, however, shows the prevalence of numerous

countries with little strategic value for the donor.[4] This chapter asks the following question: If donors primarily distribute foreign aid for strategic gain, then why do certain donors provide relief aid to seemingly non-strategic recipients?

I argue that some (but not all) donors provide relief aid for the purpose of signaling their humanitarianism to the broader international community. This signaling action improves the reputation of the donor vis-a-vis these non-affected countries, which are future bargaining partners across a range of multilateral policy issues. The benefits gained via an improved reputation, however, depend on the geopolitical influence of the donor providing the relief aid. Donors with a high level of geopolitical influence benefit more from signaling humanitarianism (as compared to donors with low levels of geopolitical influence) due to their engagement in a broader range of multilateral policy negotiations. As a result, these donor types are more likely to provide relief aid to non-strategic recipients. Conversely, donors with low levels of geopolitical influence (who are engaged in fewer multilateral policy negotiations and gain little by improving reputation costs) are more likely to provide relief aid based primarily on bilateral strategic links. Using a principal component analysis, I construct measures for donor geopolitical influence, bilateral strategic interest and recipient humanitarian need and test this theory on a dataset of disaster relief aid from 1992-2009. The results provide strong evidence that geopolitical influence conditions the relief aid strategies chosen by donors.

Chapter 3 analyzes the distribution of relief aid based on donor types, aid delivery channels (bilateral vs. multilateral), and democratic institutions in the recipient country. Research into the determinants of foreign aid giving suggests different predictions for the effect of recipient country democratic institutions on the probability and amount of aid given by donor countries. While some suggest that better governance in recipient countries may increase the amount of aid provided by donors (Svensson, 1999; Burnside and Dollar, 2000; World Bank, 1998), others adhere to the notion that less democratic recipient governments

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[4]See Figures 3 and 5.

may be better poised to exchange donor aid for recipient policy concessions (Bueno de Mesquita and Smith, 2007, 2009). Empirical analyses using both development aid and disaster relief aid, however, show mixed results (Alesina and Dollar, 2000; Alesina and Weder, 2002; Fink and Redaelli, 2011; Raschky and Schwindt, 2012). This chapter asks the following question: do different donor types alter their relief aid delivery channels due to the presence or absence of democratic institutions in the recipient country?

I argue that the competing theoretical predictions and empirical results in the literature stem from neglecting to account for heterogeneity in the preferences of donors in their disbursal of aid. Donors who give for humanitarian reasons prefer to provide bilateral aid to democratic recipients who they believe will help facilitate the disbursal of aid according to the true needs of their citizens. Conversely, donors who give for strategic reasons prefer to give bilateral aid to less democratic recipients who they believe are more likely to provide policy concessions in exchange for aid. Using a dataset of post-disaster aid disbursals in 213 worldwide disasters from 1992-2001, I first distinguish between donor types based on their level of responsiveness to need. Then, I use a second data set of 272 worldwide disasters from 2002-2009 to test whether different donor types channel aid (bilaterally or multilaterally) based on the presence or absence of democratic institutions in a recipient country. The results suggest that more democratic institutions in recipient countries increase the bilateral proportion of total aid given by donors who are highly responsive to disasters, while the same level of democratic institutions reduces the bilateral proportion of total aid given by donors who have low levels of humanitarian responsiveness to disasters.

Chapter 4 shifts from discussing relief aid flows between countries to exploring the domestic government's response to natural disasters. Specifically, this chapter analyzes the distribution of reconstruction funds by members of the Philippine Congress following natural disasters. In considering the response of the domestic government, researchers have addressed both political motivations for disaster relief (Aldrich, 2010; Garrett and Sobel, 2003; May, 1985; Platt, 1999; Salkowe and Chakraborty, 2009) and the political outcomes of

providing these resources (Chen, 2013; Cole, Healy and Werker, 2012; Gasper and Reeves, 2011; Healy and Malhotra, 2009). Most of this research, however, focuses on the U.S. context[5] and considers political calculations based on politician-voter dynamics. This chapter asks the following question: to what extent do political connections *between politicians* (and not just between politician and voter) influence disaster response?

I argue (along with my co-authors Allen Hicken and Nico Ravanilla) that in states with weak-party systems (where parties are ephemeral and party-switching is rampant) it may be challenging for politicians to differentiate between a party's core and marginal supporters. In this context, politicians will try to maximize votes by allocating resources to local politicians with networks necessary for voter mobilization. In a post-disaster situation, politicians are faced with the task of dividing their scarce resources between several damaged areas. We hypothesize that a politician will favor an area controlled by a political ally. Furthermore, we argue that, in the case of the Philippines, 1) this political ally may be either a co-partisan or a co-ethnic and 2) co-ethnic ties will command a larger distribution of reconstruction funds than co-partisan ties.

To address this question, we produce a baseline estimate for post-disaster need by calculating a storm exposure measure for every municipality in the Philippines from 2001-2010. Then, controlling for storm exposure, we analyze the effect of political connections on reconstruction fund distribution from House legislators to municipal mayors. Our analysis shows that political connections, especially clan ties, increase reconstruction funds allocated to a given municipality. These results suggest that a more needs-based disaster response may require placing a limit on political discretion in the disbursement of post-disaster funds.

Chapter 5 concludes the dissertation. In this chapter, I recap the analyses and highlight the contributions from the preceding chapters. I also consider avenues for future research.

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[5]See Aldrich (2010) and Cole, Healy and Werker (2012) for examples of political calculations in disaster relief spending in India.

Chapter 2

Signaling Humanitarianism: How Geopolitical Influence Affects Donor Disaster Relief Aid Strategies

2.1 INTRODUCTION

On the morning of October 8th, 2005, a powerful 7.6 magnitude earthquake struck the Kashmir region of Pakistan. The disaster resulted in more than 73,000 deaths, affected more than 5 million people, and resulted in an estimated $5.2 billion USD in damages (CRED - Université Catholique de Louvain - Brussels, Belgium, 2012). The international humanitarian aid community responded to the earthquake in Pakistan by sending thousands of relief personnel and by providing more than $1 billion USD of relief aid (OCHA, 2012).[6] In addition to the 2005 Kashmir earthquake, donors responded to the 2004 Indian Ocean Tsunami, the 2008 China earthquake, the 2010 earthquake in Haiti, and the 2011 Japanese tsunami and nuclear disaster with more than $1 billion in humanitarian aid for victims in each disaster (OCHA, 2012). What prompts such an outpouring of humanitarian relief following these natural disasters?

Most of the research to date suggests that bilateral strategic interests between the donor and recipient country dominate the motivation for foreign aid giving. Scholars have argued that bilateral trade (Schraeder, Hook and Taylor, 1998; Meernik, Krueger and Poe, 1998;

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[6]The United States government alone committed more than $200 million USD to help victims of this disaster (OCHA, 2012).

Berthelémy and Tichit, 2004; Bueno de Mesquita and Smith, 2007, 2009), security alliances (Schraeder, Hook and Taylor, 1998; Meernik, Krueger and Poe, 1998; Bueno de Mesquita and Smith, 2007, 2009), open market access (Meernik, Krueger and Poe, 1998; Alesina and Dollar, 2000), seats on the UN Security Council (Kuziemko and Werker, 2006), similarities in UN voting patterns (Alesina and Dollar, 2000), and colonial relationships (Schraeder, Hook and Taylor, 1998; Alesina and Dollar, 2000; Berthelémy and Tichit, 2004; Bueno de Mesquita and Smith, 2009) are the driving force behind aid-giving patterns. Even in the context of humanitarian relief aid, research suggests that bilateral strategic interests dominate the distribution decisions of donors (Fink and Redaelli, 2011; Raschky and Schwindt, 2012). For example, Figure 3 shows that many countries with obvious economic (e.g. Mexico) and security (e.g. Pakistan) bilateral ties to the United States receive substantial amounts of relief aid.
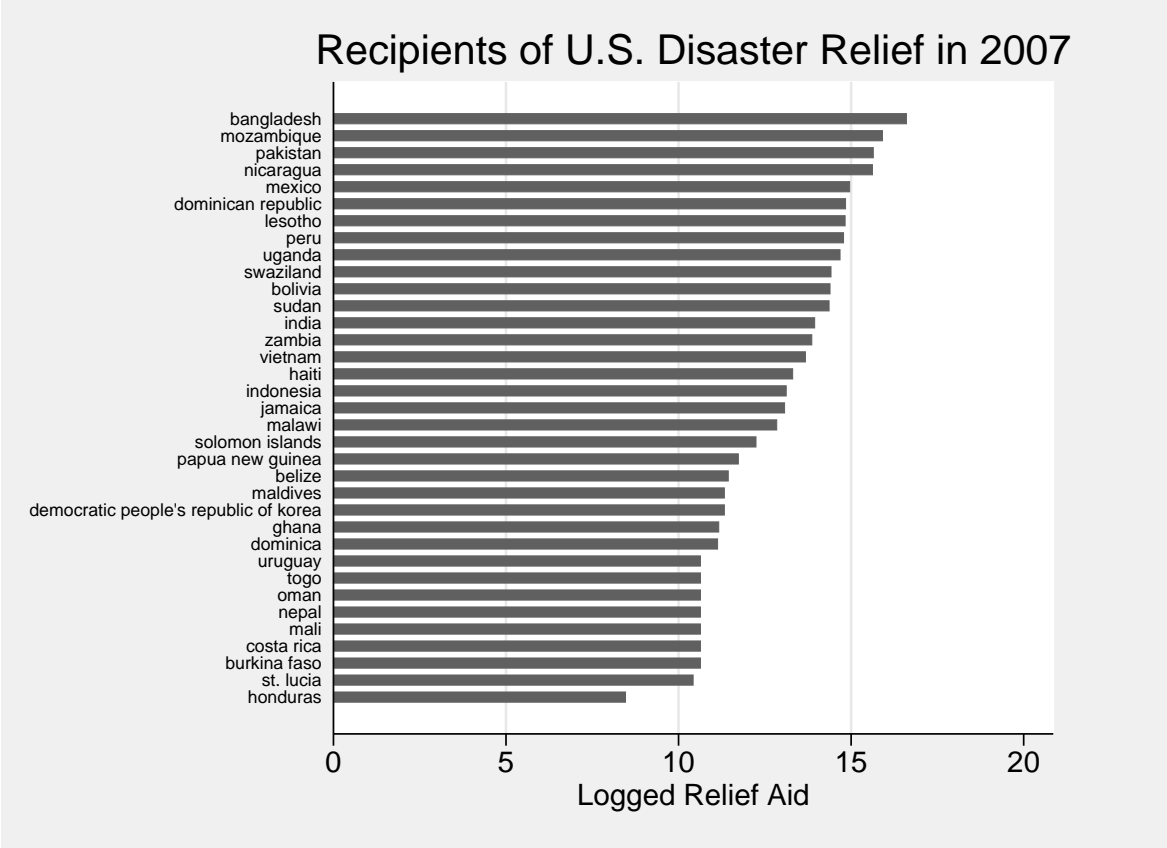
Figure 3: Recipients of US Disaster Relief in 2007

A careful look at the recipient list in Figure 3, however, offers plenty of examples of disaster aid recipients with less obvious strategic relationships with the United States. Mozambique, Swaziland, and Lesotho all received substantial amounts of relief aid from the US in 2007; none of these countries, however, appear strategically important to the economic and security interests of the U.S. Similarly, many recipients of Japanese relief aid offer no obvious bilateral strategic advantage.[7] For example, the Japanese government donated money to more than a dozen recipients in 2007, most of which were in Latin America or sub-saharan Africa and are countries where we would not expect Japan relief aid to flow based on bilateral strategic links (OCHA, 2012). If donors primarily distribute foreign aid for strategic gain, then why do certain donors provide relief aid to seemingly non-strategic recipients?

Some (but not all) donors provide aid for the purpose of signaling their humanitarianism to the broader international community. This signaling action improves the reputation of the donor vis-a-vis these non-affected countries, which are future bargaining partners across a range of multilateral policy issues. The benefits gained via an improved reputation, however, depend on the geopolitical influence of the donor providing the relief aid. Donors with a high level of geopolitical influence benefit more from signaling humanitarianism (as compared to donors with low levels of geopolitical influence) due to their engagement in a broader range of multilateral policy negotiations. As a result, these donor types are more likely to provide relief aid to non-strategic recipients. Conversely, donors with low levels of geopolitical influence (who are engaged in fewer multilateral policy negotiations and gain little by improving reputation costs) are more likely to provide relief aid based primarily on bilateral strategic links. Using a principal component analysis, I construct measures for donor geopolitical influence, bilateral strategic interest and recipient humanitarian need and test this theory on a dataset of disaster relief aid from 1992-2009. The results provide strong evidence that geopolitical influence conditions the relief aid strategies chosen by donors.

This chapter makes several contributions. First, I provide a unifying theory that explains

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[7]See Figure 5 in Appendix.

differences in aid motivations across a set of donors based on geopolitical influence. This theoretical approach differs from earlier research into the determinants of foreign aid, which either assumes all donors are homogenous in their motivations, provides case studies of a few donors with different explanations for each, or shows empirical differences in motivations without developing an accompanying theory to explain these differences (McKinlay and Little, 1977; Alesina and Dollar, 2000; Schraeder, Hook and Taylor, 1998; Berthelémy, 2006). Second, I use principal component analysis to develop composite measures of concepts such as geopolitical influence, humanitarian need, and bilateral strategic interests. These composite measures allow for an analysis of how each of these broader concepts might impact patterns of disaster relief giving. Finally, I provide empirical results that reveal differences in the strategic approaches to relief aid distribution for the largest bilateral donors.

The paper proceeds as follows. Section 2.2 provides background on research into the determinants of foreign aid giving and identifies gaps in the literature. Section 2.3 provides a theory of donor aid strategies based on geopolitical influence. Section 2.4 outlines the methodological approach and provides analysis of the appropriateness of the measures developed through principal component analysis. Section 2.5 tests the theory on a dataset of relief aid distributions of 18 DAC donors from 1992-2009 while Section 2.6 concludes.

2.2   PREVIOUS RESEARCH ON FOREIGN AID

Foreign aid research has shown that donors have different motivations for providing foreign aid. Early research on donor giving distinguished between two competing views of why countries might provide foreign aid: 1) the humanitarian view of aid, which proposes that the amount of aid received by low-income countries should be proportional to their social and economic needs and 2) the foreign policy view of aid, which postulates that aid is used to advance the strategic interest (economic, military, etc.) of the donor country (McKinlay and Little, 1977). To test these views, McKinlay and Little analyze official development aid, which consists of total grants and all loans with a grant element of at least 25% received minus

repayments of principal (World Bank, 2012b). They find no evidence for the humanitarian view that levels of foreign aid are correlated with social and economic needs of the recipient country, but do find strong evidence that bilateral strategic interests of the donor country dominate aid disbursal decisions.

Much of the research to date suggests that bilateral strategic interests between the donor and recipient country dominate the motivation for giving. Scholars have argued that bilateral trade (Schraeder, Hook and Taylor, 1998; Meernik, Krueger and Poe, 1998; Berthelémy and Tichit, 2004; Bueno de Mesquita and Smith, 2007, 2009), security alliances (Schraeder, Hook and Taylor, 1998; Meernik, Krueger and Poe, 1998; Bueno de Mesquita and Smith, 2007, 2009), open market access (Meernik, Krueger and Poe, 1998; Alesina and Dollar, 2000), seats on the UN Security Council (Kuziemko and Werker, 2006), similarities in UN voting patterns (Alesina and Dollar, 2000), and colonial relationships (Schraeder, Hook and Taylor, 1998; Alesina and Dollar, 2000; Berthelémy and Tichit, 2004; Bueno de Mesquita and Smith, 2009) are the driving force behind aid-giving patterns. Even in the context of humanitarian relief aid, bilateral strategic interests weigh heavily in the aid distribution decisions of donors (Fink and Redaelli, 2011; Raschky and Schwindt, 2012).

Whether looking at official development aid or humanitarian aid, most of the empirical literature on foreign aid practices has assumed homogenous preferences for aid donors. A few notable exceptions provide an empirical analysis that does not make this assumption. Berthelémy (2006) uses official development aid allocations and tests differences of parameters among donors to compare their degree of altruism. He argues that "aggregating donors is valid only under the assumption that all donors behave the same, which seems to be wrong." The results of his analysis suggest donor aid allocation patterns that range from the most altruistic donor (Switzerland) to the most egoistic donor (Australia) in terms of the elasticity of aid to trade intensity. Although not presented, the author develops similar classifications for other bilateral strategic interest variables. The authors, however, do not provide a theoretical basis for these empirical differences in giving patterns. Furthermore,

the disaggregation of each of the strategic as well as humanitarian concepts into multiple measures makes it more challenging to understand an overall egoistic or altruistic approach for each of the donors. Fink and Redaelli (2011) also allow for heterogeneity among donors in their analysis of the individual determinants of providing post-disaster humanitarian aid. They find some empirical differences in the key determinants of aid disbursals, but, similarly to Berthelémy (2006), provide no theoretical basis for these empirical results.

Schraeder, Hook and Taylor (1998) both assume donor heterogeneity in giving patterns and provide a theoretical basis for empirical differences. The authors compare the determinants of foreign aid giving among the American, Japanese, French and Swedish governments separately. Using official development aid in their empirical analysis, they argue that each donor had a unique strategic focus that drove its foreign policy agenda. While the authors do provide a theoretical basis for why each donor might distribute aid in a given way, each theory is unique to the donor and does not allow for a comparative understanding of why donors might differ in their aid strategies.

In addition to an underlying assumption of homogenous preferences for donors, the literature has focused on a dichotomy between humanitarian vs. strategic giving. Bueno de Mesquita and Smith (2009) provide an interesting theoretical argument that donors are motivated solely by the possibility of policy concessions in exchange for the provision of aid. Implicit to this argument is the idea that humanitarian need is not an important factor for donor countries. In the context of humanitarian relief aid, however, I would argue that considerations of both humanitarian need and bilateral strategic interests contribute to the decision process of donor governments for providing aid. Heinrich (2013) challenges the assumption in Bueno de Mesquita and Smith (2009) that donors provide aid solely in exchange for policy concessions by providing a theory of the conditions under which donors are humanitarian versus strategic in their giving patterns. While adding humanitarian motivations is an important contribution, his argument maintains the assumption that the strategic provision of foreign aid is limited to giving to recipients with strong bilateral economic or

security linkages. Being strategic in the provision of aid, however, may look different than simply providing aid primarily to trade partners and military allies.

This paper fills several gaps in the literature on foreign aid. Unlike most of the literature, I assume that donors are heterogenous in their underlying aid motivations. Furthermore, I provide a broadly comparative theoretical basis for noted empirical differences. I also expand a single concept of strategic giving to include different aid strategies based on donor types. The next section outlines the theory of how geopolitical influence yields different aid strategies and the expected effects of these different strategies on relief aid giving.

2.3   GEOPOLITICAL INFLUENCE AND RELIEF AID SIGNALING

This paper asks why some donors provide relief aid based primarily on strong bilateral ties, while others also provide aid to seemingly non-strategic recipients. In answering this question, I argue that these different giving patterns reflect the positive reputation benefits accrued to certain donors from signaling (to non-affected countries) their commitment to the international public good. Furthermore, these benefits are larger for donor countries with higher levels of geopolitical influence who are, therefore, more willing to give to non-strategic recipients.

When a major disaster occurs, government aid agencies often rush to the scene with personnel and relief funds. The media covers these response efforts, often citing press releases from governments that detail the levels of money and supplies provided.[8] While governments certainly announce the disbursement of non-humanitarian foreign aid, the heightened news coverage of disasters ensures that relief aid efforts tend to receive significantly more attention than aid provided for basic development. Governments use this publicity to emphasize their good works not only to the recipient audience, but also to other nations.

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[8]See   http://www.state.gov/secretary/remarks/2013/11/217432.htm,   https://www.gov.uk/government/news/typhoon-haiyan-uk-government-will-match-public-donations,   and http://www.foreignminister.gov.au/releases/Pages/2013/jb_mr_131109a.aspx?ministerid=4 for examples of recent government press releases following Typhoon Haiyan in the Philippines.

Do non-affected countries actually pay attention to how a given donor government responds to international crises? Fink and Redaelli (2011) show that governments are more likely to provide international relief aid when major donors respond, suggesting a bandwagon effect where donors desire to be seen as good citizens of the international community. At the very least, donors do not want to receive criticism for a poor response, as was the case with the recent reaction to the Chinese donor response following Typhoon Haiyan. Following the devastation in the Philippines, China, the world's second largest economy, pledged $100,000 USD in relief efforts (compared to tens of millions of US dollars committed by governments from the United States, the United Kingdom, and Australia). This response received criticism as sub-par and unbecoming of a responsible regional power. One newspaper headline strikingly noted that the world's second largest economy eventually donated less relief aid than just one well-known Swedish company.[9] Furthermore, most observers assumed that China's meager efforts were in response to territorial disputes in the South China Seas, which added to the criticism. Commenting on this reason for withholding relief aid, one political analyst noted that China missed an opportunity to showcase its "soft power" bilaterally and neglected to demonstrate to the broader international community the kind of responsible altruistic behavior expected due to its status.[10] In likely response to this criticism, China did increase its relief efforts slightly (though they still provided less money than several small regional neighbors). Nevertheless, the damage to its reputation as a responsible international community member suffered.

As the China example above demonstrates, donor country interactions with a recipient country can affect the donor's reputation with non-affected countries.[11] At its most basic level, the provision of relief aid demonstrates a willingness to promote the international public good. Thus, donor governments issue press releases, plaster their names on relief items and

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[9] http://www.theguardian.com/world/2013/nov/14/typhoon-haiyan-china-aid-philippines-ikea

[10] http://www.theguardian.com/world/2013/nov/14/typhoon-haiyan-china-aid-philippines-ikea

[11] International disaster response efforts are but one of many ways in which a country may enhance (or tarnish) its reputation within the international community. Other notable examples include military invasions, human rights abuses, etc. Nevertheless, I focus on reputation effects due to post-disaster relief.

project sites, and generally announce their good works. The potential boost (or decline) in reputation, however, is important beyond the limited context of disaster relief since these donor countries will interact with non-affected countries across a range of multilateral policy issues in the near future (e.g. security concerns, trade disputes, etc.).

To understand why reputation matters in the context of future multilateral policy negotiations, we can consider the provision of post-disaster international relief aid as an international norm that most countries (at the least, developed ones) are expected to uphold. Violation of this norm results in reputation costs, while upholding the norm (especially in certain contexts, as outlined below) can reap reputation benefits. Petermann (2013) explains how untying official development assistance (i.e. loosening the requirements attached to the provision of aid) results in the twin benefits of both helping recipients and "concurrently improv(ing) their own reputation on the international stage." A similar positive reputation effect can occur with the provision of international relief aid.

These reputation costs and benefits factor into future multilateral policy negotiations between the donor country and non-affected countries. Consider two countries, A and B, negotiating a multilateral policy deal (e.g. the response to the recent Russian annexation of Crimea or to the Syrian civil war). Each country has a desired policy based on benefits accrued for private strategic gains and benefits accrued from the international public good. If Country A has developed a positive reputation via the provision of disaster aid, it has signaled its willingness to contribute to the broader international public good. Country B takes this past action into account when determining the extent to which the stated current policy position of Country A is based on private strategic benefits. The greater the willingness of Country A to contribute to the international public good in the past, the less Country B discounts the current policy position of Country A as inherently private and strategic. For Country A, providing relief aid in the past in an attempt to improve its reputation may result in the ability to actually gain more in the current policy negotiation about which it may care more deeply (i.e. given its positive reputation, its current policy position can

be more private and strategic than Country B assumes, thus allowing Country A to gain more from the deal). Thus, Country A has an incentive to improve its reputation (via the provision of relief aid) in order to gain private strategic benefits in future multilateral policy negotiations.

Characteristics of both the recipient and the donor, however, affect the possible reputation benefits accrued by the donor in the provision of relief aid. As a starting point, donors will direct relief aid to the most devastated areas to signal their humanitarianism. In addition to signaling their willingness to contribute to the international public good, however, donor governments may provide relief aid due to more explicit strategic benefits such as trying to satisfy underlying altruistic motivations expected by domestic constituents,[12] attempting to win lucrative reconstruction phase contracts in the aftermath of the immediate emergency response,[13] or desiring to leverage an increased ability to extract policy concessions during times of intense humanitarian need.[14] Regardless of the motivation, all donors, irrespective of their geopolitical influence, should direct relief aid to the most devastated recipients.[15] The first hypothesis follows:

> *Hypothesis 1: All donors will respond positively to humanitarian need and geopolitical influence does not significantly condition this effect.*

While giving to the most devastated countries has the potential to signal a donor's commitment to the international public good, the strength of this signal depends on the strategic relationship between the donor and the recipient. Consider the humanitarian response

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[12] See Tingley (2010) and Heinrich (2013) for an analysis of the domestic political benefits accrued from providing foreign aid.

[13] Reconstruction aid provided in the eight years following the 2004 Indian Ocean Tsunami in Indonesia alone totaled more than $7 billion USD, with various contracts available for private, government, and NGOs alike (World Bank, 2012*a*)

[14] See Bueno de Mesquita and Smith (2009) for a theoretical argument for why countries with a greater need for aid sell foreign policy concessions at lower rates. See Klein (2007) for an interesting analysis of the use of coastal buffer zones by the Sri Lankan government following the 2004 Indian Ocean Tsunami to displace residents and promote tourism alongside international developers.

[15] This paper does not distinguish between the mechanisms outlined for why countries may provide more of their relief aid budget to the most devastated countries. Whether countries are providing aid to these disasters in response to domestic political pressures, economic returns, or some other form of policy concession exchange is beyond the scope of this paper.

following the 2005 earthquake in Pakistan. Given the highly strategic nature of their relationship, it is unsurprising that the US gave most of its 2005 relief aid budget to Pakistan. A non-affected country understands that the US would gain significant bilateral benefits from providing relief aid to Pakistan and would not update their perception of the commitment of the US to the international public good. Thus, the provision of relief aid to Pakistan would not provide any reputation benefits to the US. However, the US distribution of disaster relief aid to Djibouti, where there is relatively little bilateral strategic interest, provides an opportunity for the US. By providing aid to this country, the US demonstrates its willingness to contribute to the broader international public good because it stands to gain very little in bilateral strategic benefits from Djibouti. Thus, a donor government can accrue positive reputation benefits by choosing to respond to a recipient that experiences a disaster (especially a smaller one), but for which the donor has little strategic interest.

While non-strategic recipients make good targets for improving donor reputation, the extent to which a donor receives reputation benefits also depends on its geopolitical influence. Donors with high levels of geopolitical influence receive greater benefits than those with low levels of geopolitical influence. Highly influential donors are involved in a greater number of multilateral policy negotiations. The U.S. or China, by virtue of their economic, security, and diplomatic might, negotiate with numerous countries across a range of policy areas. Thus, a small positive reputation benefit for either country can translate into a large net gain when received over a large number of multilateral policy negotiations with many other countries. In contrast, donors with low levels of geopolitical influence do not have much bargaining leverage over many multilateral policy negotiations. Instead, they focus primarily on bilateral negotiations. As a result, they are likely to gain very little from improved reputation by providing aid to non-strategic recipients due to their limited engagement in multilateral negotiations.[16]

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[16]A possible alternative explanation is that donors with high levels of geopolitical influence simply have large aid budgets and can afford to provide relief aid to a wider range of recipients. The overlap between donor geopolitical influence and relief aid budget size, however, is far from perfect (with a moderately low correlation of .42). Furthermore, two of the five largest donors of relief aid in the past two decades, Sweden and Norway,

Geopolitical influence, therefore, influences the desire of donor countries to respond to seemingly non-strategic recipients. Donors with low levels of geopolitical influence receive little gain from providing relief aid to recipients who will not provide some benefit in future bilateral negotiations. This leads to the second hypothesis:

Hypothesis 2: Donors with low geopolitical influence will pursue a more targeted relief aid strategy that concentrates their funds on countries with existing bilateral strategic links.

In contrast, donors with high levels of geopolitical influence pursue a strategy that considers both bilateral links as well as future multilateral negotiations with non-affected countries. As such, they are more willing to provide relief aid across a wide range of recipients. This leads to the third and final hypothesis:

Hypothesis 3: Donors with high levels of geopolitical influence are more likely to provide relief aid to a given recipient following a disaster, regardless of either bilateral strategic interest or humanitarian need.

2.4 RESEARCH DESIGN

Measurement

The source for humanitarian aid is the Financial Tracking System (FTS) of the United Nations Office of the Coordination of Humanitarian Affairs (OCHA). This data set covers all disasters for which OCHA has issued an appeal for funding since 1992, which includes more than 1000 separate disasters. Each entry in this data set includes information on the

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are not typically considered among the most geopolitically influential countries. While their budgets are large, their giving patterns are more similar to the giving pattern of New Zealand (i.e. distributing to a few key recipients) than to the giving pattern of the United States. In 2005, for example, Norway concentrated its relief aid to only seven countries. Thus, donors with large budgets do not always distribute their resources across a range of strategic and non-strategic recipients alike. Nevertheless, to account for this potential alternative explanation, I do control for the size of the relief budget in the statistical analysis presented below.

name of the donor (countries, NGOs and private) and the amount of relief aid provided (OCHA, 2012). The dataset used for this analysis includes 18 donors and 164 recipients from 1992-2009.[17]

To test the first two hypotheses, I use the share of the yearly aid budget that donor i provides to recipient j in year t as the dependent variable. I focus on the yearly share of the aid budget rather than the typical measure of logged aid flows. The aid share measure controls for the wide variation in budgets of the different donors and allows me to test the relative importance (within-country) that each donor gives to each recipient. In 2009, for example, Portugal gave slightly more than $1 million USD in relief aid, while the US gave an amount that was fifty times larger (OCHA, 2012). The share of the aid budget for a particular donor and year shows, regardless of the size of the aid budget, the priorities given to each recipient (relative to other recipients) for that year, which is the goal of the analysis.

Finding an appropriate measure for each of the explanatory concepts in the theoretical section above is challenging. For example, a variety of measures based on income as well as health and social outcomes exists to measure a country's need (Coudouel, Hentschel and Wodon, 2002). But the challenge is in determining which of these measures best reflects the baseline against which some donors may choose to provide foreign aid. This paper uses natural disasters to determine a baseline level of need that could prompt a humanitarian response. Natural disasters, though not completely random as some places are more disaster-prone than others, do provide a shock of economic need to a given place and time. This shock creates variation in levels of demonstrated need based on the intensity of the disaster in a given location. But this shock of demonstrated need is not independent from the baseline economic and social needs in a given country. A major earthquake in a wealthier country like Japan, for example, prompts a different response than a major earthquake in a poorer country like Haiti. Instead, both the disaster impact as well as the baseline conditions in the affected country should contribute to a measure of need.

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[17]I include a recipient in all years if they received at least one funding appeal during the 18-year period.

The identification of an appropriate measure for bilateral strategic interests also poses a challenge. Most foreign aid research includes a variety of measures designed to capture various economic, security, or diplomatic linkages between the two nations. Thus, a typical analysis may include measures such as trade flows, alliances, UN voting, colonial heritage, or distance between the donor and recipient countries. Measuring each one separately, however, fails to capture the ways in which each of these components contributes to the overall bilateral strategic nature of the donor-recipient dyad.

Geopolitical influence is another concept that has several layers of complexity. A country may be influential in some combination of economic, security, or diplomatic arenas. While it is true that there is significant overlap for some countries (such as the United States), there are other instances where countries may have some influence in one area, but much less in another. For example, the United States has a large GDP and spends a significant share of its GDP on military expenditures (SIPRI, 2013). Other economically powerful countries, such as Japan and Germany, spend a smaller proportion of their GDP on military expenditures, making their influence based on security power less impactful than their influence based on economic power. In addition, while some countries have a permanent seat on the United Nations Security Council (UNSC), others have varying diplomatic leverage as they rotate on and off of the UNSC as temporary members. Thus, we need a measure that incorporates the impact of each of these distinct components on the overall geopolitical influence of the donor.

To evaluate the hypotheses, I require measures on all three concepts that reflect the influence of multiple characteristics and I need to reduce the number of variables included in the analysis in order to make substantively broad conclusions.[18] To accomplish these goals, I perform a principal component analysis (PCA) for each of the three concepts outlined above. The underlying strategy of PCA is "to reduce the dimensionality of a data set consisting of

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[18]Interacting all variables that contribute to geopolitical influence with all those that contribute to humanitarian need and strategic interests creates a challenge for a meaningful test of the first hypothesis. For example, what does the coefficient on the interaction between a seat on the UNSC and trade flows tell us about the overall conditioning effect of geopolitical influence and strategic interest on aid patterns?

a large number of interrelated variables, while retaining as much of the variation present in the data set" (Jolliffe, 2002). Using this procedure, I am able to retain the portion of each of the variables that contributes uniquely to the overall measures for geopolitical influence, strategic interest, and humanitarian need.

I use variables that relate to economic, security, and diplomatic spheres of influence to construct an overall geopolitical influence index for each donor in a given year. Donors with larger economies should have more influence in international affairs. To proxy for economic influence, I use the natural log of the GDP of a donor country (World Bank, 2012b). Militarily powerful donors should possess greater influence. I use the natural log of military expenditures and a dummy variable for whether or not the donor country is a nuclear power to measure this component (SIPRI, 2013). Diplomatically well-positioned donors should have a greater geopolitical influence. To account for this, I include a measure that is a dummy variable for years in which a donor is on the UNSC.[19] Finally, I assume that more populous countries are, all else equal, more influential than smaller ones, so I include the natural log of the population in the PCA (World Bank, 2012b).

Table 1 shows the principal component factors for geopolitical influence. Researchers use a variety of rules in choosing which factors to retain in the subsequent analyses. These range from rule-of-thumb measures based on the eigenvalue (keeping factors with eigenvalues greater than one) or cumulative percentage of the factors (e.g. keeping the top factors that combined account for more than 60% of the variance) to more complex statistical procedures or substantive reasons (e.g. keeping those top factors that can be related to theoretical concepts) (Jolliffe, 2002). Factor 1, with an eigenvalue of 3.92 is substantially larger than any other factor, contributing about 78% of the variance of the combined factors. Furthermore, there is a significant drop-off in the proportion of variance contributed by Factor 1 as compared to Factor 2. Thus, I will keep Factor 1 as a measure of geopolitical

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[19]Three countries (the United States, France, and the United Kingdom) are permanent members of the UNSC, while three countries (Australia, Finland, and Switzerland) are never members of the UNSC during this period.

influence. Table 2 shows the rotated factor loadings of each variable onto Factor 1. Military expenditures, followed closely by GDP and population, contribute the largest components to the measure of geopolitical influence. Both membership on the UN Security Council and possessing nuclear weapons contribute positively to Factor 1, but to a smaller extent than the other variables.

Table 1: Geopolitical Influence Principal Component Factors

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	3.92320	3.16687	0.7846	0.7846
Factor2	0.75634	0.49024	0.1513	0.9359
Factor3	0.26610	0.22950	0.0532	0.9891
Factor4	0.03660	0.01884	0.0073	0.9964
Factor5	0.01776	.	0.0036	1.0000

Table 2: Geopolitical Influence Rotated Factor Loadings

Variable	Factor1	Uniqueness
GDP (ln)	0.9428	0.1111
Military Expenditure (ln)	0.9668	0.0654
UNSC	0.7500	0.4375
Nuclear State	0.8116	0.3414
Population (ln)	0.9373	0.1215

After conducting the principal component analysis, I estimate predicted values for geopolitical influence for each donor-year. The scores are rescaled from 0 (least influential) to 1 (most influential). Table 3 provides a ranking of countries in 2009 on these geopolitical influence scores. Unsurprisingly, the United States ranks first in influence, with the highest score in the dataset. The next group of donors includes those with the largest economies and those with the strongest security and diplomatic influence (France, United Kingdom, Japan, and Germany). The least influential countries at the bottom of the list include those with smaller economies and with limited influence (relative to the top five) in security and

diplomatic affairs. The measure seems to capture the expected relative geopolitical influence of these donors.

Table 3: 2009 Geopolitical Influence Scores

Donor	Influence
United States	1.00
France	.73
United Kingdom	.73
Japan	.65
Germany	.49
Spain	.38
Canada	.37
Australia	.33
Netherlands	.28
Austria	.27
Belgium	.20
Sweden	.19
Switzerland	.18
Norway	.16
Portugal	.16
Denmark	.14
Finland	.11
New Zealand	.04

To construct a measure of humanitarian need, I consider both disaster impacts and baseline economic and social conditions. The data source used for disasters comes from the Emergency Events Database (EM-DAT), which is maintained by the World Health Organization (WHO) Collaborating Centre for Research on the Epidemiology of Disasters (CRED). This database tracks worldwide disasters and gathers information on the impact of each individual disaster. It includes information on more than 18,000 mass disasters that have occurred throughout the world since 1900 (CRED - Université Catholique de Louvain - Brussels, Belgium, 2012). I use the natural log of deaths in a recipient country-year to proxy the impact of the disaster. An increase in the death toll should indicate a larger humanitarian need in a recipient country. I also include measures of GDP per capita and infant mortality

to account for baseline economic and social need in each recipient country (World Bank, 2012*b*).

Table 4 shows the principal component factors for humanitarian need. Factor 1 contributes about 56% of the total variance to the model and is the only factor with an eigenvalue greater than 1. Furthermore, the second factor only explains about half as much of the variance as Factor 1 does, indicating a large break between the two factors. Thus, I will keep Factor 1 as my measure of humanitarian need. Table 5 shows how each variable loads onto Factor 1. GDP per capita has the largest loading and is negative, meaning that increases in per capita income negatively affect humanitarian need. Infant mortality has a positive loading that is similar in magnitude to GDP per capita. Finally, the impact of the disaster has a positive and slightly smaller contribution to Factor 1.

Table 4: Humanitarian Need Principal Component Factors

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	1.66709	0.85675	0.5557	0.5557
Factor2	0.81034	0.28777	0.2701	0.8258
Factor3	0.52257	.	0.1742	1.0000

Table 5: Humanitarian Need Rotated Factor Loadings

Variable	Factor1	Uniqueness
Per Capita GDP	-0.8092	0.3452
Infant Mortality	0.8018	0.3572
Deaths (Logged)	0.6079	0.6305

Table 6 provides a sample of recipient-years that rank highest on the humanitarian need scale. The scores are rescaled from 0 (least need) to 1 (most need). The countries on the list are primarily from sub-saharan Africa and score low on economic and health indicators (with the 2005 earthquake in Pakistan as a notable exception). The list shows a range of disaster impacts from 50 to 74,710 deaths. While the impact of the disaster factors into

the measure of need, the underlying economic conditions add greater weight to this score. Thus, it is unsurprising, for example, that the more economically advanced countries that each experienced thousands of deaths in the 2004 Indian Ocean Tsunami do not rank at the top of the humanitarian need scale. However, India, with its 18,000 deaths, and Indonesia, with its 167,000 deaths during this disaster, do score quite high on humanitarian need for 2004 (about .87 each). Thailand (.75) and Sri Lanka (.78) also have high scores for that year. In addition to the 2005 earthquake in Pakistan which is included in Table 6, the China earthquake in 2008 also scores very high on humanitarian need (.80). Thus, it seems that the composite measure for humanitarian need captures both disaster impacts as well as the underlying economic and social need for recipients.

Table 6: Humanitarian Need Scores

Year	Recipient	Deaths	Score
1992	Mozambique	587	1.00
1996	Sierra Leone	518	.99
1996	Nigeria	5913	.98
1999	Sierra Leone	366	.98
1995	Niger	3022	.97
1994	Mozambique	240	.97
1992	Sierra Leone	100	.96
2000	Sierra Leone	188	.96
1997	Sierra Leone	121	.96
1997	Mozambique	672	.96
1992	Guinea	356	.96
1993	Mozambique	102	.96
1998	Sierra Leone	125	.96
2002	Democratic Republic of Congo	2875	.95
1997	Mali	1098	.95
2005	Pakistan	74710	.95
1998	Nigeria	1446	.95
1996	Liberia	56	.95
1995	Sierra Leone	50	.95
1992	Nigeria	601	.94

To measure bilateral strategic interests, I consider economic, security, and diplomatic

ties. For economic interests, I include the natural log of the combined exports and imports between donor i and recipient j in year t (Barbieri, Keshk and Pollins, 2009; Barbieri and Keshk, 2012). For security interests, I include the variable *alliance*, which denotes the total number of alliance agreements in force between i and j in year t (Gibler, 2009).[20] Both alliances and trade flows between the two countries are expected to increase the strategic interests for the donor. To proxy diplomatic ties, I include a variable that identifies the degree of similarity in voting patterns in the United Nations General Assembly (Strezhnev and Voeten, 2012). The variable ranges from -1 (no similar votes) to 1 (identical voting patterns). The relationship between UN voting patterns and the distribution of aid should be negative, indicating a desire to provide aid in exchange for buying votes in the UN General Assembly from those with dissimilar voting patterns (Fink and Redaelli, 2011; Raschky and Schwindt, 2012).

Table 7 displays the principal component factors for strategic interest. Factor 1 contributes nearly 50% of the variance, while Factors 2 and 3 contribute roughly 25% each. Furthermore, Factor 1 is the only factor with an eigenvalue greater than 1. I will keep Factor 1 as my measure of strategic interest. Table 8 shows the rotated factor loadings onto Factor 1 for each variable. Both trade and alliance contribute fairly equally to Factor 1. The UN affinity index contributes negatively to the component, which is consistent with the idea mentioned above that negative relationships in UN voting affinity may afford a strategic opportunity to buy votes.

Based on a sample of rank-ordering of recipients for the United States, this composite measure seems to capture the concept of bilateral strategic interest well. Table 9 displays a sample of recipients with high scores on strategic interest for the United States of America in 2009. The scores are rescaled from 0 (least strategic) to 1 (most strategic). The most strategic recipient for the US is Mexico, who is one of America's largest trading partners, shares three

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[20]Re-estimating the models using a dummy variable for alliances instead of a count of alliances yields nearly identical results. See Table 12 in the Appendix for a list of 2009 strategic interest scores for the United States and Table 13 for the results of the same analysis used in Table 10, but using the alliance dummy variable instead of the count of alliances.

Table 7: Strategic Interest Principal Component Factors

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	1.36637	0.50274	0.4555	0.4555
Factor2	0.86362	0.09361	0.2879	0.7433
Factor3	0.77001	.	0.2567	1.0000

Table 8: Strategic Interest Rotated Factor Loadings

Variable	Loading	Uniqueness
Trade	0.7075	0.4995
Alliance	0.7036	0.5049
UN Voting	-0.6089	0.6292

military alliances and does not vote similarly to the US in the UN General Assembly. The rest of the list primarily consists of Latin American countries that trade heavily with the US, share multiple military alliances, and have UN voting patterns quite dissimilar to those of the US. Other countries of notable bilateral strategic interest to the United States in 2009 with relatively high scores on this measure include large trading partners such as India (.58) and China (.64) as well as key security allies such as Pakistan (.64) and South Korea (.75).

I construct a time-series cross-section dataset of disaster aid with donor-recipient dyads from 1992-2009. Recent literature on foreign aid giving identifies a change in the strategic nature of foreign aid disbursal following the end of the Cold War and much subsequent work attempts to account for this change in behavior (Dunning, 2004; Bearce and Tirone, 2010). Limiting the data to the post-Cold War period avoids this confounding influence. I also limit the donors in the sample to 18 members of the Development Assistance Committee (DAC) of the Organization for Economic Cooperation and Development (OECD). These countries are the largest providers of relief aid and are among the most geopolitically influential countries in the world.

Table 9: Strategic Interest Scores for the USA in 2009

Recipient	Score	Trade (ln)	Alliance	UN Voting
Mexico	.95	12.62	3	-.51
Venezuela	.94	10.57	3	-.78
Turkey	.93	9.43	4	-.18
Brazil	.92	10.67	3	-.65
Colombia	.90	9.98	3	-.64
Ecuador	.89	9.13	3	-.73
Trinidad and Tobago	.88	8.96	3	-.65
Dominican Republic	.87	9.10	3	-.63
Chile	.87	9.53	3	-.52
Guatemala	.87	8.94	3	-.60
Costa Rica	.86	9.27	3	-.54
Nicaragua	.86	7.77	3	-.78
Argentina	.86	9.14	3	-.54
Peru	.86	9.10	3	-.53
El Salvador	.85	8.41	3	-.62

The Models

To test the effects of geopolitical influence, bilateral strategic interest, and humanitarian need on the share of aid provided, I estimate the following ordinary least squares (OLS) regression with donor and year fixed effects:[21]

$$aidshare_{ijt} = \beta_0 + \beta_1 influence_{it} + \beta_2 humanitarian_{jt} + \beta_3 strategic_{ijt-1} +$$

$$\beta_4 influence_{it} * humanitarian_{jt} + \beta_5 influence_{it} * strategic_{ijt-1} + \alpha_i + \gamma_t + \epsilon \quad (1)$$

where *aidshare* is the share of donor i's yearly aid budget provided to recipient j in year t; *influence*, *humanitarian*, and *strategic* are the measures derived from the principal component analysis described above, with *strategic* entering the model at year *t-1* to account for potential endogeneity between strategic interest and aid provision (e.g. aid provided in year t could affect the levels of trade or UN voting in year t); α is a fixed effect term for donor i; γ is a fixed effect term for year t; and ϵ is the error term. The first hypothesis

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[21]I limit my analysis to donor-years where some relief aid budget exists.

predicts that β_2 will be positive, while β_4 will not be significantly different than zero. The second hypothesis predicts that β_3 will be positive and β_5 will be negative.

To test the effect of geopolitical influence on the probability of giving to a recipient, I estimate the following logistic regression with year fixed effects:[22]

$$Pr(aid_{ijt} = 1|X) = \phi(\beta_0 + \beta_1 influence_{it} + \beta_2 humanitarian_{jt} + \beta_3 strategic_{ijt-1} + \gamma_t + \epsilon)$$

(2)

where *aid* is a dummy variable that takes the value of 1 when donor i provides relief aid to recipient j in year t and 0 otherwise; *influence*, *humanitarian*, and *strategic* are the measures described above, with *strategic* entering the model at time *t-1*; γ is a fixed effect term for year t; and ϵ is the error term. The third hypothesis predicts that β_1 will be positive.

2.5 RESULTS

Table 10 provides the estimates from Equation 1. The first hypothesis states that all donor types will increase the share of their relief aid budgets when humanitarian need increases. Model 1 shows the results from an OLS model with year and donor fixed effects. Model 2 includes a lagged dependent variable to control for temporal dependence among the donor-recipient dyads. In both models, the coefficient on humanitarian need is positive and statistically significant. Furthermore, the coefficient on the interaction term between humanitarian need and geopolitical influence is not statistically significant from zero. The graph on the right side of Figure 4 (derived from Model 2) shows the marginal effect of humanitarian need on the share of annual disaster aid expenditures at varying levels of geopolitical influence. For all donor types, the marginal effect of humanitarian need on the share of aid provided is positive and statistically significant. Furthermore, the slope of the marginal effect line is virtually flat. These results indicate that donors of all types respond similarly to increases

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[22]Beck and Katz (2001) argue against using entity fixed effects in a logistic regression for a time-series-cross-section dataset when the probability of success is rare, as is the case in much international relations literature. Since the probability of providing relief aid in this dataset only occurs in about 5% of the observations, I do not include donor fixed effects in the analysis.
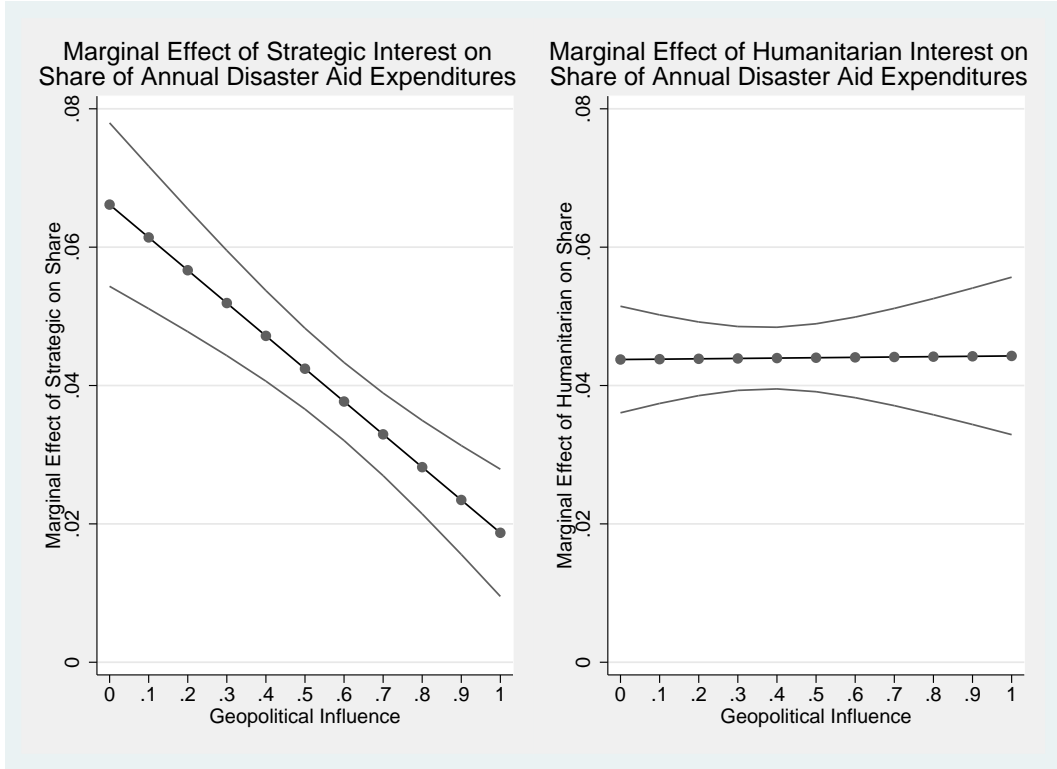
Figure 4: Interest and Aid Share

in the humanitarian need of a given recipient, which provides evidence confirming the first hypothesis.

The second hypothesis states that the marginal effect of strategic interests on the share of the aid budget provided will be higher for low influential donors than for high influential donors. This implies that the interaction term for geopolitical influence and strategic interest should be negative. Across all model specifications in Table 10, the interaction term is negative and statistically significant at $p<$ .01. This provides evidence that low influential donors respond to increases in bilateral strategic interest by providing a greater share of relief aid than high influential donors. The graph on the left-hand side of Figure 4 shows the marginal effect of strategic interest on the share of aid provided. The lower confidence interval of the marginal effect line remains above zero across all levels of influence, indicating that both low and high influential donors respond positively to strategic interests. The effect of strategic interest on aid share for low influential donors, however, is higher than

Table 10: Geopolitical Influence and Disaster Aid Share

	(1) Aid Share OLS	(2) Aid Share OLS	(3) Aid Share OLS	(4) Aid Share OLS	(5) Aid Share GLM
Geopolitical Influence	0.0073	0.0066	0.0049	0.0067	−0.1219
	(0.0098)	(0.0098)	(0.0114)	(0.0098)	(1.7694)
Strategic Interest$_{t-1}$	0.0680***	0.0662***	0.0662***	0.0663***	8.4947***
	(0.0060)	(0.0060)	(0.0080)	(0.0061)	(0.4851)
Humanitarian Interest	0.0448***	0.0438***	0.0434***	0.0437***	10.6688***
	(0.0040)	(0.0039)	(0.0043)	(0.0039)	(0.7053)
Influence*Strategic	−0.0491***	−0.0474***	−0.0466**	−0.0478***	−3.6657***
	(0.0090)	(0.0090)	(0.0186)	(0.0090)	(0.9425)
Influence*Humanitarian	−0.0001	0.0005	0.0021	0.0006	1.0034
	(0.0086)	(0.0086)	(0.0110)	(0.0086)	(1.4721)
Share of Disaster Aid$_{t-1}$		0.0190*	0.0174	0.0190*	0.7045*
		(0.0106)	(0.0110)	(0.0106)	(0.4045)
Annual Relief Expenditures				0.0000	
				(0.0000)	
Constant	−0.0402***	−0.0392***	−0.0284***	−0.0396***	−15.9798***
	(0.0088)	(0.0088)	(0.0034)	(0.0088)	(1.4499)
Includes US	Yes	Yes	No	Yes	Yes
N	40656	40074	37640	40074	40074

(1) All models include robust standard errors, donor fixed effects and year fixed effects.

(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

for highly influential donors, indicating a greater response to increases in strategic links for low influential donors. When a donor shifts from high to low geopolitical influence, the annual share of aid provided to a highly strategic recipient increases by about 5%. These results indicate an aid strategy more targeted toward bilateral strategic interests for low influential donors as compared to high influential donors, thus providing evidence for the second hypothesis.

Models 3-5 provide robustness tests for the fully specified model in column 2. As an extreme outlier on the geopolitical influence score, we might be concerned that observations for the United States as a donor are disproportionately affecting the final results. Model 3 is the same as Model 2 except for the exclusion of all observations in which the US is a donor. The results from Model 2 are robust to the exclusion of the United States in Model 3.

Model 4 controls for the total relief aid expenditures of donor i in year t. Several of the countries with higher levels of geopolitical influence are also some of the largest donors in the sample. The United States, for example, consistently ranks first in both geopolitical influence scores and annual relief aid expenditures across the years included in the sample. Thus, we might be concerned that the measure of geopolitical influence is simply a proxy for the size of the relief budgets. If that were the case, then the size of the budget (and not geopolitical influence) would explain the different aid strategies. Some countries such as Norway and Sweden, however, possess very low scores on geopolitical influence $(< .2)$, yet consistently rank in the top five donors in terms of relief aid expenditures in any given year. Thus, it may not be the case that geopolitical influence is a simple proxy for relief aid expenditures.[23] The coefficient on the size of the relief aid expenditures in Model 4 is small and statistically insignificant. More importantly, however, the results in column four remain robust to the inclusion of this term. This provides greater confidence that geopolitical influence, and not merely the size of the aid budgets, is driving the results.

Finally, Model 5 presents the estimates from a fractional logistic regression model. The

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[23]The measures of geopolitical influence and the size of the relief aid budget for donor i in year t have a positive correlation of .42.

dependent variable, *aidshare*, is a proportion that ranges from 0 to 1, inclusive. Estimating OLS with a dependent variable that is a proportion can result in predicted values that fall outside this range and Papke and Wooldridge (1996) propose an alternative generalized linear model (glm) approach to address this issue. The estimates in column five are substantively similar to those found in the first four columns. When compared to high influential donors, low influential donors respond to increases in bilateral strategic interest by providing a larger share of their relief aid budgets.

The following examples illustrate the way in which geopolitical influence results in different aid strategies. In 1999, both Turkey and Venezuela experienced major natural disasters. The earthquake in Turkey killed an estimated 18,000 people, while the floods in Venezuela resulted in more than 30,000 deaths (CRED - Université Catholique de Louvain - Brussels, Belgium, 2012). Turkey had a slightly higher GDP per capita than Venezuela ($5800 vs. $5200) while Venezuela had a slightly lower infant mortality rate (19 vs. 32). Both had humanitarian need scores in 1999 of about .77. Denmark, a low influential donor with a score of .14 (on a 0 to 1 scale), had a high strategic interest score vis-a-vis Turkey (.53) based primarily on significant trade and the existence of three military alliances between the two countries at that time. By contrast, Denmark had a moderately low strategic interest score with Venezuela (.18). Predicted values from the model suggest a statistically significant 2% increase in the share of Denmark's 1999 relief aid budget given to Turkey compared with Venezuela. The predicted value actually underestimates the true difference between the share of annual aid expenditures provided by Denmark in 1999 to the two countries, which was a difference of 12%. This provides an example of the targeting of aid toward recipients where the donor has key bilateral strategic interests. Denmark had the opportunity to provide aid to two countries similar in humanitarian need, but different in strategic interest. Denmark chose to target the country with much higher strategic interest by providing a greater share of its aid budget.

In a counterexample, we can see how a highly influential donor provides similar amounts

to countries with large differences in strategic interests. In 1995, the Ukraine and Turkey had small-scale disasters with several hundred deaths each (CRED - Université Catholique de Louvain - Brussels, Belgium, 2012). The two countries had similar humanitarian scores of about .70 in 1995. Turkey had a significantly higher per capita GDP ($5400 versus $1300) while Ukraine had a lower infant mortality rate (18 versus 43). The United States had a high strategic interest in Turkey with a score of .89, based primarily on the existence of four alliances between the two countries and a moderately high level of trade flows. The US, however, had a moderate strategic interest in Ukraine with a score of .39. Predicted values from the model suggest no statistically significant difference between the aid shares provided to the two countries. The actual giving patterns conform to these predictions. Each country receives about 2% of the aid budget from the US in 1995. In this example, the US provides similar shares of its aid budget to two countries at very different levels of strategic interest. This approach is more in line with the strategy of highly influential donors, in which they provide relief aid to many places to signal their humanitarianism, with less of an emphasis on bilateral strategic interests.

The third hypothesis states that donors at high levels of geopolitical influence are more likely to provide relief aid following a disaster, regardless of either strategic or humanitarian interest. Table 11 provides results from the estimation of Equation 2, which tests the third hypothesis. These results provide consistent evidence that greater geopolitical influence increases the likelihood of providing relief aid to a given country. The coefficient on geopolitical influence is positive and statistically significant across all models in Table 11. Model 6 includes strategic interest and humanitarian need as control variables, while Model 7 adds the lagged dependent variable to control for potential endogeneity issues between strategic interest and the likelihood of providing aid. The estimates for Model 7 indicate that a highly influential donor is nearly 70% more likely to provide relief aid to a given recipient following a disaster as compared to a low influential donor. The results remain robust to the exclusion of the United States in Model 8. Finally, Model 9 includes total annual relief

aid expenditures for donor i in year t as a control variable. It might be the case that geopolitical influence is simply a proxy for the size of the aid budget. The coefficient for annual relief expenditures is substantively small, but statistically significant at p< .1. However, the main result is robust to the inclusion of the term for annual relief expenditures, indicating that geopolitical influence, and not the size of the aid budget, better explains the likelihood of providing disaster relief aid. Even after controlling for strategic interest, humanitarian need, and the size of the relief aid budget, the results suggest that donors with high levels of geopolitical influence are much more likely to provide relief aid following a disaster as compared to donors with low levels of geopolitical influence, thus providing evidence for the third hypothesis.

The aid distribution patterns of several highly influential donors provide additional evidence to support these claims. In any given year, the United States provides smaller shares of its aid budget to a dozen or more countries around the world, while providing a large share of the aid budget to the most devastated countries.[24] In 1994, for example, the US gave the same amount of relief aid to ten countries, with each receiving just more than 1% of the budget that year.[25] These countries vary dramatically in the extent to which bilateral strategic interests might influence donation patterns, ranging from recipients such as Mozambique that score moderately low on the strategic interest scale (.34) to recipients in Latin America that trade heavily with the US, participate in several military alliances, and score relatively high on strategic interest ($>$ .75). The relief aid distribution pattern of the United Kingdom is similar to that of the United States. In 1997, for example, the UK provided 19 countries with less than 2% each of its annual relief aid budget.[26] Also, these countries vary dramatically in their level of strategic interest with the U.K. Consistent with

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[24]This pattern of giving the largest share of the aid budget to the most devastated countries is consistent across the donors. Consistent with the statistical analysis presented above, all donors respond fairly equally to humanitarian need.

[25]The ten countries are Algeria, China, Egypt, Haiti, Indonesia, Moldova, Mozambique, Papua New Guinea, Peru, and St. Lucia.

[26]These 19 countries include Azerbaijan, Armenia, Bolivia, Chile, Czech Republic, Ecuador, Guyana, Madagascar, Malawi, Malaysia, Myanmar, Nicaragua, Paraguay, Peru, Poland, Romania, Tonga, Venezuela, and Vietnam

Table 11: Geopolitical Influence and Probability of Providing Disaster Aid

	(6) Pr(aid= 1 | X) Logit	(7) Pr(aid=1 | X) Logit	(8) Pr(aid=1 | X) Logit	(9) Pr(aid= 1 | X) Logit
Geopolitical Influence	0.5401***	0.5142***	0.7943***	0.4522***
	(0.0962)	(0.0976)	(0.1115)	(0.1056)
Strategic Interest$_{t-1}$	3.1808***	2.9244***	3.6782***	2.8972***
	(0.1581)	(0.1643)	(0.1953)	(0.1648)
Humanitarian Interest	6.8838***	6.6935***	6.7217***	6.6922***
	(0.1699)	(0.1716)	(0.1817)	(0.1716)
Disaster Aid Dummy$_{t-1}$		0.8742***	0.9459***	0.8719***
		(0.0643)	(0.0685)	(0.0644)
Annual Relief Expenditures				0.0000*
				(0.0000)
Constant	−8.7843***	−8.6310***	−8.7589***	−8.5989***
	(0.1743)	(0.1748)	(0.1851)	(0.1756)
Includes US	Yes	Yes	No	Yes
N	42055	42055	39621	42055

(1) All models include robust standard errors and year fixed effects.

(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

the hypotheses outlined above, these highly influential donors appear more likely and willing than donors with low levels of geopolitical influence to provide relief aid to non-strategic recipients.

2.6 CONCLUSION

Why do some donors choose to provide relief aid to seemingly non-strategic recipients? I argue that some (but not all) donors provide aid for the purpose of signaling their humanitarianism to the broader international community. This signaling action improves the reputation of the donor vis-a-vis these non-affected countries, which are future bargaining partners across a range of multilateral policy issues. The benefits gained via an improved reputation, however, depend on the geopolitical influence of the donor providing the relief aid. Donors with a high level of geopolitical influence benefit more from signaling humanitarianism (as compared to donors with low levels of geopolitical influence) due to their broader range of multilateral policy negotiations. Thus, they are more likely to provide relief aid to non-strategic recipients, while donors with low levels of geopolitical influence are more likely to provide relief aid based primarily on bilateral strategic links. Using a principal component analysis, I construct measures for donor geopolitical influence, bilateral strategic interest and recipient humanitarian need and test this theory on a dataset of disaster relief aid from 1992-2009. The results provide strong evidence that geopolitical influence conditions the relief aid strategies chosen by donors.
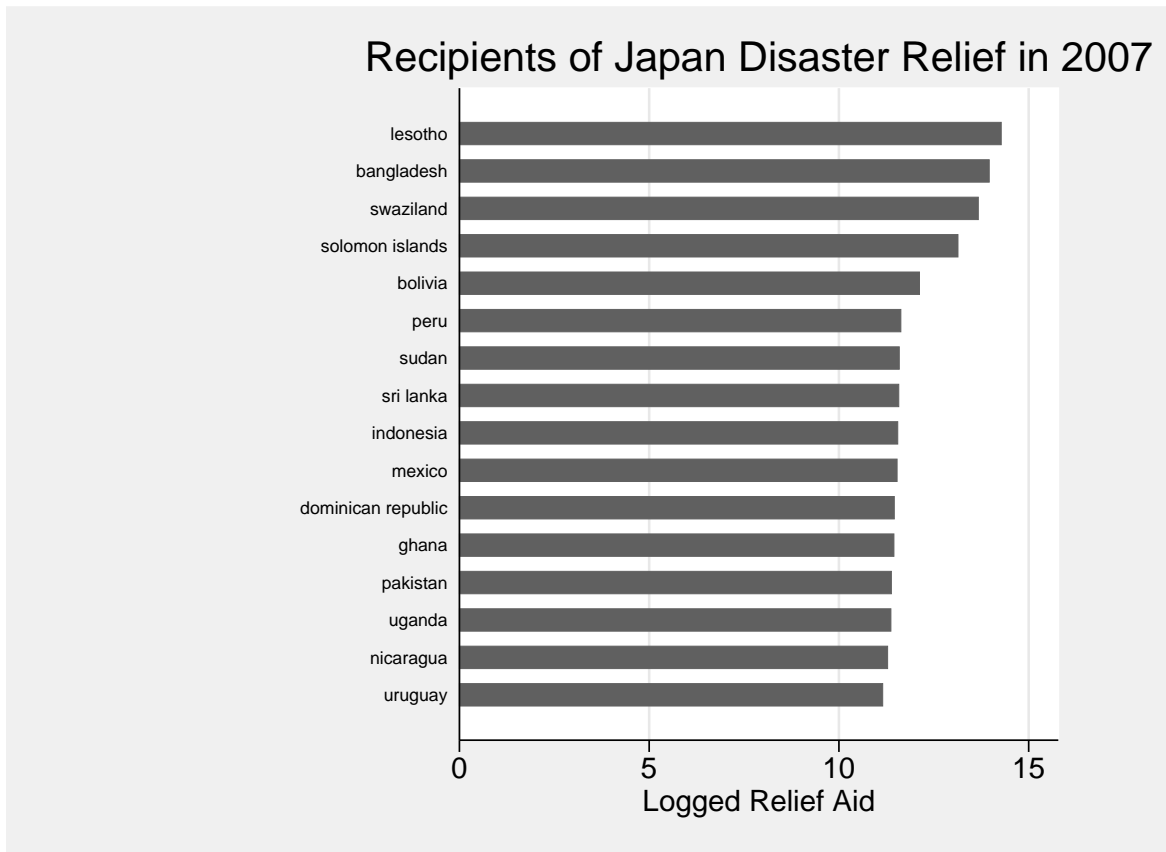
Figure 5: Recipients of Japan Disaster Relief in 2007

Table 12: Strategic Interest Scores for the USA in 2009 (with alliance dummy)

Recipient	Score	Trade (ln)	Alliance (dummy)	UN Voting
Mexico	.95	12.62	1	-.51
Venezuela	.94	10.57	1	-.78
Brazil	.92	10.67	1	-.65
Colombia	.90	9.98	1	-.64
Ecuador	.89	9.13	1	-.73
Philippines	.88	9.44	1	-.65
Pakistan	.88	8.54	1	-.75
Trinidad and Tobago	.87	8.96	1	-.65
Dominican Republic	.87	9.10	1	-.63
Chile	.87	9.53	1	-.52
Guatemala	.86	8.94	1	-.60
Costa Rica	.86	9.27	1	-.54
Nicaragua	.86	7.77	1	-.78
Argentina	.86	9.14	1	-.54
Peru	.86	9.10	1	-.53

Table 13: Geopolitical Influence and Disaster Aid Share (with alliance dummy)

	(1) Aid Share OLS	(2) Aid Share OLS	(3) Aid Share OLS	(4) Aid Share OLS	(5) Aid Share GLM
Geopolitical Influence	0.0075	0.0068	0.0069	0.0070	0.5576
	(0.0100)	(0.0099)	(0.0112)	(0.0099)	(1.7168)
Strategic Interest$_{t-1}$	0.0680***	0.0662***	0.0691***	0.0664***	8.5788***
	(0.0062)	(0.0062)	(0.0079)	(0.0062)	(0.4827)
Humanitarian Interest	0.0449***	0.0438***	0.0435***	0.0438***	10.7960***
	(0.0040)	(0.0039)	(0.0043)	(0.0039)	(0.6949)
Influence*Strategic	−0.0493***	−0.0476***	−0.0562***	−0.0479***	−4.4025***
	(0.0100)	(0.0099)	(0.0174)	(0.0099)	(0.9457)
Influence*Humanitarian	−0.0004	0.0003	0.0017	0.0003	0.3910
	(0.0086)	(0.0086)	(0.0109)	(0.0086)	(1.3848)
Share of Disaster Aid$_{t-1}$		0.0189*	0.0173	0.0189*	0.6567
		(0.0106)	(0.0110)	(0.0106)	(0.4146)
Annual Relief Expenditures				0.0000	
				(0.0000)	
Constant	−0.0404***	−0.0394***	−0.0288***	−0.0398***	−16.0100***
	(0.0088)	(0.0088)	(0.0034)	(0.0088)	(1.4466)
Includes US	Yes	Yes	No	Yes	Yes
N	40656	40074	37640	40074	40074

(1) All models include robust standard errors, donor fixed effects and year fixed effects.

(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Chapter 3

Disasters, Donors, and Democracy: Matching Donor Types and Aid

Channels in Disaster Relief

3.1 INTRODUCTION

Many researchers argue that the presence or absence of democratic institutions in the recipient country affects the probability and level of foreign aid disbursals by a donor country. Analysis differs, however, on the expected effect (positive or negative) of these democratic institutions on the disbursal of aid. Some argue that the presence of democratic institutions such as rule of law should encourage an increase in aid flows directly to the recipient country. For example, Fink and Redaelli (2011) argue that the presence of democratic institutions will ensure that bilateral aid will be funneled to those in need by helping to "facilitate and encourage the provision of foreign emergency aid." Furthermore, many adhere to the notion that aid can be more effective in the presence of democratic institutions, which is an idea that should prompt donors to funnel more aid to these recipients (Svensson, 1999; Burnside and Dollar, 2000; World Bank, 1998). These scholars find evidence for this type of donor giving in empirical results using both official development aid as well as post-disaster relief aid flows (Alesina and Dollar, 2000; Raschky and Schwindt, 2012). Other empirical results, however, show no effect of recipient country democratic institutions on the disbursal of post-disaster aid (Fink and Redaelli, 2011).

Another group of scholars argues that the presence of democratic institutions may actually hinder the underlying strategic purposes of foreign aid. Bueno de Mesquita and Smith (2009) theorize that donor governments provide aid in exchange for policy concessions from the recipient government's leaders. Certain leaders, who rely on small coalitions and fewer democratic institutions, are better strategic targets for donor governments since these leaders are better able to divert these funds to themselves or their political cronies in exchange for a given policy concession.[27] The presence of more democratic institutions in a recipient country, therefore, should result in a decrease in the probability and amount of aid provided by donor countries. Although Bueno de Mesquita and Smith present a detailed formal model in support of this theory, their empirical results using official development aid suggest that the presence of a large coalition government in a recipient country has no significant effect on the likelihood of providing official development aid. Other empirical results, however, have supported their theory by showing a significant negative effect of recipient country democratic institutions on the disbursal of official development aid (Alesina and Weder, 2002).

This paper argues that the competing theoretical predictions and empirical results in the literature stem from neglecting to account for heterogeneity in the preferences of donors in their disbursal of aid. Donors who give for humanitarian reasons prefer to provide bilateral aid to democratic recipients who they believe will help facilitate the disbursal of aid according to the true needs of their citizens. Conversely, donors who give for strategic reasons prefer to give bilateral aid to less democratic recipients who they believe are more likely to provide policy concessions in exchange for aid. This paper uses a dataset of post-disaster aid disbursals in 213 worldwide disasters from 1992-2001 to distinguish between donor types based on their level of responsiveness to need. The *responsiveness* measure reveals donor preferences on a continuum of mostly strategic to mostly humanitarian reasons for providing disaster relief. Once donors are identified according to type, the paper uses a second data set of 272 worldwide disasters from 2002-2009 to test whether different donor types channel

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[27]See Heinrich (2013) for a challenge to a purely concessional view of aid.

aid (bilaterally or multilaterally) based on the presence or absence of democratic institutions in a recipient country.

This project makes two distinct contributions. The first contribution is the demonstration of how donors react differently to the devastation associated with natural disasters. Specifically, the paper develops a metric that identifies the effect of the disaster impact on the amount of giving by a particular donor, while controlling for strategic reasons to donate. This *responsiveness* measure provides a way to differentiate donors based on their revealed preferences (humanitarian vs. strategic) for providing disaster relief. The second contribution of this project is the identification of how the responsiveness level of states impacts their decision to provide aid via different aid channels and to different recipient types (based on level of democracy). The results suggest that more democratic institutions in recipient countries increase the bilateral proportion of total aid given by donors who are highly responsive to disasters, while the same level of democratic institutions reduces the bilateral proportion of total aid given by donors who have low levels of humanitarian responsiveness to disasters.

The chapter proceeds as follows. Section 3.2 reviews the current literature on the determinants of foreign aid giving while section 3.3 presents a theory of post-disaster donor giving based on donor types and aid channels. The final three sections in this chapter outline the research design, present the results, and conclude.

3.2 FOREIGN AID & DISASTERS

Foreign aid research has focused on whether strategic or humanitarian motivations dominate aid disbursal decisions. While humanitarian motivations certainly play a role, much of the research to date suggests that strategic interests between the donor and recipient country dominate the motivation for giving. Scholars have argued that bilateral trade (Schraeder, Hook and Taylor, 1998; Meernik, Krueger and Poe, 1998; Berthelémy and Tichit, 2004; Bueno de Mesquita and Smith, 2007, 2009), security alliances (Schraeder, Hook and Taylor, 1998; Meernik, Krueger and Poe, 1998; Bueno de Mesquita and Smith, 2007, 2009), open

market access (Meernik, Krueger and Poe, 1998; Alesina and Dollar, 2000), seats on the UN Security Council (Kuziemko and Werker, 2006), similarities in UN voting patterns (Alesina and Dollar, 2000), and colonial relationships (Schraeder, Hook and Taylor, 1998; Alesina and Dollar, 2000; Berthelémy and Tichit, 2004; Bueno de Mesquita and Smith, 2009) are the driving force behind aid-giving patterns. Even in the context of humanitarian relief aid, strategic interests weigh heavily in the aid distribution decisions of donors (Fink and Redaelli, 2011; Raschky and Schwindt, 2012).

Whether looking at official development aid or humanitarian aid, most of the empirical literature on foreign aid practices has assumed homogenous preferences for aid donors. Schraeder, Hook and Taylor (1998) were an early exception to this trend by comparing the determinants of foreign aid giving among the American, Japanese, French and Swedish governments separately. Using official development aid in their empirical analysis, they argued that each government had a unique strategic focus that drove its foreign policy agenda. Similarly, Fink and Redaelli (2011) analyzed the individual determinants of providing post-disaster humanitarian aid for five of the largest donors and found some differences in the key determinants of aid disbursals. Berthelémy (2006) compares across a range of donors and finds allocation patterns that span the altruistic to egoistic continuum, but does not provide a theoretical basis for these differences. Overall, the foreign aid literature either assumes all donors are homogenous in their motivations, provides case studies of a few donors with different explanations for each, or shows empirical differences in motivations without developing an accompanying theory to explain these differences. This paper seeks to address this gap by focusing on measuring revealed donor preferences for foreign aid.

Determining how to measure the preferences of donors is a challenge for researchers. One such metric used to compare the generosity of donors is simply the amount of foreign aid provided as a percentage of the donor nation's gross national product. By this measure, the United States, by far the largest overall donor of foreign aid, ranks near the bottom of the Organisation for Economic Co-operation and Development (OECD) donors while Sweden

ranks first (OECD, 2012). This measure, however, does not reflect the response of a given country to the level of need in a recipient country. A variety of measures based on income as well as health and social outcomes exists to measure a country's need (Coudouel, Hentschel and Wodon, 2002). But the challenge is in determining which of these measures best reflects the baseline against which some donors may choose to provide foreign aid.

This paper uses natural disasters to determine a baseline level of need that could prompt a humanitarian response. If donor governments donate disaster aid based on need, then we should see a strong correlation between high levels of devastation and large levels of aid provided for that disaster. This paper uses the effect of disaster impact on post-disaster humanitarian aid giving for each individual OECD donor country as a measure of the overall level of *responsiveness* to need for that donor. This concept of responsiveness refers to the empirical reality of how governments provide funding for varying levels of humanitarian need, controlling for their strategic interests in those recipient countries. As the impact of a disaster increases, a donor country that scores high on this responsiveness measure would provide a larger amount of aid than a donor country that scores low on this measure, while controlling for strategic giving. This measure of responsiveness is used to parse out donor types by distinguishing between the aid preferences of each of the donors. Thus, a high responsive donor would be more humanitarian in its giving preferences while a low responsive donor would be more strategic in its giving preferences.

In addition to deciding whether or not to respond to a crisis, donors have to decide through which channel (e.g. bilaterally or multilaterally) to provide the post-disaster aid. In making this calculation, donors must determine the extent to which they are providing aid for humanitarian or strategic purposes and the likelihood that the aid provided could be used to achieve their preferred goals. Boone (1996) argues that, for some countries, official development aid is highly fungible and may be used by the recipient country for alternative purposes. The extent to which foreign aid may be channeled into other purposes may depend on the level of democracy in the recipient country as reflected in the size of

the winning coalition (Bueno de Mesquita and Smith, 2009). Raschky and Schwindt (2012) argue that the presence of democratic institutions such as the rule of law should encourage countries to provide more disaster aid bilaterally, since the aid has a better chance of flowing to the disaster victims. But if a donor wants to use the aid strategically, then the presence of more democratic institutions in a recipient country may be a hindrance to the foreign policy desires of the donor country (Bueno de Mesquita and Smith, 2009). This paper uses the responsiveness of donor countries to disasters and their choice of channels to determine the conditions under which the presence of democratic institutions has either a positive or a negative effect on providing aid directly to recipient country governments. The following section outlines the theory and offers empirical predictions.

3.3 DONOR TYPES & AID CHANNELS

Following a natural disaster, the donor government provides some level of resources to help citizens of another country in their natural disaster response. The donor government has three potential actions: 1) whether or not to provide post-disaster aid in a given disaster situation; 2) if they choose aid, the amount of aid to provide to the recipient country; and 3) if they choose aid, the channel through which to provide aid to the victims of a disaster in a given country. The donor country has two main objectives in this process: 1) to reduce the level of suffering following a disaster; and 2) to obtain policy concessions from the national government leader in exchange for disaster aid distribution. The ability to reduce the level of suffering following a disaster depends on selecting the most effective distribution channel to ensure that the citizens with the most need receive the most help. Maximizing policy concessions also involves the strategic selection of distribution channels and depends on the ability of the national government leader to divert funds for political purposes.

Following a disaster, donor governments balance both humanitarian and strategic considerations to determine their optimal level of humanitarian aid to provide to a recipient government. Donors, however, vary in the extent to which humanitarian or strategic goals

dominate their aid allocation decision-making process. While Bueno de Mesquita and Smith (2009) provide insight into the exchange of aid for policy concessions, the authors fail to distinguish the extent to which governments distribute aid based on humanitarian versus strategic concerns and the extent to which they expect policy concessions in return. The authors assume that all donor countries focus exclusively on extracting policy concessions. In contrast, those that argue for a humanitarian view of giving fail to account for the ways in which democratic institutions may hinder the strategic benefits in providing relief aid. In a disaster situation, donors may balance their desire to respond to those in need with their desire to extract policy concessions from the recipient country government and this mix of motives is likely to vary across countries.[28]

Depending on the type of donor government (humanitarian or strategic), the decision of which channel through which to provide post-disaster aid (either via the recipient government or multilaterally) may be different. Strategic governments have a low level of responsiveness to the impact of natural disasters. Higher levels of need following a disaster have little or no effect on the amount of disaster aid provided, after controlling for strategic motivations $\left(\frac{\partial aid}{\partial deaths} \simeq 0 \right)$. Humanitarian donors, conversely, have a high level of responsiveness to the impact of natural disasters. The greater the impact of the disaster, the more disaster aid these governments provide, while controlling for their strategic motivations $\left(\frac{\partial aid}{\partial deaths} > 0 \right)$.

The fungibility of aid and its potential translation into policy concessions can make a nondemocratic recipient a more attractive channel for low responsive donors, but a less attractive channel for donors with high responsiveness who are concerned that their disaster aid may not reach the intended victims. These high responsive, humanitarian donors may be more interested in providing post-disaster aid for these recipient countries to NGOs as these organizations are more likely to distribute the disaster aid to the most affected victims. In these weakly democratic or nondemocratic environments, circumventing the power

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[28]For an empirical analysis of differing motivations for aid giving by donor countries, see Schraeder, Hook and Taylor 1998. For a formal model of the conditions under which a donor balances strategic and humanitarian motivations when providing foreign aid, see Heinrich (2013).

structures in society (by channeling aid away from the government) can provide a more optimal allocation of resources targeted at the citizens most in need in a disaster situation (Albala-Bertrand, 1993; Dietrich, 2013).

In contrast, in recipient countries with more democratic institutions, high responsive donors may be more likely to provide aid directly to the recipient government since they believe leaders in these countries are less likely to divert relief aid from those in need. Low responsive donors, however, are less inclined to provide bilateral aid to more democratic governments as this would reduce their chances for obtaining policy concessions in exchange for providing aid. This leads to the following hypotheses for this paper:

> *Hypothesis 1: As donor responsiveness increases, the effect of recipient country democracy on the bilateral proportion of total aid provided for a given disaster increases.*

> *Hypothesis 2: For low responsive donors, an increase in recipient country democracy will decrease the bilateral proportion of total aid provided for a given disaster.*

> *Hypothesis 3: For high responsive donors, an increase in recipient country democracy will increase the bilateral proportion of total aid provided for a given disaster.*

3.4   RESEARCH DESIGN

The data source used for disasters comes from the Emergency Events Database (EM-DAT), which is maintained by the World Health Organization (WHO) Collaborating Centre for Research on the Epidemiology of Disasters (CRED). This database tracks worldwide disasters and gathers information on the impact of those disasters including death tolls, the number of people affected and the estimated economic impact for each individual disaster. It includes information on more than 18,000 mass disasters that have occurred throughout the world since 1900 (CRED - Université Catholique de Louvain - Brussels, Belgium, 2012).

The source for humanitarian aid is from the Financial Tracking System (FTS) of the United Nations Office of the Coordination of Humanitarian Affairs (OCHA). This data set covers all disasters for which OCHA has issued an appeal for funding since 1992, which includes more than 1000 separate disasters. Each entry in this data set includes information on the name of the donor (countries, NGOs and private), the specific channel (direct to the government, multilateral agencies, NGOs) and the amount of aid provided (OCHA, 2012).

The data set used in the first model in this paper includes data on 211 disasters from 1992-2001 to develop the *responsiveness* variable used to distinguish donor types. Recent literature on foreign aid giving identifies a change in the strategic nature of foreign aid disbursal following the end of the Cold War and much subsequent work attempts to account for this change in behavior (Dunning, 2004; Bearce and Tirone, 2010). Limiting the data to the post-Cold War period avoids this confounding influence. For this paper, the sample is limited to 34 OECD donors, which account for more than 90% of the disaster aid provided from states during this time period. As these countries provide the majority of disaster aid, they serve as leaders in the process of aid giving. Furthermore, most of the non-OECD donors had too few observations to be able to estimate a *responsiveness* variable from their donations. The unit of analysis is the disaster-donor-recipient triad. For model 1, all 34 potential donors are paired with each possible disaster-recipient pair. This results in 7174 triadic observations.[29]

The first step in the analysis involves determining the level of humanitarian responsiveness for a given OECD donor. This is accomplished by performing a separate estimation for each donor using the following OLS regression:

$$aid_{ijdt} = \beta_0 + \beta_1 deaths_{jdt} + \beta_2 colony_{ij} + \beta_3 distance_{ij} + \beta_4 trade_{ijt} + \beta_5 gdp_{jt} +$$

$$\beta_6 population_{jt} + \beta_7 oil_{jt} + \beta_8 alliance_{ijt} + \beta_9 democracy_{jt} + \epsilon \quad (3)$$

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[29]Almost all of the disasters pair with just one recipient country. A notable exception is the 2004 Indian Ocean Tsunami. Thus, this event pairs multiple recipients with the same disaster and each disaster-recipient pair is then paired with each of the 34 donors to create unique disaster-donor-recipient triads.

The dependent variable *aid* is the natural log of the total amount of aid provided by donor i to recipient j for disaster d in year t. The main independent variable *deaths* denotes the natural log of the total number of deaths in disaster d.[30] The remaining independent variables control for a variety of strategic reasons why donors might provide aid to a given recipient. The variable *colony* denotes whether or not recipient j was ever a colony of donor i (Mayer and Zignago, 2011). A common colonial heritage is expected to increase the amount of aid given from a donor. *Distance* identifies the natural log of the distance between the capitals of i and j (Mayer and Zignago, 2011). Similar to gravity models of trade that predict increased trade on the basis of geographic proximity, the expectation is that smaller distances will result in larger amounts of relief aid provided. The *alliance* variable denotes whether i and j have a military alliance in year t, which would be expected to increase the amount of relief aid provided following a disaster (Leeds et al., 2002). Equation 3 also includes the natural log of the total exports from donor i to recipient j in year t (Barbieri, Keshk and Pollins, 2009; Barbieri and Keshk, 2012). Large levels of exports between i and j are expected to increase the amount of relief aid flows. The variables *gdp* and *population* denote the natural log of the GDP and population, respectively, of the recipient country (World Bank, 2012b). Finally, the variable *oil* is a dummy variable which indicates whether oil revenues constitute at least 30% of the recipient country's GDP in year t (World Bank, 2012b). Oil-rich countries are expected to be more strategic targets for relief aid than those lacking this valuable resource.

For the final variable, *democracy*, this paper uses two different measures for the recipient country j. The primary measure used to account for the presence of democratic institutions in the recipient country is the revised combined polity score. This measure combines several components created to measure the level of autocracy and the level of democracy in a country (such as executive restraint and competitiveness of participation) and scores each recipient on

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[30]The paper uses the number of deaths instead of estimated damages for two reasons. First, the data on estimated damages is missing for many disasters, which greatly limits the sample. Second, data on estimated damages are often difficult to verify and easier to manipulate by national governments (with the underlying desire to attract more aid) than data on the number of deaths (see Yang 2008).

a scale from -10 (autocratic) to 10 (democratic) (Marshall, Jaggers and Gurr, 2012). For the purposes of this paper, the revised combined polity score provides a broad combined measure of the extent of democratic institutions in the recipient country that could facilitate either the distribution of aid to victims based on their level of need (in more democratic recipient countries) or the exchange of policy concessions (in less democratic recipient countries).[31]

As a robustness check, the paper also uses a measure from selectorate theory that indicates the size of the winning coalition in the recipient country (Bueno de Mesquita et al., 2003). This concept refers to the number of people needed from the broader selectorate (those able to choose a leader) whose support is necessary for a leader to remain in power. In small coalition nations such as military juntas, the leader would maintain the support of the winning coalition via the distribution of private goods to a few select individuals, while in large coalition nations, the leader would better maintain the support of the winning coalition via the distribution of public goods. Thus, larger coalition recipients would be more likely to distribute post-disaster relief aid based on need while smaller coalition nations would have a greater ability to offer policy concessions in exchange for aid. The variable ranges from 0 (small coalition) to 1 (large coalition).

Table 14 below presents the results from combining all of the countries into a pooled regression for Equation 3.[32] In this table, Model 1 uses the combined polity score as a measure for democracy, while Model 2 uses coalition size to measure democracy. The results in the two models are very similar. As expected, the number of deaths in a given disaster has a significant positive effect on the total amount of relief aid provided by a donor country. A 10% increase in the number of deaths in a given disaster increases the total amount of aid

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[31]To test whether a more refined measure of a particular dimension of democracy alters the results, additional models included two sub-components of the revised combined polity score (executive constraints and competitiveness of participation) as alternative measures of democracy. The results remain robust to these changes in model specification.

[32]A measure for democracy is included in the models for column 1 and column 2 in Table 14 as it makes theoretical sense that the democratic institutions in a recipient country may have an effect on donor country giving at both the initial stage of deciding how much to give as well as the second stage of deciding the bilateral proportion of total aid. Column 3 in Table 14 does not include a measure for *democracy* and yields virtually identical results (which is unsurprising given the substantively small and statistically insignificant coefficient associated with the variables used to measure democracy in the first two models).

provided by about 5%. Furthermore, the results suggest that poorer recipients and those that were former colonies of a particular donor will attract more relief aid from that donor. Also, a strong trading relationship between the donor and recipient will increase the amount of relief aid provided. A 10% increase in the total exports to a recipient in a given year increases the amount of aid provided by a given donor by about 7%.

Several variables do not reveal the expected significant relationship with the total amount of disaster aid provided. Contrary to expectation, oil-exporting recipients actually receive less post-disaster aid than those countries that lack this resource.[33] Also, increasing the distance between the donor and recipient countries actually increases the amount of relief aid provided. The most notable statistically insignificant coefficients for the purposes of this paper are the ones associated with each of the *democracy* variables. This result corresponds to the results found in Bueno de Mesquita and Smith (2009). It appears that, in the pooled sample, neither an increase in the combined polity score (thus becoming more democratic) nor an increase in the size of the coalition in a recipient country (also becoming more democratic) has a significant effect on the allocation of disaster aid provided by OECD donors. Since existing theories predict either a significant positive or a significant negative effect, this empirical result is surprising.[34]

After obtaining results from the pooled regression of donors, the next step involved estimating Equation 3 for each of the 34 OECD donors separately. The values for the individual donor coefficients for *deaths* serve as a proxy for the level of humanitarian *responsiveness* for a given donor country. This concept refers to the empirical reality of how governments provide funding for varying levels of humanitarian need, controlling for their strategic interests in those recipient countries. At higher levels of humanitarian responsiveness, countries

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[33]Raschky and Schwindt (2012) find a similar statistically significant and negative relationship between oil-rich recipient countries and the amount of post-disaster aid provided. However, they show that although analysis of the group of oil-rich countries as a whole reveals a reduction in post-disaster aid following a disaster, a subsample of recipient countries that are poorly governed tend to receive an increase in post-disaster aid (which they argue provides some evidence for the strategic targeting of relief aid).

[34]The results from Table 14 are similar for each model when removing the largest donor (U.S.) from the sample. See Table 19 in Appendix.

Table 14: The Determinants of the Provision of Post-Disaster Relief Aid

	(1) Total Aid	(2) Total Aid	(3) Total Aid
Deaths	0.5193***	0.5154***	0.5229***
	(0.0666)	(0.0669)	(0.0680)
Colony	1.6450***	1.6560***	1.6561***
	(0.4098)	(0.4090)	(0.4097)
Distance	0.2800*	0.2357	0.3134**
	(0.1517)	(0.1514)	(0.1486)
Exports	0.7306***	0.7303***	0.7300***
	(0.0465)	(0.0464)	(0.0465)
GDP	−0.5548***	−0.5840***	−0.5497***
	(0.1789)	(0.1829)	(0.1784)
Population	−0.2522	−0.2310	−0.2651*
	(0.1606)	(0.1639)	(0.1581)
Oil	0.0816	0.0209	0.0869
	(0.3489)	(0.3494)	(0.3503)
Alliance	0.0049	−0.0787	0.0373
	(0.3174)	(0.3172)	(0.3227)
Polity Score	0.0128		
	(0.0200)		
Coalition Size		0.7361	
		(0.4690)	
Constant	13.1059***	13.4638***	12.9327***
	(3.0539)	(3.0047)	(3.0531)
N	7174	7174	7174

(1) All models include standard errors clustered by donor.
(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

have a stronger preference for humanitarian interests in providing post-disaster aid. At lower levels of humanitarian responsiveness, countries have a stronger preference for strategic interests when providing post-disaster aid. Thus, once we control for strategic motivations, the coefficient on the variable *deaths* obtained for each country should reflect the purely humanitarian motivations of each donor (with some error) and help distinguish between donor types.

Table 15 presents the Responsiveness Index extracted from the analysis of Equation 3 for each country and used for Equation 4.[35] The country with the highest level of responsiveness

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[35] The analysis resulting in the Responsiveness Index used the revised combined polity score as the measure

to disasters was Japan with a coefficient of 1.54. Controlling for the various strategic reasons for giving, the impact of disasters had a larger effect on the amount of disaster aid provided by Japan than for any other donor. With a score of .71, the United States falls in the middle of the list, but above the OECD average of .51 (and notably less strategic and more humanitarian in this process than commonly assumed in the literature). Several countries scored near zero, indicating that the death toll in a disaster had little or no significant effect on the amount of relief aid given by that particular country. These results provide an avenue for distinguishing between donor types and factor into the main model of the paper described in the next section.[36]

3.5 RESULTS

The key model of this paper uses the interaction of donor types (measured by their responsiveness) and recipient country democracy to predict the bilateral proportion of total aid given by the 34 OECD donors following a disaster. The OLS model is below:

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for democracy in the model. Estimating the model with coalition size as the measure for democracy instead of the revised combined polity score resulted in slight changes to some of the values of the index scores for each country. The rank ordering of countries from high to low responsiveness, however, was unchanged. See Table 20 in Appendix. Furthermore, using the alternative index in the final models of the paper yields similar results. See Table 21 in Appendix.

[36]The coefficients on the variable *deaths* for ten countries did not reach a standard level of statistical significance. These countries are included in the models presented in the Results section below. Rerunning the models and dropping these ten courntires from the sample yields similar results. See Table 22 in Appendix.

The results in Table 15 differentiate donors based on the level of altruism revealed through their giving preferences. An interesting question that stems from this analysis is the following: what makes a country more or less responsive? In other words, is there a commonality among the countries at the top of Table 15 that guides them to respond to a disaster with a more humanitarian approach? One possibility is that countries with high levels of spending on domestic social programs for at-risk populations (such as the poor or elderly) may extend this view of the role of government in caring for at-risk populations in other countries. Another related possibility is that public opinion on foreign aid effectiveness more generally may impact the level of responsiveness of a given country. If the public views foreign aid as an effective tool at eradicating poverty in other countries, then it may be more willing to support politicians with policies designed to address the neediest among disaster victims (Tingley, 2010). Finally, the preceding chapter in this dissertation suggests that some donors may be more responsive (and, importantly, less strategic) than others in order to signal their commitment to the international public good. Although this question poses an interesting avenue for research, analyzing the determinants of the level of responsiveness of a given country is beyond the scope of this chapter.

Table 15: Responsiveness Index of OECD Donors

Donor	Responsiveness	Standard Error
Japan	1.55	0.14***
Spain	1.12	0.15***
United Kingdom	1.06	0.17***
Italy	0.96	0.16***
Netherlands	0.94	0.16***
Switzerland	0.88	0.14***
Australia	0.84	0.14***
Germany	0.81	0.18***
Denmark	0.78	0.17***
Luxembourg	0.77	0.16***
Sweden	0.76	0.19***
Canada	0.75	0.17***
France	0.75	0.14***
United States	0.70	0.19***
New Zealand	0.69	0.12***
Norway	0.65	0.18***
Austria	0.64	0.15***
Belgium	0.55	0.15***
Ireland	0.53	0.15***
Finland	0.53	0.14***
Mexico	0.30	0.12**
Republic of Korea	0.14	0.06**
Israel	0.12	0.09
Greece	0.11	0.07
Portugal	0.10	0.05**
Chile	0.09	0.06
Turkey	0.08	0.05
Czech Republic	0.07	0.06
Slovenia	0.04	0.04
Iceland	0.03	0.03
Poland	0.03	0.05
Slovakia	0.00	0.01
Hungary	−0.01	0.01
OECD Average	0.51	−

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

$$bilateral_{ijdt} = \beta_0 + \beta_1 responsive_i + \beta_2 democracy_{jt} + \beta_3 responsive_i * democracy_{jt}+$$

$$\beta_4 colony_{ij} + \beta_5 distance_{ij} + \beta_6 trade_{ijt} + \beta_7 gdp_{jt} + \beta_8 population_{jt} + \beta_9 oil_{jt} + \epsilon \quad (4)$$

The sample for this model includes 272 disaster events from 2002-2009 and uses only those observations where a donor provided some form of relief aid (whether bilateral, multilateral, or both) to the recipient in a given disaster. This results in 1518 donor-disaster-recipient triadic observations. The dependent variable (*bilateral*) is the proportion of the total aid that is given bilaterally by donor i to recipient j in disaster d and year t. As mentioned above, the variable *responsive* is the coefficient on the variable *deaths* in Equation 3 for each donor i. The two variables used for *democracy* are the revised combined polity score and the coalition size of the recipient country j in year t. Equation 4 also includes an interaction term for the variables *responsive* and *democracy* and includes the same control variables found in Equation 3.[37]

Table 16 presents the results of the model estimations of Equation 4.[38] The models in columns 1 and 2 use polity as a measure for democracy, while the models in columns 3 and 4 use coalition size as the democracy measure. The direction, magnitude and significance levels of the coefficients for *polity* and *responsive*polity* in model 1 are similar to those in model 2, after the inclusion of various control variables. A similar pattern exists with the coefficients for *coalition* and *responsive*coalition* in models 3 and 4. Given that the hypotheses involve the use of interaction terms, however, the regression table provides little additional information concerning both the point estimates and the confidence intervals surrounding them necessary to validate the predictions (Brambor, Clark and Golder, 2006; Ai and Norton, 2003).

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[37]Although the variable *alliance* is included in the first equation to determine the Responsiveness Index (using the 1992-2001 sample), it is not included in the second equation due to limitations on data availability. Data on this variable does not extend past 2003 and, since the sample for the second equation begins in 2002, including *alliance* would limit the number of observations dramatically. Also, the final results were

Table 16: The Effects of Responsiveness and Democracy on the Proportion of Bilateral Aid

	(1) Proportion	(2) Proportion	(3) Proportion	(4) Proportion
Responsiveness Index	−0.0397	−0.0770	−0.0468	−0.0452
	(0.2446)	(0.2508)	(0.2658)	(0.2871)
Polity	−0.0069*	−0.0088**		
	(0.0036)	(0.0035)		
Responsive*Polity	0.0109***	0.0117***		
	(0.0037)	(0.0034)		
Coalition			−0.2189	−0.2745*
			(0.1304)	(0.1366)
Responsive*Coalition			0.2058	0.2212
			(0.1547)	(0.1540)
Deaths		0.0200***		0.0185**
		(0.0049)		(0.0078)
Colony		−0.0451		−0.0408
		(0.1071)		(0.1452)
Distance		−0.0434*		−0.0354
		(0.0218)		(0.0289)
Exports		0.0382**		0.0174
		(0.0166)		(0.0139)
GDP		0.0227		0.0494*
		(0.0208)		(0.0246)
Population		−0.0937***		−0.1027***
		(0.0211)		(0.0195)
Oil		−0.0449		−0.0519
		(0.0298)		(0.0354)
Constant	0.2729*	1.5178***	0.3434*	1.1128**
	(0.1548)	(0.2922)	(0.1695)	(0.4627)
N	1498	1498	715	715

(1) All models include standard errors clustered by donor.
(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 6 shows the marginal effect of an increase in the polity score on the bilateral pro-portion of total aid given across different levels of donor responsiveness.[39] Consistent with Hypothesis 1, as the level of humanitarian responsiveness in donors increases, an increase in recipient country democratic institutions increases the proportion of total aid given bilater-ally following a disaster. The effect for a 1-unit increase in the polity score increases from about -1 percent at low levels of donor responsiveness to about 1 percent at high levels of donor responsiveness. The more responsive a given donor, the greater is their proportion of aid given bilaterally in response to improving democratic institutions in a recipient country.
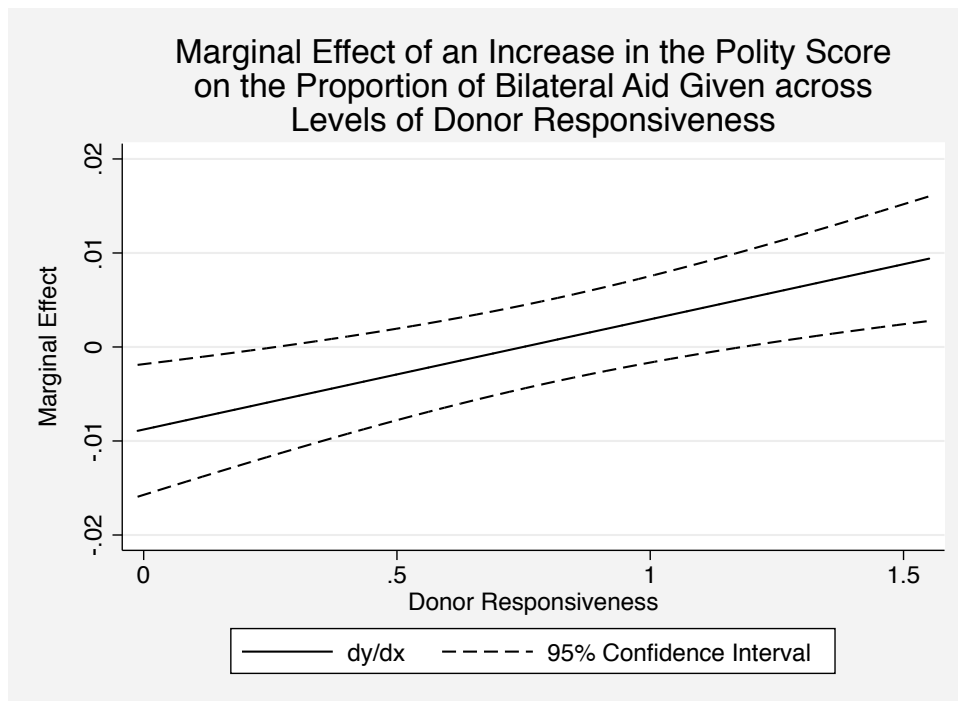
Figure 6: Polity, Responsiveness and Bilateral Aid Proportion

Figure 6 also provides evidence to support Hypothesis 2 and Hypothesis 3. At low levels of donor responsiveness (ranging from 0 to about .3), an increase in the polity score of a recipient country (thus becoming more democratic) results in a significant decrease in

similar when tested with a model that did not include the control variables outlined in Equation 4.
[38]I re-estimated the models in Table 16 without the largest donor (United States) and the largest disaster (2004 Indian Ocean Tsunami) in the sample and received similar results. See Table 23 in Appendix.
[39]Figures 6-9 use the results from the corresponding models that include the control variables.

the proportion of aid given bilaterally, which confirms Hypothesis 2. Portugal, with a low responsiveness index of .10, is predicted to give 35% of its relief aid bilaterally for autocratic recipients with a polity score of -6. If a disaster happens in a more democratic country with a polity score of 6, the predicted value of the proportion of bilateral aid given by Portugal falls to 25%.[40]

Hypothesis 3 states that highly responsive donors will respond to an increase in democratic institutions by increasing the proportion of aid given bilaterally. Figure 6 also provides evidence to support this hypothesis. Japan, with the highest responsiveness index in the sample at 1.54, is predicted to give 13% of its disaster relief aid bilaterally for autocratic recipients with a polity score of -6. For a more democratic recipient with a polity score of 6, the predicted value of the proportion of bilateral aid given by Japan nearly doubles to 24%.

At middling values of the responsiveness index, however, we do not encounter a significant effect of democracy on changes in the proportion of aid provided bilaterally. The United States has a responsiveness index score (.71) slightly above the OECD average (.51). For autocratic recipients with a polity score of -6, the United States is predicted to distribute 26% of its total aid bilaterally. If a disaster happens in a more democratic recipient country with a polity score of 6, the predicted value of aid provided bilaterally by the United States is statistically the same (25%). Thus, the competing effects of democratic institutions on the amount of aid provided bilaterally that we see in the results above help to explain the lack of statistical significance on the coefficients for *democracy* in the pooled regression result in Table 14. Accounting for donor heterogeneity is key to understanding the puzzling results from prior research.

To test the robustness of the choice in measure for *democracy*, Figure 7 shows the marginal effect of an increase in coalition size on the proportion of bilateral aid given across different levels of donor responsiveness. Due to limited availability of the variable for coalition size, the sample used in this analysis is restricted to 136 disasters from 2002-2005. The results are

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[40]All predicted values in this paper are estimated while holding the control variables at their means.

similar to those found in Figure 6. Consistent with Hypothesis 1, as the level of humanitarian responsiveness increases, an increase in recipient country democratic institutions increases the proportion of total aid given bilaterally following a disaster. The graph also provides evidence for Hypothesis 2. At low levels of donor responsiveness, an increase in recipient country democratic institutions results in a decrease in the proportion of aid provided bilaterally. Portugal, with its responsiveness index of .10, is predicted to provide 31% of its total aid bilaterally to a recipient with a marginally autocratic coalition size of .25. For a more democratic recipient with a coalition size of .75, the predicted value of the proportion of bilateral aid falls by more than 1/3 to 18%. The results, however, do not provide convincing support for Hypothesis 3. Although the effect of democratic institutions on the proportion of aid given bilaterally is positive, the results are not statistically significant. The results do, however, demonstrate the different reactions to stronger recipient country democratic institutions in low responsive and high responsive donor countries. For highly responsive donors, a shift in a recipient country from a less democratic to a more democratic regime has no significant positive effect on the proportion of total relief aid provided bilaterally, while the same shift can significantly reduce the bilateral proportion of total aid given by low responsive donors.

In addition to using alternative measures for democracy, this paper substitutes a different dependent variable and model specification to test the robustness of the results. Using the same sample of 272 disaster events from 2002-2009, the following equation uses the interaction of donor types (measured by their responsiveness) and recipient country democracy to predict the probability of bilateral aid given by the 34 OECD donors following a disaster. The probit model is below:

$$Pr(bilateral_{ijdt} = 1|X) = \phi(\beta_0 + \beta_1 responsive_i + \beta_2 democracy_{jt} +$$

$$\beta_3 responsive_i * democracy_{jt} + \beta_4 colony_{ij} + \beta_5 distance_{ij} + \beta_6 trade_{ijt} +$$

$$\beta_7 gdp_{jt} + \beta_8 population_{jt} + \beta_9 oil_{jt} + \epsilon) \quad (5)$$

Marginal Effect of an Increase in the Coalition Size on the Proportion of Bilateral Aid Given across Levels of Donor Responsiveness
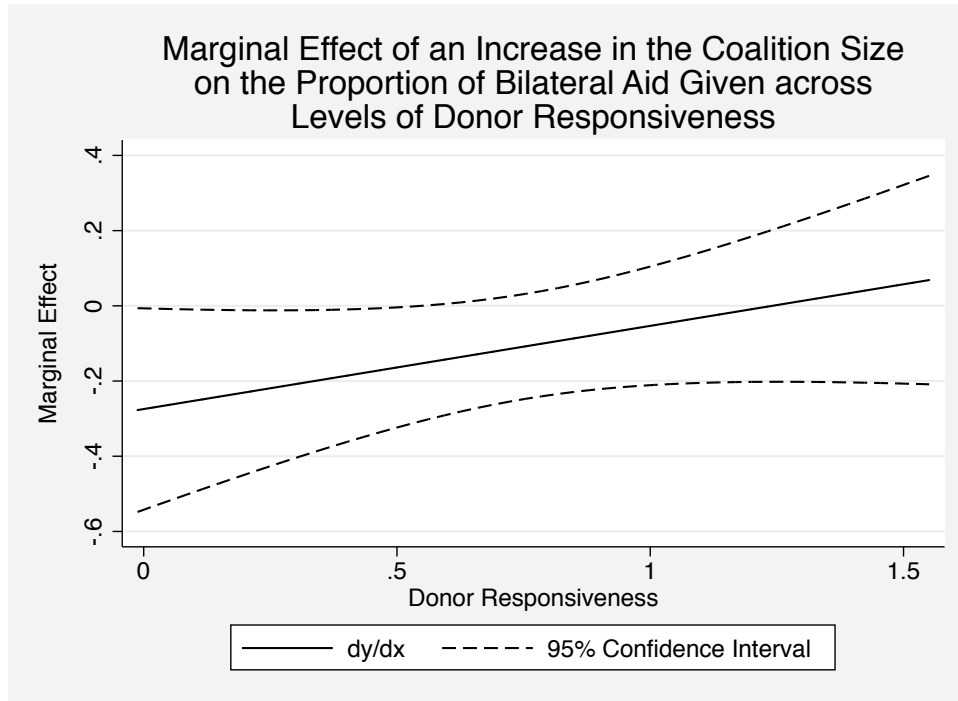
Figure 7: Coalition Size, Responsiveness and Bilateral Aid Proportion

The dependent variable is a dummy indicating 1 if some portion of the aid provided was given bilaterally and 0 otherwise. As mentioned above, the variable *responsive* is the coefficient on the variable *deaths* in model 1 for each country i. The two variables used for *democracy* are 1) a dummy variable indicating 1 if the revised combined polity score in recipient country j in year t is greater than 5 and 0 otherwise and 2) the coalition size of the recipient country j in year t.[41] The model also includes an interaction term for the variables *responsive* and *democracy* and includes the same control variables found in the model for Equation 3.[42] The hypotheses corresponding to the alternative probit model are outlined below:

Hypothesis 4: As donor responsiveness increases, the effect of recipient country

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[41]The dummy variable for the polity score was used for ease of interpretation of the predicted probability graph. Using the 20-point polity scale results in a graph that is similar in shape and significance in both the low and high responsive donor ranges.

[42]Again, the variable *alliance* does not extend past 2003 and, therefore, is not included in this model as it would limit the number of observations dramatically. Also, the final results were similar when tested with a model that did not include the control variables outlined in Equation 5.

democracy on the probability of providing bilateral aid will increase.

Hypothesis 5: An increase in recipient country democracy will decrease the probability that low responsive donors will provide bilateral aid to that recipient.

Hypothesis 6: An increase in recipient country democracy will increase the probability that high responsive donors will provide bilateral aid to that recipient.

Table 17 presents the results of the model estimations of Equation 5. The models in columns 1 and 2 use the dummy variable of the polity score as a measure for democracy, while the models in columns 3 and 4 use coalition size as the democracy measure. The direction, magnitude and significance levels of the coefficients for *polity* and *responsive*polity* in model 1 are similar to those in model 2, after the inclusion of various control variables. A similar pattern exists with the coefficients for *coalition* and *responsive*coalition* in models 3 and 4.

To more accurately portray the estimates and confidence intervals for the non-linear model specified in Equation 5, Figure 8 presents a difference in predicted probabilities graph.[43] The figure shows the difference in predicted probabilities of providing bilateral aid for a democratic recipient minus the predicted probability of providing bilateral aid for a nondemocratic recipient, across levels of donor responsiveness. Consistent with Hypothesis 4, as the level of humanitarian responsiveness in donors increases, an increase in recipient country democratic institutions increases the probability of providing bilateral aid following a disaster. This is evident from Figure 8 as the difference in predicted probabilities of providing aid to a democratic recipient as compared to a nondemocratic recipient is -14% at low donor responsiveness, but this difference in predicted probabilities increases to roughly 9% at high donor responsiveness levels. The more responsive a given donor, the more likely they are to reward improving democratic institutions with the provision of aid directly to the government.

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[43]This graph depicts the results of Model 2 in Table 17.

Table 17: The Effects of Responsiveness and Democracy on the Probability of Bilateral Aid

	(1) $Pr(bi=1\mid X)$	(2) $Pr(bi=1\mid X)$	(3) $Pr(bi=1\mid X)$	(4) $Pr(bi=1\mid X)$
Responsiveness Index	−0.0506	−0.2107	−0.1828	−0.3206
	(0.5985)	(0.6540)	(0.6187)	(0.7325)
Polity	−0.0248**	−0.0296***		
	(0.0098)	(0.0083)		
Responsive*Polity	0.0360***	0.0367***		
	(0.0096)	(0.0093)		
Coalition			−0.7490*	−0.9415**
			(0.3853)	(0.4208)
Responsive*Coalition			0.5926	0.6464
			(0.3812)	(0.4238)
Deaths		0.1410***		0.1385***
		(0.0172)		(0.0303)
Colony		−0.0896		−0.0914
		(0.2647)		(0.3651)
Distance		−0.0643		0.0568
		(0.0690)		(0.1122)
Exports		0.1914***		0.1670***
		(0.0411)		(0.0438)
GDP		−0.0115		−0.0159
		(0.0555)		(0.0644)
Population		−0.3355***		−0.3282***
		(0.0592)		(0.0529)
Oil		−0.2926***		−0.3796***
		(0.0989)		(0.1156)
Constant	−0.4106	4.9340***	0.0226	4.4572***
	(0.3806)	(0.7449)	(0.4079)	(1.4661)
N	1498	1498	715	715

(1) All models include standard errors clustered by donor.
(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
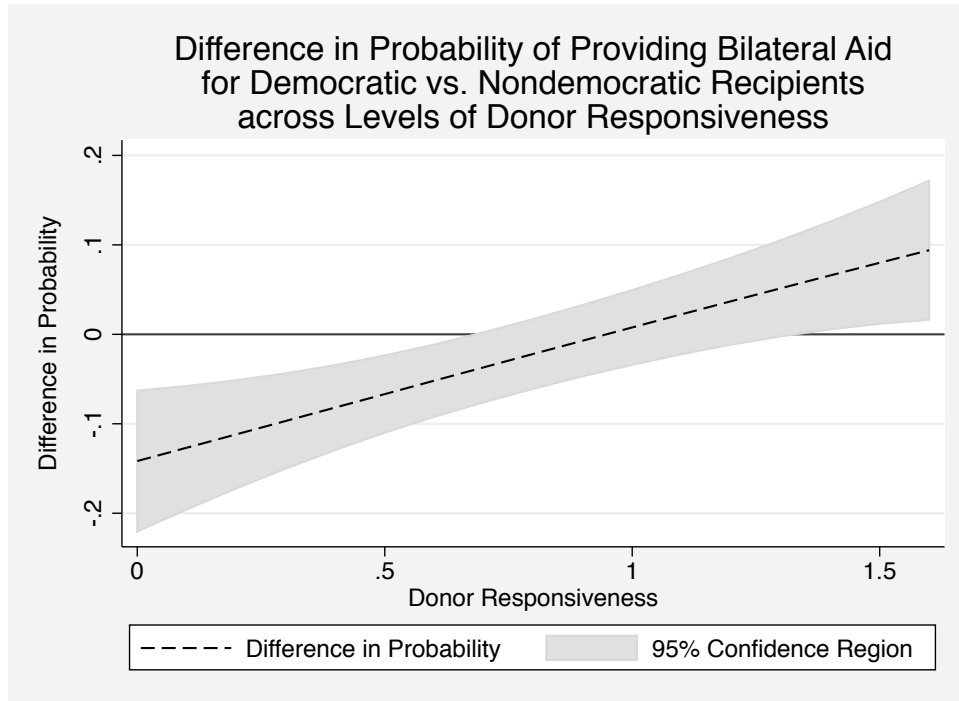
Figure 8: Polity, Responsiveness, and Probability of Bilateral Aid

The results provide support for Hypothesis 5 and Hypothesis 6 as well. Consistent with Hypothesis 5, at low levels of humanitarian responsiveness, transitioning from a nondemocratic to a democratic recipient country results in a significant negative effect on the likelihood of providing bilateral aid. Portugal has a predicted probability of providing bilateral aid to a nondemocratic country of 41%, but its predicted probability falls by roughly 1/3 to 27% for a democratic recipient. For high responsiveness donors, however, the trend reverses, which provides evidence for Hypothesis 6. Japan has a predicted probability of providing bilateral aid to a nondemocratic recipient of 24%. Its predicted probability increases by more than 1/3 to 33% when the recipient is a democratic country. Thus, this alternate specification of the model provides consistent support for the original hypotheses.

Figure 9 shows the difference in predicted probabilities of providing bilateral aid for a 1-unit change in coalition size across different levels of donor humanitarian responsiveness.[44]

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[44] The graph depicts the results of Model 4 in Table 17. Due to limited availability of the variable for coalition size, the sample used in this analysis is restricted to 136 disasters from 2002-2005.

As the variable measuring democracy (*coalition*) ranges from 0 to 1, the graph depicts the predicted probability of providing bilateral aid to a large coalition government minus the predicted probability of providing bilateral aid to a small coalition government across different donor types. Similar to Figure 8, the results in Figure 9 are consistent with Hypothesis 4. As the level of humanitarian responsiveness in donors increases, an increase in recipient country democratic institutions increases the probability of providing bilateral aid following a disaster. The difference in predicted probabilities of providing bilateral aid to a large coalition (democratic) recipient as compared to a small coalition (nondemocratic) government is -36% at low donor responsiveness levels, but this difference in predicted probabilities increases to a number indistinguishable from 0% at high responsiveness levels.
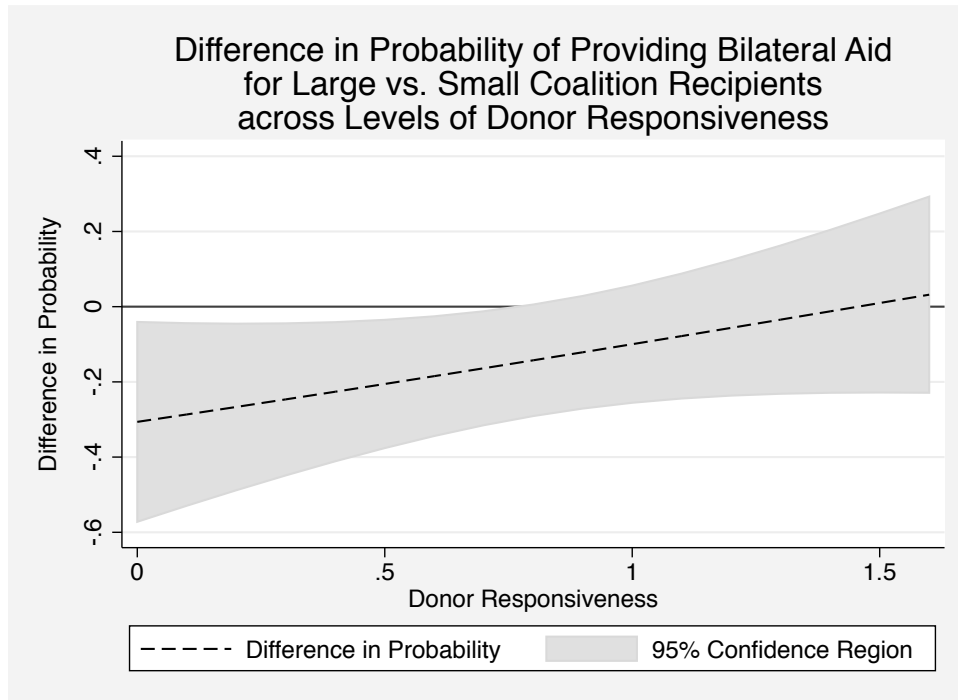
Figure 9: Coalition Size, Responsiveness and Probability of Bilateral Aid

These results provide strong support for Hypothesis 5, but not for Hypothesis 6. Consistent with Hypothesis 5, low responsive donors are significantly less likely to provide bilateral aid for a large coalition recipient than for a small coalition recipient. Portugal has a predicted probability of providing bilateral aid for a small coalition recipient of 59%. This

predicted probability, however, falls by more than 1/2 to 23% for large coalition recipients. These results, however, do not provide strong support for Hypothesis 6, which predicted a significant positive effect on the propensity to give bilaterally for high responsive donors. Figure 9 reveals that the presence of stronger democratic institutions in a recipient country has a slightly positive, but not statistically significant, effect on the probability of providing bilateral aid for highly responsive donors. The overall results do, however, demonstrate the different reactions to stronger recipient country democratic institutions in low responsive and high responsive donor countries. For high responsive donors, a shift in a recipient country from a less democratic to a more democratic regime has no significant effect on their propensity to provide disaster aid bilaterally, while the same shift can reduce by more than 50% the probability of giving bilateral aid for low responsive donors.

The results presented in this section provide strong evidence for the idea that donors with varying levels of responsiveness to disasters react differently to the presence of democratic institutions in the recipient country. For donors with low levels of responsiveness, an increase in democratic institutions in the recipient country decreases the proportion of aid provided bilaterally and decreases the probability of providing bilateral aid at all. This result is consistent using multiple measures for democracy and alternative measures for the dependent variable.

For donors with high levels of responsiveness, an increase in democratic institutions in the recipient country increases the proportion of aid provided bilaterally and increases the probability of providing bilateral aid at all. This result is statistically significant using the revised combined polity score, but fails to reach statistical significance when using coalition size. One possible explanation for the failure to reach statistical significance is due to the limited number of observations in the sample used for coalition size (which only covers the 2002-2005 period). Figure 10 presents results of models for Equation 4 and Equation 5 using the full sample of disasters (2002-2009) and one of two alternative measures of democracy that may capture the underlying dimensions of coalition size. Each of these two measures

is a sub-component of the revised combined polity score. The executive constraint variable codes the "extent of institutionalized constraint on the decision-making authority of the chief executive, whether individual or collective" (Marshall, Jaggers and Gurr, 2012). This variable ranges from 1 (unlimited authority) to 7 (executive parity or subordination). The top-left graph provides support for Hypotheses 1-3. As donor responsiveness increases, a strengthening of executive constraint (indicating a move to more democratic institutions in a recipient country) increases the proportion of aid provided bilaterally. Low responsive donors respond to increasing democratic institutions by reducing this bilateral proportion, while highly responsive donors respond with an increase in the bilateral proportion of total aid. Furthermore, the top-right graph lends support for Hypotheses 4-6. The difference in probability of providing bilateral aid to recipients with high vs. low executive constraint is negative for low responsive donors, which indicates a higher probability of giving bilaterally to less democratic recipients. The opposite is true for high responsive donors, who are more likely to give bilateral aid to more democratic recipients.

The graphs on the bottom row of Figure 10 use political competition as a measure for democracy. This measure refers to the "extent to which alternative preferences for policy and leadership can be pursued in the political arena." (Marshall, Jaggers and Gurr, 2012). The variable ranges from 1 (repressed) to 5 (competitive). The bottom-left graph provides support for Hypotheses 1-3. As donor responsiveness increases, stronger political competition (indicating more democratic institutions in the recipient country) increases the proportion of aid provided bilaterally. Furthermore, more democratic institutions spark a decrease in the proportion of aid provided bilaterally from low responsive donors, but trigger an increase in this proportion from high responsive donors. Additionally, the bottom-right graph lends support for Hypotheses 4-6. The difference in probability of providing bilateral aid to recipients with high vs. low levels of political competition is negative for donors with low levels of responsiveness. For highly responsive donors, this result reverses, indicating their higher probability for giving aid to more democratic recipients. The results from
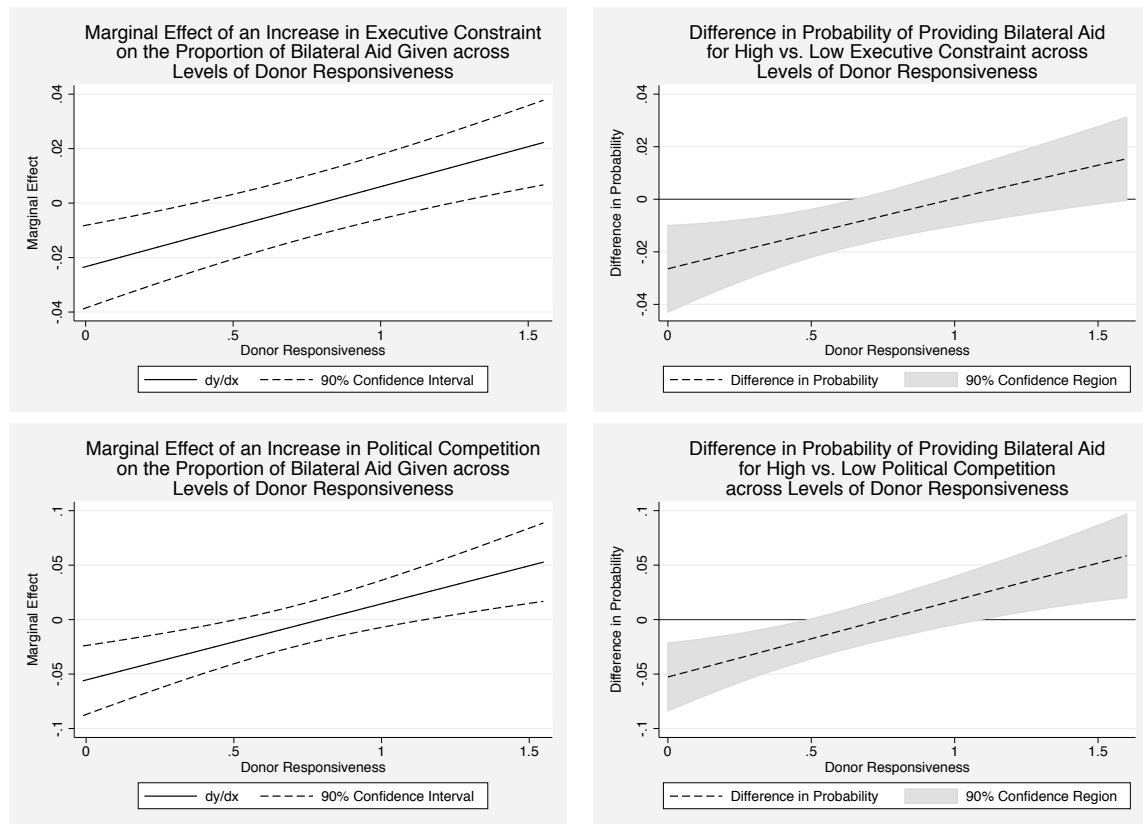
Figure 10: Democracy, Responsiveness, and Bilateral Aid Proportion & Probability

Figure 10, therefore, provide additional support for the full range of hypotheses presented in this paper.

A final robustness check considers the uncertainty in the parameter estimates for the *responsiveness* variable for each country. Equation 4 uses a point estimate (derived from Equation 3) to identify the level of *responsiveness* for each donor. Using this estimate directly, however, may overstate the certainty of the actual value of *responsiveness*. Due to measurement error, the inference drawn from Equation 4 could be too optimistic. To address this concern, I use a method based on the normal approximation of the posterior distribution of the Equation 3 estimates and apply the results to Equation 4 (Tanner, 1996). The approach used here is similar to one taken in Pemstein, Meserve and Melton (2010) and generalized in Arel-Bundock and Mebane (2012). It seeks to propagate the uncertainty in the estimates from Equation 3 into the linear regression analysis in Equation 4. Table 18 presents

Table 18: Simulated Effect of Democracy & Responsiveness on Bilateral Proportion

	Estimate	Lower 95%	Upper 95%
Responsive	−0.0657	−0.1819	0.0214
Polity	−0.0077	−0.0107	−0.0033
Responsive*Polity	0.0102	0.0037	0.0147
Killed	0.0201	0.0185	0.0209
Colony	−0.0455	−0.0623	−0.0242
Distance	−0.0443	−0.0600	−0.0192
Exports	0.0379	0.0308	0.0490
GDP	0.0230	0.0109	0.0309
Population	−0.0937	−0.0953	−0.0899
Oil	−0.0448	−0.0465	−0.0421
Constant	1.5081	1.4490	1.5722
N	1518		

The estimate for each variable is the mean of 1000 simulations.
The lower and upper 95% confidence intervals represent the
26th and 975th estimates, respectively, of the 1000 simulations.

the resulting parameter estimates and confidence intervals based on 1000 simulations. The magnitude and significance of these estimates are similar to those found in column 2 of Table 16. Figure 11 uses the median simulation result to display the marginal effect of polity on the proportion of bilateral aid given across levels of donor responsiveness. The results presented in Figure 11 are similar to those found in Figure 6. At low levels of donor responsiveness, an increase in the polity score of the recipient country reduces the proportion of aid provided bilaterally. For highly responsive donors, however, increasing the polity score increases the proportion of aid provided bilaterally. Failure to incorporate the uncertainty in the responsiveness estimates in the earlier models, therefore, had little effect on the results.

3.6 CONCLUSION

This chapter contributes to the extensive literature on the determinants of foreign aid giving by developing a metric for distinguishing between donor types with different preferences in their levels of humanitarian responsiveness to disasters. Classifying donors by type provides a way to adjudicate between competing theoretical predictions and empirical results con-
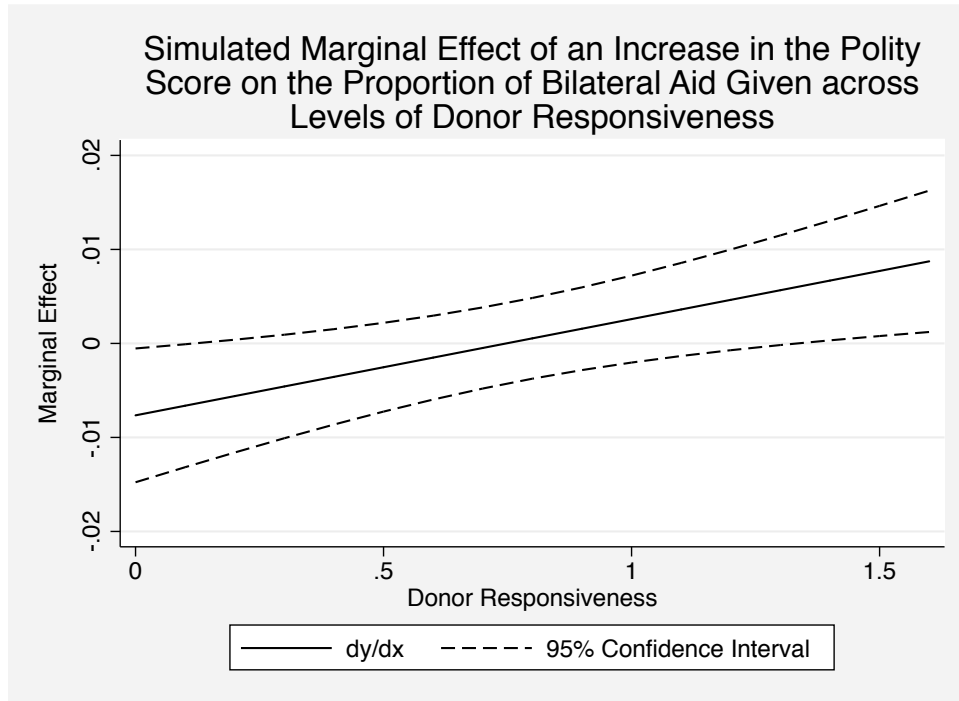
Figure 11: Polity, Responsiveness and Bilateral Aid Proportion based on 1000 simulations

cerning the effect of recipient country democratic institutions on the provision of foreign aid. Using disasters and the provision of relief aid via different channels, the results suggest that as donors become more responsive to natural disasters, the effect of more democratic institutions in recipient countries on the probability that donors will provide aid bilaterally increases. For low responsive donors, who may be more interested in policy concessions than in responding to humanitarian need, more democratic institutions in a disaster-affected country significantly reduces the proportion of total aid given bilaterally and decreases the likelihood of providing bilateral aid at all. These donors prefer to give money directly to less democratic governments who are better poised to provide policy concessions in exchange for the distribution of relief aid. For high responsive donors, conversely, the presence of more democratic institutions signals that aid provided directly to the government should filter to those in need, which results in an increase in the proportion of total aid given bilaterally to these recipient countries and increases the likelihood of providing bilateral aid at all. The same needs-based distribution to victims, however, is in question in recipient countries lack-

ing such democratic institutions, which reduces the likelihood that high responsive donors will provide bilateral aid to these less democratic recipient countries.

3.7 APPENDIX

Table 19: The Determinants of the Provision of Post-Disaster Relief Aid (excludes US)

	(1) Total Aid	(2) Total Aid	(3) Total Aid
Deaths	0.5090***	0.5046***	0.5120***
	(0.0652)	(0.0654)	(0.0665)
Colony	2.0486***	2.0584***	2.0565***
	(0.4163)	(0.4152)	(0.4159)
Distance	0.1342	0.0838	0.1631
	(0.1536)	(0.1539)	(0.1508)
Exports	0.6652***	0.6640***	0.6649***
	(0.0483)	(0.0481)	(0.0483)
GDP	−0.4711***	−0.4995***	−0.4671***
	(0.1739)	(0.1775)	(0.1734)
Population	−0.2810*	−0.2589	−0.2919*
	(0.1570)	(0.1601)	(0.1546)
Oil	0.0987	0.0388	0.1027
	(0.3375)	(0.3375)	(0.3386)
Alliance	−0.2052	−0.2986	−0.1802
	(0.3144)	(0.3133)	(0.3189)
Polity Score	0.0108		
	(0.0197)		
Coalition Size		0.7212	
		(0.4575)	
Constant	13.0540***	13.4359***	12.9087***
	(3.0198)	(2.9705)	(3.0173)
N	6963	6963	6963

(1) All models include standard errors clustered by donor.

(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 20: Responsiveness Index of OECD Donors (using coalition size)

Donor	Responsiveness	Standard Error
Japan	1.55	0.14***
Spain	1.11	0.15***
United Kingdom	1.06	0.17***
Italy	0.96	0.16***
Netherlands	0.93	0.17***
Switzerland	0.88	0.14***
Australia	0.82	0.14***
Germany	0.80	0.18***
Denmark	0.77	0.17***
Luxembourg	0.76	0.16***
Sweden	0.75	0.19***
Canada	0.75	0.17***
France	0.75	0.14***
United States	0.71	0.19***
New Zealand	0.67	0.12***
Austria	0.64	0.15***
Norway	0.63	0.18***
Belgium	0.55	0.15***
Ireland	0.52	0.15***
Finland	0.51	0.14***
Mexico	0.30	0.12**
Republic of Korea	0.14	0.07**
Israel	0.12	0.10
Greece	0.11	0.07
Portugal	0.10	0.05**
Chile	0.09	0.06
Turkey	0.08	0.06
Czech Republic	0.07	0.06
Slovenia	0.04	0.04
Poland	0.04	0.05
Iceland	0.03	0.03
Slovakia	0.00	0.01
Hungary	−0.01	0.01
OECD Average	0.51	−

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 21: The Effects of Responsiveness and Democracy on the Proportion of Bilateral Aid (using coalition size for index)

	(1) Proportion	(2) Proportion	(3) Proportion	(4) Proportion
Responsiveness Index	−0.0345	−0.0733	−0.0423	−0.0383
	(0.2452)	(0.2539)	(0.2661)	(0.2893)
Polity	−0.0068*	−0.0086**		
	(0.0036)	(0.0035)		
Responsive*Polity	0.0108***	0.0115***		
	(0.0037)	(0.0035)		
Coalition			−0.2201*	−0.2739*
			(0.1300)	(0.1367)
Responsive*Coalition			0.2083	0.2226
			(0.1548)	(0.1547)
Deaths		0.0201***		0.0186**
		(0.0049)		(0.0078)
Colony		−0.0454		−0.0411
		(0.1068)		(0.1451)
Distance		−0.0438*		−0.0369
		(0.0221)		(0.0293)
Exports		0.0380**		0.0166
		(0.0169)		(0.0144)
GDP		0.0228		0.0503*
		(0.0210)		(0.0249)
Population		−0.0937***		−0.1029***
		(0.0210)		(0.0194)
Oil		−0.0450		−0.0518
		(0.0297)		(0.0354)
Constant	0.2691*	1.5154***	0.3402*	1.1051**
	(0.1547)	(0.2962)	(0.1693)	(0.4657)
N	1498	1498	715	715

(1) All models include standard errors clustered by donor.
(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

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Table 22: The Effects of Responsiveness and Democracy on the Proportion of Bilateral Aid (excludes non-significant index)

	(1) Proportion	(2) Proportion	(3) Proportion	(4) Proportion
Responsiveness Index	0.2918	0.2355	0.6511***	0.5981***
	(0.3399)	(0.3072)	(0.1506)	(0.1609)
Polity	−0.0096**	−0.0105*		
	(0.0046)	(0.0054)		
Responsive*Polity	0.0134***	0.0123***		
	(0.0040)	(0.0041)		
Coalition			0.0812	0.0377
			(0.1739)	(0.1779)
Responsive*Coalition			−0.1340	−0.1588
			(0.2073)	(0.1906)
Deaths		0.0105**		0.0052
		(0.0048)		(0.0084)
Colony		−0.0824		−0.0798
		(0.0899)		(0.1570)
Distance		−0.0004		0.0065
		(0.0266)		(0.0379)
Exports		0.0558***		0.0457***
		(0.0172)		(0.0090)
GDP		−0.0023		0.0059
		(0.0194)		(0.0173)
Population		−0.0768***		−0.0748***
		(0.0224)		(0.0177)
Oil		−0.0341		−0.0502
		(0.0234)		(0.0375)
Constant	−0.0277	1.1250*	−0.2891**	0.6766
	(0.2787)	(0.5786)	(0.1382)	(0.5827)
N	1314	1314	632	632

(1) All models include standard errors clustered by donor.

(2) * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(3) Excludes countries where $p < 0.10$ for Responsiveness Index.

Table 23: The Effects of Responsiveness and Democracy on the Proportion of Bilateral Aid (excludes outliers)

	(1) Proportion	(2) Proportion	(3) Proportion	(4) Proportion
Responsiveness Index	−0.0042	−0.0583	−0.0404	−0.1121
	(0.2439)	(0.2486)	(0.2466)	(0.2426)
Polity	−0.0121***	−0.0146***	−0.0056*	−0.0064***
	(0.0043)	(0.0043)	(0.0032)	(0.0028)
Responsive*Polity	0.0169***	0.0184***	0.0109***	0.0112***
	(0.0042)	(0.0039)	(0.0033)	(0.0030)
Deaths		0.0167***		0.0212***
		(0.0045)		(0.0052)
Colony		−0.0540		−0.0657
		(0.1033)		(0.1207)
Distance		−0.0389		−0.0402
		(0.0234)		(0.0355)
Exports		0.0455**		0.0557**
		(0.0167)		(0.0207)
GDP		0.0160		0.0122
		(0.0207)		(0.0233)
Population		−0.0926***		−0.0955***
		(0.0218)		(0.0245)
Oil		−0.0491		−0.0236
		(0.0318)		(0.0298)
Constant	0.2414	1.5895***	0.2686*	1.7173***
	(0.1562)	(0.2897)	(0.1548)	(0.2373)
Excludes 2004 Tsunami	Yes	Yes	No	No
Excludes US	No	No	Yes	Yes
N	1401	1401	1302	1302

(1) All models include standard errors clustered by donor.

(2) $* \ p < 0.10$, $** \ p < 0.05$, $*** \ p < 0.01$

Chapter 4

Pork & Typhoons: The Influence of Political Connections on Disaster

Response (with Allen Hicken & Nico Ravanilla)

4.1 INTRODUCTION

Typhoon Haiyan recently swept across the Philippines, leaving a path of devastation in its wake. Similar to all governments in the aftermath of such disasters, the government of the Philippines mobilized resources to provide assistance to affected areas. Yet, a growing body of research questions the extent to which political calculations (as opposed to need) motivates this type of government response.[45] In this paper, we analyze the extent to which certain political calculations (specifically, connections between politicians) direct public goods provisions following natural disasters in one of the most disaster-prone countries in the world: the Philippines.

We focus our analysis on disaster response in the wake of typhoons and tropical storms. Using a unique dataset and novel methodological approach, we produce estimates of the extent of typhoon exposure across municipalities in the Philippines and then examine whether disaster assistance corresponds to the level of damage. Our emphasis is on a particular form of disaster assistance–discretionary congressional funds for the reconstruction of public infrastructure. We find that the extent of storm damage in a given municipality affects the

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[45]See, for example, Aldrich (2010); Garrett and Sobel (2003); Hyndman (2011); May (1985); Platt (1999); Reeves (2011); Salkowe and Chakraborty (2009).

amount of reconstruction funds allocated there. However, we also find that, even when controlling for the measure of typhoon exposure, political ties between members of Congress and local mayors, specifically a match in their party affiliation or their clan affiliation, increase the level of reconstruction funds allocated to that municipality. Finally, clan ties have a much larger effect on the distribution of per capita reconstruction funds than party ties.

This paper makes two contributions. First, we develop a novel and replicable methodological approach (storm exposure) to produce baseline estimates of the extent of disaster affectedness, which proxy the need for government resources in a given area. One of the most difficult tasks for policymakers and researchers alike is to estimate the extent to which efficiency considerations, as opposed to political calculations, play a role in distributive decisions (Golden and Min, 2013). Our method helps to overcome this challenge by producing estimates of storm exposure that serve as a baseline for comparing need-based versus politically motivated distribution decisions.

Second, we add to the broad literature on distributive politics by providing empirical evidence that even the very particular type of spending intended for disaster relief, when exposed to politicians' discretion, becomes subject to political calculations. In particular, we find that legislators direct repair and reconstruction funds in the wake of typhoons in favor of politically aligned local politicians. Thus, political connections between politicians at different levels of government (and not just partisan ties between politicians and voters) influence government disaster response efforts. Our work contributes to the growing body of evidence in the empirical literature on how partisanships impact the distribution of government resources (Arulampalam et al., 2009; Besley, Pande and Rao, 2012; Brollo and Nannicini, 2012; Burden, Berry and Howell, 2010; Larcinese, James M. Snyder and Testa, 2006; Solle-Olle and Sorribas-Navarro, 2008) and adds to recent scholarship on the influence of political calculations in disaster relief (Aldrich, 2010; Garrett and Sobel, 2003; Hyndman, 2011; May, 1985; Platt, 1999; Reeves, 2011; Salkowe and Chakraborty, 2009). Finally, by showing that clan ties direct disaster reconstruction funding in the Philippines over and

above the effect of party-based alliances, our results provide further evidence that ethnic, tribal, or clan ties may dominate distribution decisions in countries with weak party systems (Blaydes, 2011; Kasara, 2007; Kitschelt, 2007; Posner, 2004; Stasavage, 2005; Wantchekon, 2003).

The chapter proceeds as follows. In section 4.2, we review the literature on distributive politics, highlighting the role of political connections in explaining patterns of allocation. Section 4.3 describes the use of natural disasters as a baseline measure. In section 4.4, we develop our theory and outline several hypotheses about how political connections might affect the provision of disaster assistance in the Philippines. We describe our data and methodology and present our results in Section 4.5 and Section 4.6, respectively, while Section 4.7 concludes.

4.2 DISTRIBUTIVE POLITICS IN THE PHILIPPINES

There is a large and well-developed literature that draws connections between political parties, partisanship and distributive politics. For example, the existing literature on constituency targeting–whether it argues for swing, core or mixed targeting–argues that the partisan identity or tendency of voters or groups of voters helps shape the distribution of government goods and services (Ansolabehere and Snyder, 2006; Cox and McCubbins, 1986; Dixit and Londregan, 1996, 1998; Dunning and Stokes, 2010; Hiskey, 1999; McGillivray, 2004; Perez Yarahuan, 2006; Stokes, 2005; Stokes et al., 2013). This is true even where parties are relatively weak and party discipline is low (e.g. in the case of the weak-party majoritarian system example of the US).

Other work focuses on the connection between party/party system characteristics and the prevalence of particularism and clientelism (Kitschelt, 2000; Tabellini, 2004). Keefer and Khemani (2009), for example, demonstrate that strong links between voters and political parties curb incentives for legislators to provide pork to their constituents. By contrast, where ties between voters and candidates are of an ethnic, tribal or clan variety, politicians

have strong incentives to selectively target resources to their respective constituencies (Keefer and Khemani, 2009; Kitschelt, 2000; Pande, 2003).[46]

Recent work has focused on distributive politics in developing democracies where party ties may be weak relative to ethnic, tribal, or clan ties (Blaydes, 2011; Kasara, 2007; Kitschelt, 2007; Posner, 2004; Stasavage, 2005; Wantchekon, 2003). Who do politicians target where parties are not good cues for either voters or candidates and where, as a result, it is nearly impossible to differentiate between a party's core and marginal supporters? In this context, voters with weak party affinities are more likely to attribute the benefits of redistribution to individual politicians than to political parties that remain, for most voters, ephemeral abstractions. Hence, individual politicians are unlikely to redistribute public funds based solely on the partisan identities of voters.

This does not mean, however, that parties are superfluous in such democracies. In weakly-institutionalized systems, parties often serve as umbrellas for networks of other, more important power relationships. Particularly important is the relationship between upper-level politicians who wield the redistribution power via their access to the national budget and local leaders who control the power of mobilization via their dense social networks at the grassroots level.[47] Parties may exist on an ad hoc basis precisely because those who hold the power to distribute resources need to strike bargains with those who have the power to mobilize electoral support in a classic exchange of distributive benefits for votes (Hicken, 2011). Indeed, the political organization that could sustain such political exchange need not be the party; it may very well be the personal ties among politicians such as ethnic affinities, tribal background, or clan affiliations.

Such characterizations of political exchange in the context of democracies with weakly-institutionalized party systems suggest a prediction about how distribution might unfold:

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[46]But, see Kasara (2007) for an example of when ethnic ties result in a reduction in favorable policies.

[47]On how mayors are able to mobilize support at the grassroots level in the Philippines, see Agpalo (1972); Hollensteiner (1963); Kawanaka (2002); Villanueva et al. (1966) and Wolters (1984). On more theoretical treatments of how the local politician-voter linkage may be sustained, see Magaloni, Diaz-Cayeros and Estevez (2007); Medina and Stokes (2007); Robinson and Verdier (2002) and Stokes et al. (2013).

upper-level politicians who have the power to redistribute will favor politically aligned local leaders. Broadly speaking, in the absence of stable party systems and an electorate with strong partisan affinities, the political calculations that direct spending and public goods provision are a function of the political organization (in this case, the ties between upper-level and local politicians) that sustains the exchange of redistributive benefits for electoral support.

In short, party relationships may matter, but not in the way much of the literature describes. Politicians are not making allocation decisions based on information about loyalty or marginality (either at the group or district level); partisan cues simply do not exist or are too weak a predictor of voter sentiment and behavior to be meaningful. Instead, national-level politicians are motivated by the need to mobilize voters. They might try to persuade individuals or groups to support them through direct appeals, but they will also try to mobilize voters by allocating resources to local politicians with networks necessary for voter mobilization. Allocation decisions, then, hinge on calculations about the risk that local politicians will accept resources but then shirk in some fashion and fail to mobilize voters (e.g. by not working as hard as needed, pocketing funds, working on behalf of multiple candidates, etc.). Given this risk, national politicians rely on cues that signal lower risk. Among these could be shared party affiliation. But in weakly-institutionalized party systems, other cues such as clan ties may be even more important.

This logic builds on a growing number of studies that demonstrate the importance of non-partisan political connections in predicting the distribution of public goods and services. For example, Caeyers and Dercon (2012) find that Ethiopian households with close connections to local public officials are more likely to receive food aid than those households without such connections. Besley, Pande and Rao (2012) show that political connections shape the distribution of local public goods to Indian villages. These and similar studies tend to focus on the link between local politicians/officials and local recipients of benefits, whether individuals or villages. In contrast, we focus on how non-partisan political connections

between national and local *politicians* can shape the distribution of resources.

The Philippines offers an ideal environment in which to assess the relative effects of party and clan ties. The Philippines has one of the oldest democracies in Asia, but also one of the weakest, underdeveloped party systems in the region. Philippine parties are highly factionalized and undisciplined. Party switching has been a recurring phenomenon in the Philippines, with about 40% of incumbent congresspersons switching their party affiliation from one election to the next since the beginning of its democratic period in 1946 (Kasuya, 2009). Moreover, party labels carry little weight for either voters or candidates, as evidenced by the high level of electoral volatility from election to election. In the words of one scholar: "Far from being stable, programmatic organizations, the country's main political parties are nebulous entities that can be set up, merged with others, split, resurrected, regurgitated, reconstituted, renamed, repackaged, recycled or flushed down the toilet anytime" (Quimpo, 2005).

In contrast to the unstable party system, a defining and enduring feature of political life in the Philippines are political clans. Political clans have dominated national and local politics historically and clan ties continue to shape modern Filipino politics and business (Coronel et al., 2007; Cullinane, 2003; Gutierrez, Torrente and Narca, 1992; Hutchcroft, 1998; Querubin, 2014*a,b*; Sidel, 1999; Simbulan, 2005). In fact, family relationships and rivalries generally have proved more robust than partisan differences. Descriptions about the influence of clan politics on public policy abound.[48] In a recent study, for example, Labonne and Fafchamps (N.d.) find that those with connections to current local office-holders are more likely to land well-paid government jobs.

However, estimating the causal effect of clan-based alliances on distribution is challenging because it is difficult to derive plausible exogenous variations in clan-based political alliances. It is possible that the very factors that explain why clan politics are strong in some areas also account for distributional patterns. Put differently, clan alliances may be endogenous

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[48]For several examples, see Gutierrez, Torrente and Narca (1992)

to distributional patterns. We attempt to address this issue by focusing on the geographical allocation of disaster reconstruction funds. Because our measure of typhoon exposure is exogenous to clan politics or prior distributions of government resources, controlling for the same variable can account for an important time-varying factor that confounds the relationship between clan ties and distribution. This, combined with a fixed-effects regression specification, should bring us closer to plausible causal estimates of the effect of clan ties on distribution.

In the next section, we describe our strategy for using storm damage to produce a baseline against which we can measure politically-motivated distribution.

4.3 NATURAL DISASTERS AS A DISTRIBUTIVE BASELINE

Stories and scandals abound regarding the particularization of the public purse.[49] However, moving beyond anecdote and allegation has been challenging for researchers. How do we estimate the extent to which political calculations play a role in the distribution of public goods? Very rarely do we have good records of policy deliberations and so we are unable to observe what arguments were put forward in favor of a particular distributive solution versus another. Furthermore, even where such records are available, they rarely present a clear picture. Politicians will cite many legitimate reasons for why a particular good or service should be allocated to their constituents–e.g. helping the poor, promoting investment–but seldom are they explicit about the political motivations behind their proposals. (At the same time, they are eager to claim credit for any goods and services the government provides). But, if we assume that almost all politicians are at least partially motivated by a desire for reelection (or, as is often the case in the Philippines, for the election of their family members),[50] then we begin to see the possibility of pork everywhere. And, in fact, one

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[49]For a recent example in the Philippines, see: http://world.time.com/2013/09/11/philippines-pork-barrel-graft-probe-has-lawmakers-squealing/

[50]Many offices in the Philippines are term-limited. Given this constraint, a common tactic is to attempt to pass offices from incumbents to other family members (e.g. spouses, children, siblings).

constituency's wasteful pork barrel project is often another's much needed public goods investment.

What we often lack is a clear, objective counterfactual–a baseline we can use to gauge how far a given policy departs from some sort of non-political, technocratic ideal (Golden and Min, 2013). Damage from natural disasters provides a reference point for this comparison by introducing a shock into the system. While not completely random (typhoons are more of a concern for the Philippines than for Poland), the precise number, timing, scale, and location of natural disasters are impossible to determine very far in advance. Furthermore, large-scale disasters affect a large number of locales and some locales more than others. (Locations at the epicenter of an earthquake, for example, will experience more damage than those further away). The fact that natural disasters cannot be fully anticipated means that governments will almost always need to respond to those disasters with supplemental relief and reconstruction funds targeted to disaster areas, giving researchers an opportunity to observe how such funds are distributed. Where we have information about the extent of damage across locales, it is possible to estimate how relief funds *should* be distributed if need-based technocratic criteria were the primary driver, and then observe how far from that baseline governments stray.

Analyzing the political economy of disaster response is a growing trend. Researchers have explored both political motivations for disaster relief (Aldrich, 2010; Garrett and Sobel, 2003; May, 1985; Platt, 1999; Salkowe and Chakraborty, 2009) and the political outcomes of providing these resources (Chen, 2013; Cole, Healy and Werker, 2012; Gasper and Reeves, 2011; Healy and Malhotra, 2009). Most of this research, however, focuses on the U.S. context[51] and considers political calculations based on politician-voter dynamics. Our paper contributes to this literature by evaluating how political connections *between politicians* influence a government's disaster response efforts.

We focus our analysis on the Philippines where large-scale natural disasters are, unfortu-

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[51]See Aldrich (2010) and Cole, Healy and Werker (2012) for examples of political calculations in disaster relief spending in India.

nately, commonplace. Each year, the country experiences an average of U.S. $17-19 billion in economic losses due to natural disasters (Dumitru, 2009). This equates to just under 10% of the Philippines' GDP. Local and national government funds dedicated exclusively to disaster assistance total around $14 billion annually. Typhoons and tropical storms are a particular concern. On average, twenty typhoons and tropical storms strike the Philippines each year, affecting nearly every part of the country (see Figure 12).[52] While disastrous for Filipinos, the frequency and distribution of storm activity and the scope of affected municipalities provide us with a rich source of data from which to test hypotheses about the influence of political connections on disaster response.

4.4 THE POLITICS OF DISASTER ASSISTANCE

A politician in the Philippines (or elsewhere) with the power to allocate a certain amount of disaster assistance in her district will likely consider several factors. One consideration is presumably the comparative level of need (or the extent to which a particular area has been devastated relative to other areas). This leads to our first hypothesis:

Hypothesis 1: The amount of per capita reconstruction funds distributed to a given area is positively related to the extent of storm damage in that area.

While we expect that damage assessments will help drive allocations decisions, we also expect political considerations to have an effect on those decisions. Politicians interested in reelection should use disasters, and their control of reconstruction funds, in ways that help improve their chances of remaining in office. This might include relatively innocuous activities like plastering the politician's name or picture on relief supplies handed out to disaster victims, or outright corruption–e.g. diverting disaster funds into personal or campaign coffers.

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[52]The darkest areas in Figure 12 experienced 26 storms during this period while the lightest areas experienced zero.
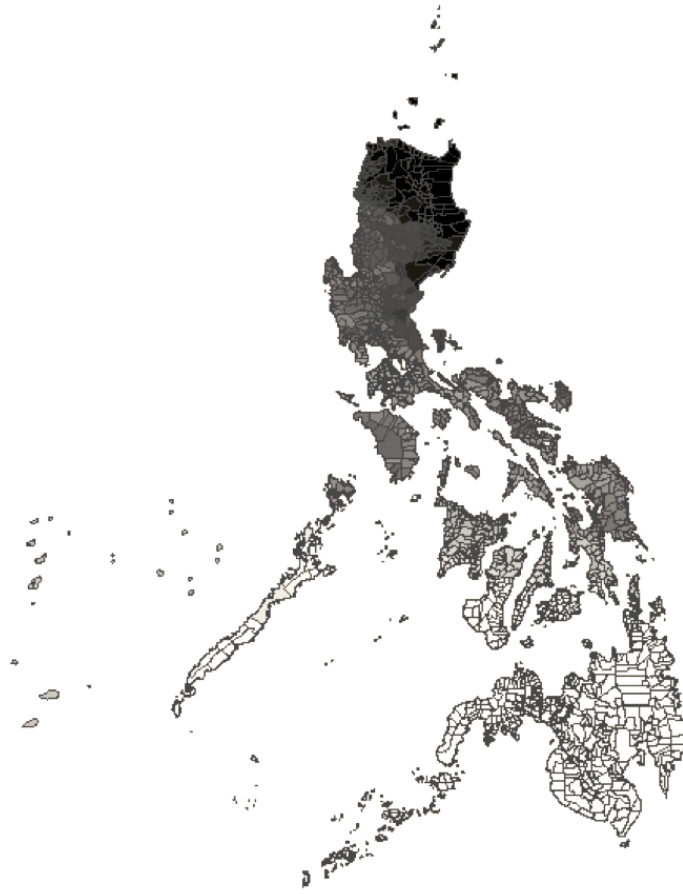
Figure 12: Typhoons and Tropical Storms per Municipality, 2001-2010.

We are particularly interested in whether political ties affect the flow of reconstruction funds and, if so, which kinds of relationships exert the most influence over distribution decisions. In a post-disaster situation, politicians are faced with the task of dividing their scarce resources between several damaged areas. Given two areas that are the same in every way–same level of damage, same population, same amount of economic activity, etc.–except that one area is controlled by a political ally, while the other is not, we hypothesize that politicians will favor the area controlled by the ally. The Philippines is replete with anecdotal examples of non-disaster-related distribution decisions being based on such alliances. For example, the desire to put oneself in a position to receive presidential pork produces massive switching to the president's party by members of Congress, governors and mayors after each election (Banlaoi and Carlos, 1996; Hicken, 2009). Furthermore, members of Congress and local government officials regularly make the distribution of government goods and services contingent on the recipient's political support (Cruz and Cruz, 2004a,b). We expect to see a similar pattern in the distribution of disaster assistance, hence the next hypothesis:

> *Hypothesis 2a: All else equal, areas controlled by political allies should receive more per capita reconstruction funds than other areas.*

More specifically, we are interested in exploring two kinds of alliances. First, do party ties play a role in allocation decisions? If party ties play a role, then those areas where a congressperson and mayor share partisan ties should receive disproportionate attention in the wake of a disaster.[53]

> *Hypothesis 2b: All else equal, areas controlled by partisan allies should receive more per capita reconstruction funds than other areas.*

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[53]In future work, we plan to look at ties to the president as well. Recent scandals suggest that the allocation of calamity funds by the president is also a politicized process (See SONA Failed to Chart Course, says minority. Business World, 27 July 2010). In his 2010 state of the nation address, President Aquino noted that the province of Pampanga–the second district of which outgoing President Arroyo now represents in Congress–received a large portion of the budget designated for national calamities, with the majority for that province (105 million pesos of the 108 million pesos) going to her district. He also noted that province Pangasinan only received 5 million pesos, even after being ravaged by typhoon Cosme in 2008.

In addition to partisan ties, we are interested in whether family or clan relationships will play a role in distribution decisions.[54] Furthermore, our expectation is that clan ties trump party ties when it comes to the politics of disaster aid. This leads us to our next two hypotheses:

> *Hypothesis 2c: All else equal, areas controlled by members of the same clan should receive more per capita reconstruction funds than other areas.*

> *Hypothesis 3: All else equal, clan ties should be a stronger predictor of distributed per capita reconstruction funds than partisan ties.*

4.5   RESEARCH DESIGN

We now turn to the task of determining the extent to which political calculations direct the redistribution of disaster reconstruction funds. Specifically, we test the hypothesis that the allocation of reconstruction funds across Philippine municipalities is a function not only of typhoon exposure (the amount of damage) but also of political ties between members of Congress and municipal mayors. Our main econometric specification is as follows:

$$reconstruction_{jt} = \beta_0 + \beta_1 typhoon_{jt} + \beta_2 party_{jt} + \beta_3 clan_{jt} + \beta_4 income_{jt} +$$

$$\beta_5 congressvote_{jt} + \beta_6 mayorvote_{jt} + \Omega_j + \epsilon_{jt} \quad (6)$$

where $reconstruction_{jt}$ is the per capita reconstruction funds allocated by a given congressperson to municipality j in year t, $typhoon_{jt}$ is a measure of typhoon exposure of municipality j in year t, $party_{jt}$ is a dummy variable indicating 1 if the congressperson and mayor are from the same party and 0 otherwise, and $clan_{jt}$ is a dummy variable indicating 1 if the congressperson and mayor are from the same clan and 0 otherwise.

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[54]We are assuming here that party and clan ties are useful proxies for political alliances. However, there are certainly examples of competition and outright feuding between members of the same party or clan. Such feuds should bias against our hypotheses, making it less likely that clan and party ties are significant predictors of reconstruction flows. The fact that we still observe support for our hypotheses, even with intra-clan and intra-party feuds introducing noise into the data, is reassuring.

We also include several control variables. The variable $income_{jt}$ is the per capita internal revenue allotment of municipality j in year t. The variables $congressvote_{jt}$ and $mayorvote_{jt}$ indicate the percentage of the total votes for a particular congressperson and mayor, respectively, in municipality j and year t. We include these two variables to proxy for swing versus core targeting strategy. This is an admittedly simple measure, but if politicians target their core supporters, we would expect a positive relationship between vote share and reconstruction fund distribution while if swing districts are the target, we would expect a negative relationship. Our expectation, however, is that voting patterns in the Philippines reveal very little about partisan preferences of either voters or candidates. If that is the case, then the vote share of either the congressperson or the mayor should be relatively useless for politicians as a valid measure of municipal partisanship and we should thus see no relationship between $congressvote$ or $mayorvote$ and the dependent variable.[55] Finally, the term Ω_j indicates municipality fixed effects. To ensure asymptotic consistency of the estimated standard errors, clustering is done at the municipal level.

Dependent Variable

Our main dependent variable is the per capita amount of annual congressional pork allocation that is spent on repairs and reconstruction of local infrastructures in a given municipality.[56] Each year, members of Congress receive lump sum allocations from the General Appropriations Act (GAA) known as the Department of Public Works and Highways - Congressional Allocations (DPWH-CA). Between 2001-2010, the total amount of annual DPWH-CA ranged between PHP 6.7-23.2 billion (roughly USD 156-540 million), which accounted for about 4% to 12% of the total national discretionary budget (i.e. total budget net of personal services,

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[55]In additional models, we 1) included margin of victory as a proxy for competitiveness (See Table 27 in the Appendix) and 2) controlled for the election year (See Model 11 in Table 26). Our results remain robust to these alternative specifications.

[56]We include years for which disaggregated data are available: 2001, 2003, 2004, 2005, 2009, and 2010. Data for years 2003, 2004, 2005, 2009, and 2010 comes from the Department of Budget and Management website (http://www.dbm.gov.ph/). Data for year 2001 comes from the Philippine Center for Investigative Journalism, which archived this previously published data that is no longer available online.

interest payments, and allotments to local government units). Within the same period, each district congressperson received annual DPWH-CA that ranged from PHP 2-50 million (USD 47,000-1.2 million).

These congressional allocations are not all spent on disaster-related repairs. The funds are also used for the construction and routine maintenance of public infrastructures such as schools, roads and bridges, and irrigation systems. However, on average, 64% of these allocations were spent on repairs and reconstruction and, in our analysis, we isolate and focus only on the portion of DPWH-CA that was spent on repairs and reconstruction.[57]

Looking at congressional pork that is spent on reconstruction funds has a number of advantages. To begin with, DPWH-CA has an "equal sharing" provision wherein every district congressperson, regardless of political affiliations, receives the same allocation as his or her colleagues in Congress every budget year.[58] Hence, we are able to observe the individual behavior of congresspersons within their districts, regardless of political affiliation or seniority. In contrast, presidentially-controlled calamity funds that are released during or immediately after a typhoon are not very well documented and could easily be the end result of (possibly conflicting) political calculations by politicians at different levels of government.

Another advantage is that even though all releases are made through the DPWH, which also administers the projects, congresspersons have the "power of the purse", that is, the authority to identify specific projects for a given location and to release the funds for that project. As a result, the process of releasing these funds is transparent in that we can identify the amount released to the local government unit.[59]

Focusing on congressional allocations for repair and reconstruction does have some unavoidable disadvantages. One is that we do not account for calamity funds that are under

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[57]We run the same analysis using DPWH-CA spent on construction of new infrastructure and we do not find any effect of typhoon exposure. See Table 28 in the Appendix.

[58]When and whether the allocation gets released or not, however, also depends on the approval of the President.

[59]Whether all funds released were actually spent on the project or pocketed as rents by the congressperson or the mayors or the DPWH bureaucrats is another matter.

the discretion of the President in our analysis.[60] A second disadvantage is that we are unable to establish whether the funds distributed to each municipality were actually spent on the project or pocketed by the local government officials. However, the likelihood that local officials misappropriate congressional funds or that political calculations play a role in the allocation of Presidential discretionary funds[61] implies that we may only be estimating a lower bound of how partisanships moderate the responsiveness of public goods provision to typhoon exposure.

Typhoon Index

Developing a standard baseline measure for determining how disasters affect different areas can be challenging. One measure commonly used to compare disaster levels across areas is the death toll. Poorer nations (and poorer regions in a nation), however, suffer significantly greater death counts than richer ones, which can lead to biased estimates of the intensity of the disaster in a given area (Stromberg, 2007). An alternative measure for comparing the impact of a disaster in one locale versus another is to use estimated damages. However, these measures also create biased estimates as wealthier nations may have sturdier buildings and infrastructure, which can limit the damage, but they also can experience significantly higher damage estimates because of the more expensive nature of the buildings and infrastructure affected. To circumvent for these potential biases, some research uses actual weather patterns (rather than human reporting) to estimate the extent of disaster damage (e.g. Cole, Healy and Werker (2012); Yang (2008)). Our approach follows in this tradition.

To create a baseline for the comparison of storm damage across municipalities, we adapt the methodology found in Yang (2008) and develop a typhoon index using data on tropical storms from the Japanese Meteorological Agency.[62] The storm data include best tracks

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[60]Unfortunately, detailed data on calamity fund distribution are not available.

[61]For instance, former President Gloria Arroyo is charged with plunder in the alleged misuse of the PHP 900 million Malampaya Fund that was meant for disaster rehabilitation and reconstruction in the wake of super typhoons "Ondoy" and "Pepeng" in 2009.

[62]Although we use a similar methodology to Yang (2008), we adapt his approach to develop sub-national, rather than national, levels of typhoon exposure.

of each storm, with date, time, location (latitude and longitude), windspeed, barometric pressure and type of tropical storm or typhoon. Data are collected along each storm track at 6-hour intervals. Figure 13 provides an example of the best tracks and corresponding data points of the storms that affected the Philippines in 2009.

We use these data to construct a typhoon index at the municipality-year level. The level of storm damage experienced due to a typhoon depends on several storm-related factors, most notably windspeed. Additionally, a typhoon is likely to cause more damage in areas of higher population concentration (with presumably more infrastructure that could be damaged). We use these assumptions to create a typhoon index for municipality j in year t as follows:

$$typhoon_{jt} = \frac{\sum_i \sum_s x_{isjt}}{N_{jt}} \tag{7}$$

The variable x_{isjt} measures the level of exposure for an individual i by storm s in municipality j and year t. The level of exposure is calculated as follows:

$$x_{isjt} = \frac{(w_{isjt} - 33)^2}{(w^{MAX} - 33)^2} \tag{8}$$

where w_{isjt} is the windspeed to which an individual was exposed (in knots) and w^{MAX} is the maximum windspeed in the data set, which is 125 knots.[63] Thus, this measure consists of the square of the windspeed above the tropical speed threshold (33 knots) experienced by a given municipality divided by the square of the maximum windspeed above the tropical speed threshold experienced by any municipality in the data set.[64] To construct the storm index, individual exposure is summed across all storms in a given year and across all individuals in the municipality, with the result divided by the municipality population, N_{jt}.

The typhoon index is essentially a measure of "intensity-weighted events per capita" (Yang, 2008). An index of 1 would occur if all of the residents in a given municipality were exposed to the highest intensity windspeed ($x_{isjt} = 1$) once in a given year. To construct the individual-level exposure variable, we use population data at the barangay level.[65] We use

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[63] 1 knot = 1 nautical mile per hour; 1 nautical mile = 1.15 land miles. Also, 33 knots is the minimum threshold for a storm to qualify as a tropical storm.

[64] The maximum windspeed in this data set occurred during typhoon Juan in 2010.

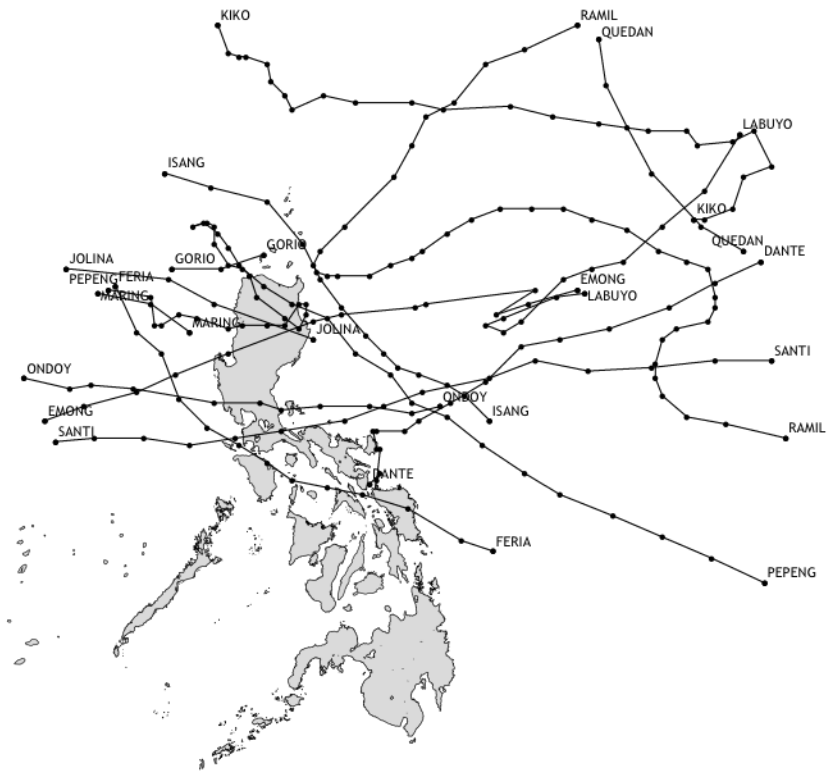[65] The 1623 municipalities in the Philippines are subdivided into 41,940 barangay.

Figure 13: Storm Tracks in the Philippines in 2009

the storm best-track data, a model of windspeed decay given distance from typhoon eyes, and geographic information systems software (ArcGIS 10.0) to estimate the windspeed experienced at each barangay for each separate storm (Dilley et al., 2005). This level of exposure is summed across all storms and population-weighted barangay (as opposed to individuals) by year. Table 24 presents the mean storm index for the most affected municipalities in the Philippines from 2001 to 2010. The municipality with the highest mean typhoon index is Divilican, in the province of Isabela. In 2010, the eye of the typhoon in the data set that reached the maximum windspeed (Typhoon Juan at 125 knots) moved through the center of this municipality (along with the second and third-highest municipalities on the list). Most of the barangay in Divilacan experienced the maximum force of 125 knots (while not experiencing any other typhoons that year). This resulted in a storm index near 1. If another typhoon of 125 knots had travelled through the center of the municipality of Divilican in 2010, the storm index would have been closer to 2. While the storm index has a lower bound of 0 (which is the value for many cities in southern Mindanao completely unaffected by typhoons during this period), the upper limit is unbounded.[66]

Political Variables and Methodology

Our measures of political ties include both partisan ties and family ties. 'Partisanship' is operationalized as the match in party affiliations of the incumbent district congressperson and the incumbent municipal mayor. 'Family ties' is the match in clan membership of the

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[66]One potential criticism of using storm severity as a predictor of need is the idea that municipalities that are more susceptible to disasters may have better disaster preparedness and mitigation policies and procedures. Thus, storm severity may not necessarily correlate with storm damage, and, therefore, with need. For example, we might expect some municipalities in Luzon, which suffer several typhoons each year, to erect buildings that are more wind resistant than buildings erected in southern Mindanao, where typhoons rarely make landfall. This type of preparedness, however, has competing effects on the extent of monetary damages in a given area (and, therefore, on the level of need). For less intense storms, wind-resistant construction techniques may help to minimize economic losses if the buildings prove resistant. However, the same attention to construction standards may increase economic losses if these more expensive buildings are unable to withstand a major storm. Thus, the relationship between disaster preparedness and disaster impact is not necessarily linear. Nevertheless, to account for the discrepancy in levels of disaster preparedness between municipalities (along with other factors potentially unaccounted for), we include municipality fixed effects in our statistical analysis.

Table 24: Typhoon Index for Most Affected Municipalities

Year	Municipality	Province	Typhoon Index
2010	Divilacan	Isabela	0.9895
2010	Tumauini	Isabela	0.9596
2010	Maconacon	Isabela	0.9465
2010	Ilagan (Capital)	Isabela	0.8962
2006	Dilasag	Aurora	0.8391
2010	San Pablo	Isabela	0.8279
2006	Casiguran	Aurora	0.8205
2010	Santo Tomas	Isabela	0.8158
2010	Cabagan	Isabela	0.8071
2010	Delfin Albano (Magaysay)	Isabela	0.8071

same politicians. To determine party affiliations and clan membership, we use electoral data relevant for our period of study from election years 2001, 2004 and 2007, obtained from the Commission on Elections (COMELEC).

Within these election periods, there were 37 unique party affiliations of winning congresspersons and 58 unique party affiliations of winning mayors. Politicians in the Philippines typically run under several party names, either to signify affiliations with a national party and a local party (e.g. DIMASALANG/LAKAS-CMD), or to signify affiliations with an ad hoc pre-election coalition among national parties (e.g. LAKAS-NUCD/UMDP). To determine the partisan ties between a municipal mayor and her respective district congressperson, we create a variable called 'partisanship' which takes on a value of 1 if the congressperson's party affiliation matched with the mayor's party affiliation and takes on a value of 0, otherwise.

For the second measure of political ties based on clan membership, we create a variable called 'family ties' and, following Querubin (2014a), we match not only last-names of the district congressperson and the municipal mayor, but also look at different combinations of last-names, mid-names, and husband's last-name (in the case of married women). This is done so as not to miss filial affinities through wives and female relatives. In any case, the results in this paper are very similar if family and relatives are only traced using last-names or mid-names.

A natural concern with the above method is that individuals from the same district who share a last-name, mid-name or husband's last-name may not necessarily be related by blood to each other. While certainly a possibility, Querubin (2014b) explains how this is less of a concern in the Philippines than in other countries because of how family names were historically distributed across different provinces. Specifically, in 1849, during the Spanish era, a different set of surnames was assigned to each town and local officials then assigned a different surname to each family head. Nevertheless, the possibility of measurement error remains. Fortunately, if our method frequently produces Type 1 errors (false positives) then this should bias *against* our finding support for our hypotheses about family ties.

4.6   RESULTS

Table 25 presents the effects of party affiliation between the congressperson and mayor on the distribution of per capita reconstruction funds. The results from Model 1 confirm Hypothesis 1 by showing a positive and significant relationship between the typhoon index (the amount of storm damage) and the amount of per capita reconstruction funds provided. This coefficient for the typhoon index is large, positive, and highly significant across all model specifications. An increase from 0 to 1 on the typhoon index results in an increase of approximately 250 pesos per person in reconstruction funds. For a municipality the size of Tacloban (221,174 people), which was one of the areas devastated the most by Typhoon Haiyan recently, an increase in the typhoon index from 0 to 1 would result in an increase in reconstruction funds of approximately PHP 55.36 million (USD 1.27 million).

Model 2 shows that a party match between the congressperson and the mayor in a given municipality increases the per capita reconstruction funds allocated to that municipality. The coefficient remains positive and statistically significant when controlling for the typhoon index in Model 3 and with the inclusion of additional control variables in Models 4 and 5, thus providing support for Hypothesis 2b. If a congressperson and mayor are from the same party, a city the size of Tacloban can expect an increase in total reconstruction funds of

Table 25: The Effect of Party Match on Per Capita Reconstruction Funds

	(1) Per Capita Repair Funds	(2) Per Capita Repair Funds	(3) Per Capita Repair Funds	(4) Per Capita Repair Funds	(5) Per Capita Repair Funds
Typhoon Index	248.32***		247.94***	250.04***	250.31***
	(62.89)		(62.79)	(62.08)	(62.23)
Party Match		9.20**	9.05**	9.06**	8.96**
		(4.44)	(4.44)	(4.40)	(4.52)
Per Capita Income				−0.01*	−0.01*
				(0.01)	(0.01)
Congressperson Vote Share					−6.46
					(17.02)
Mayor Vote Share					11.41
					(17.21)
Constant	68.71***	68.51***	64.34***	83.16***	80.48***
	(1.08)	(2.15)	(2.57)	(8.96)	(19.41)
N	7237	7237	7237	7237	7237

(1) All models include municipality fixed effects.

(2) Standard errors clustered at the municipality level are in parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

approximately PHP 1.98 million (USD 45,000).

The final two models in Table 25 include several control variables. As expected, per capita income has a negative and significant effect on the distribution of per capita reconstruction funds. As citizens in a given municipality become wealthier, the amount of per capita reconstruction funds distributed to that municipality declines. In Model 5, neither the vote share of the congressperson nor the vote share of the mayor yields a significant relationship with the amount of per capita reconstruction funds distributed. These results do not provide support for the targeting of funds to core or swing municipalities in the context of disaster relief in the Philippines.

The models in Table 26 consider the effect of clan ties between the congressperson and the mayor on the distribution of per capita reconstruction funds in a given municipality. Model 7 provides support for Hypothesis 2c. A match in the clan name significantly increases the amount of per capita reconstruction funds allocated to a municipality. This effect remains significant when controlling for the typhoon index in Model 8 and with the inclusion of additional control variables in Model 9. For a city the size of Tacloban, the presence of clan ties between the congressperson and the mayor would result in an additional PHP 6.23 million (USD 143,000) in per capita reconstruction funds.

The estimation of Model 9 provides results for the various control variables that remain consistent with the specifications found in Table 26. An increase in per capita income results in a significant decrease in the amount of per capita reconstruction funds distributed to the municipality. Furthermore, neither the vote share of the congressperson nor the vote share of the mayor has a significant effect on the distribution of per capita reconstruction funds. Finally, the typhoon index remains consistently positive, significant and large in Models 8 and 9.

Model 10 shows the results for the fully specified model and provides a test for our final hypothesis. The typhoon index and the two alliance variables remain positive and significant in the estimation of this model. The inclusion of both *party* and *clan* in Model 10 allows

Table 26: The Effect of Clan Match on Per Capita Reconstruction Funds

	(6) Per Capita Repair Funds	(7) Per Capita Repair Funds	(8) Per Capita Repair Funds	(9) Per Capita Repair Funds	(10) Per Capita Repair Funds	(11) Per Capita Repair Funds
Typhoon Index	248.32***		248.01***	250.14***	250.10***	244.52***
	(62.89)		(62.86)	(62.25)	(62.20)	(63.42)
Family Match		31.14**	30.75**	31.50**	28.19*	28.23*
		(15.33)	(15.55)	(16.02)	(16.59)	(16.55)
Per Capita Income				−0.01*	−0.01*	−0.01*
				(0.01)	(0.01)	(0.01)
Congressperson Vote Share				−4.04	−6.40	−7.23
				(17.07)	(17.02)	(16.95)
Mayor Vote Share				12.77	10.95	10.93
				(16.87)	(17.19)	(17.20)
Party Match					7.85*	7.90*
					(4.69)	(4.69)
Election Year						4.08
						(3.53)
Constant	68.71***	71.47***	67.25***	81.03***	80.04***	77.04***
	(1.08)	(0.73)	(1.21)	(19.63)	(19.43)	(19.82)
N	7237	7237	7237	7237	7237	7237

(1) All models include municipality fixed effects.

(2) Standard errors clustered at the municipality level are in parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

us to test Hypothesis 3, which states that the effect of clan ties between the congressperson and mayor on the distribution of per capita reconstruction funds will be greater than the effect of party ties between these politicians. The coefficient on clan ties is nearly 4 times the size of the coefficient on party ties, which provides some evidence supporting this final hypothesis.[67]

The results for clan affiliation are consistent with the findings elsewhere in the literature on the importance of non-partisan linkages (e.g. ethnic or tribal ties) for allocation decisions in countries with weak party systems (Eifert, Miguel and Posner, 2010). Where party affiliations are weak and ephemeral, politicians can and do make use of alternative networks to guide the distribution of government goods and services. Family ties are among the least risky and most effective institutions through which the political exchange of distributive benefits for electoral support is possible, so it should not be surprising that dynastic politics, rather than party politics, is pervasive in many countries.

It is important to note, however, that party ties still have a significant effect in our fully specified model, which controls for clan ties. Thus, even in the Philippine context where party affiliation is fluid, parties still matter in the distribution of reconstruction funds. Parties, however, are not important in the process of identifying areas of core voters (as evidenced by the insignificance of the vote share variables). Instead, it appears that parties (like clan ties) provide another opportunity for upper-level politicians to identify lower-level allies with whom they can engage in exchanging funds for the mobilization of voter support.

One potential concern with our model specification is that government responses to disasters may differ during years in which an election occurs. Previous research suggests that government spending on disaster relief just prior to an election has a greater effect on voting behavior than allocations in earlier periods (Cole, Healy and Werker, 2012). Thus, years in which an election occurs may be driving our main results. In Model 11, we include a dummy for election years and re-estimate our fully specified model. The coefficient for *election* is

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[67]A Wald test, however, does not provide evidence that the two coefficients are statistically different from each other, thus weakening the support for this hypothesis.

positive, but fails to reach statistical significance. More importantly, the coefficients on our remaining variables of interest remain positive and statistically significant, thus indicating that political connections matter throughout the election cycle.

4.7 CONCLUSION

In this project, we analyze whether connections between politicians influence disaster response. Our theory states that upper-level politicians distribute funds to lower-level political allies in a classic exchange of funds for political support. We produce a baseline estimate for post-disaster need by calculating a storm exposure measure for every municipality in the Philippines from 2001-2010. Then, we analyze the effect of political connections on the distribution of reconstruction funds from members of the Philippine Congress to mayors in their districts. Our analysis shows that both storm exposure and political connections, especially clan ties, increase per capita reconstruction funds allocated to a given municipality.

4.8 APPENDIX

Table 27: The Effect of Party & Clan Match on Per Capita Reconstruction Funds (with competitiveness variable)

	(1) Per Capita Repair Funds	(2) Per Capita Repair Funds	(3) Per Capita Repair Funds
Typhoon Index	250.24***	250.54***	250.06***
	(62.04)	(62.09)	(62.00)
Party Match	8.96**		7.82*
	(4.38)		(4.57)
Family Match		31.87**	28.47*
		(16.00)	(16.61)
Per Capita Income	−0.01*	−0.01*	−0.01*
	(0.01)	(0.01)	(0.01)
Win Margin	1.52	3.18	1.76
	(9.77)	(9.78)	(9.77)
Constant	82.65***	85.01***	81.90***
	(10.23)	(10.85)	(10.31)
N	7237	7237	7237

(1) All models include municipality fixed effects.

(2) Standard errors clustered at the municipality level are in parenthesis.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 28: The Effect of Party & Clan Match on Per Capita Construction Funds

	(1) Per Capita Construction Funds	(2) Per Capita Construction Funds	(3) Per Capita Construction Funds
Typhoon Index	62.89	62.79	62.75
	(44.95)	(44.94)	(44.92)
Party Match	7.92**		7.14**
	(3.18)		(3.35)
Family Match		22.78	19.76
		(14.43)	(14.91)
Per Capita Income	0.01**	0.01**	0.01**
	(0.00)	(0.00)	(0.00)
Congressperson Vote Share	−20.66**	−18.47**	−20.62**
	(8.89)	(8.85)	(8.86)
Mayor Vote Share	2.85	4.17	2.52
	(7.02)	(7.02)	(6.98)
Constant	34.20***	34.80***	33.90***
	(8.33)	(8.51)	(8.40)
N	7236	7236	7236

(1) All models include municipality fixed effects.

(2) Standard errors clustered at the municipality level are in parenthesis.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Chapter 5

Conclusion

5.1 THE WORK

This dissertation analyzed the motivations of governments, both foreign and domestic, in responding to natural disasters. Chapter 2 explained that certain donors provide relief aid to seemingly non-strategic recipients because this action signals (to the international community) a commitment to the broader international public good. Donors with high geopolitical influence benefit more from signaling their humanitarianism due to their engagement in a broader range of multilateral policy negotiations. As a result, these donors are more likely (compared to low geopolitical influence donors) to provide relief aid to non-strategic recipients.

In chapter 3, I explained how donor types and recipient democratic institutions interact to affect the type of aid delivery channels used to distribute relief aid. Donors who give for humanitarian reasons prefer to provide bilateral aid to democratic recipients who they believe will help facilitate the disbursal of aid according to the true needs of their citizens. Conversely, donors who give for strategic reasons prefer to give bilateral aid to less democratic recipients who they believe are more likely to provide policy concessions in exchange for aid.

Chapter 4 explained how connections between upper-level and lower-level politicians affect the flow of reconstruction funds in the Philippines. Following a disaster, national-

level politicians in weak-party systems try to maximize votes by providing resources to local politicians with networks necessary for voter mobilization. In this context, both party and clan ties are important predictors of the distribution of reconstruction funds.

5.2 THE CONTRIBUTION

Each part of the dissertation project contributes to some understanding of the influence of politics in government responses to disaster. In chapter 2, I provide a unifying theory of relief aid distribution which differs from earlier work on foreign aid by incorporating heterogeneous donor preferences into a systematic empirical analysis of 18 donor nations. Furthermore, I use principal component analysis to develop composite measures of concepts such as geopolitical influence, humanitarian need, and bilateral strategic interests. These composite measures allow for an analysis of how each of these broader concepts might impact patterns of disaster relief giving. Finally, I provide empirical results that reveal differences in the strategic approaches to relief aid distribution for the largest bilateral donors based on their level of geopolitical influence.

In chapter 3, I develop a method for differentiating donor types based on their responsiveness to natural disaster impact. Furthermore, I show that incorporating the preferences of different donor types helps explain the competing theoretical predictions and mixed empirical results concerning the effect of recipient democratic institutions on aid distribution patterns (Alesina and Dollar, 2000; Bueno de Mesquita and Smith, 2007, 2009; Burnside and Dollar, 2000; Fink and Redaelli, 2011; Heinrich, 2013; Raschky and Schwindt, 2012; Svensson, 1999; World Bank, 1998).

In chapter 4, we contribute to both academic and policy debates about disaster relief. First, we develop a novel methodological approach using storm track damage estimates to produce an apolitical baseline estimate of post-disaster need. Next, we demonstrate that even in weak party systems, party ties matter. Furthermore, we provide systematic evidence that clan ties are strong predictors of relief aid patterns. Finally, our analysis speaks to the

importance of decoupling disaster assistance from political influence.

5.3   THE FUTURE

The research presented in this dissertation yields several interesting avenues for future work. In chapter 2, for example, I argue that donors respond to humanitarian need for several reasons including domestic political pressure, economic opportunities in reconstruction, and a lower purchase price for potential policy concessions. One potential extension of this project could analyze the extent to which each of these mechanisms mediates the impact of humanitarian need on the provision of aid. Also, previous research has shown that domestic political ideologies affect the level of official development aid provided by donor countries (Fleck and Kilby, 2006; Milner and Tingley, 2010; Tingley, 2010). Thus, a second avenue for research could analyze how domestic politics affects the extent to which donors respond to both measures of humanitarian need and bilateral strategic interests. Finally, a proliferation of research has studied the effects of foreign aid on a variety of outcomes in the recipient country, with sometimes conflicting results (Boone, 1996; Burnside and Dollar, 2000; Easterly, 2003; Easterly, Levine and Roodman, 2004; Burnside and Dollar, 2004; Knack, 2004; Remmer, 2004). But these studies all look at aggregate aid flows without considering the type of donor providing the aid. If donors have different strategies for providing relief aid, then the respective impact of relief aid on relevant outcomes following disasters, including a full economic recovery, may differ accordingly.

The analysis in chapter 3 also provides several promising areas for continued work. One possible extension would be to compare the highly democratic OECD donors with some of the less democratic donors to determine whether *donor country* democratic institutions influence the provision of bilateral aid via the same mechanisms described in this project. A second possibility would be to compare state donors with multilateral and NGO donors to determine if preferences are heterogeneous between as well as within each of these groups of donors. Finally, the methodology presented in this project for distinguishing donor types

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has applications in the broader foreign aid literature. One such example would consider the donor preferences and subsequent channeling of aid in civil war conflicts to determine impacts on duration and outcome. Accounting for donor heterogeneity in the giving preferences of donors, therefore, has the ability to clarify our understanding of the impact of foreign aid on a variety of outcomes.

From chapter 4, we can identify several areas for future research. First, we can extend the analysis to explore the extent to which political ties between the President and lower-level politicians shape disaster reconstruction allocation. While the current project only considers funds for which the Philippine Congress has the "power of the purse," we also could consider funds (such as the calamity funds) for which the President has allocation discretion. Given that most of the research on disaster politics looks at the influence of either the executive or the legislature, this interaction between multiple levels of government (national and local) as well as multiple branches of the national government could provide a better understanding of the distributional complexities of post-disaster aid. Second, we can extend the analysis to other countries with weak party systems to identify whether additional ties between upper-level and lower-level politicians (such as economic ties) might substitute for partisanship.

Finally, a methodological extension of the research in this dissertation is to reassess how we measure government responses to disasters. The typical approach in the study of political economy is to "follow the money." In line with this approach, I used relief aid flows between national governments in chapters 2 and 3 and reconstruction fund flows between levels of the Philippine government in chapter 4. One problem with this approach in the context of disaster relief (and, perhaps, other policy areas) is that just because government officials allocate money to a given area does not mean the citizens of that area receive the benefits of that allocation. It is possible that those benefits accrue disproportionately to local government officials. Thus, we may want to determine an objective and comparative way to measure the actual recovery outcomes for disaster victims.

One way to measure recovery outcomes (rather than money allocation) is to use geo-

graphical information systems (GIS) data to help identify a government's effective response to natural disasters. Aubrecht et al. (2009), for example, uses images from the U.S. Air Force Defense Meteorological Satellite Program (DMSP) Operational Linescan System (OLS) to observe power blackouts from space and tracks the recovery of electricity following several major natural disasters using successive daily images. To develop a more accurate understanding of the actual recovery outcomes experienced by victims, we can observe time to recovery across relatively small (1 km^2) geographical units. Furthermore, we can compare recovery times in a given area with common political variables designed to predict distribution patterns (e.g. votes or political ties) to determine the political influences on disaster recovery. As a result, we may improve our understanding of whether money allocated to certain areas actually results in improvements for the citizens who need it most (rather than resulting in improved outcomes for just the local politicians receiving the allotment).

The influence of politics in government responses to natural disasters is an important avenue for continued research. The United Nations Intergovernmental Panel on Climate Change (IPCC) identifies numerous impacts associated with small changes in global mean temperature (less than 1 degree Celsius) including "systemic risk due to extreme weather events leading to a breakdown of infrastructure networks and critical services such as electricity, water supply, and health and emergency services" (IPCC, 2014). Given that governments, both foreign and domestic, make choices about how to respond to these natural disasters, understanding why they respond in a certain way is critical. Once we account for the politics in government disaster response, the areas and peoples most vulnerable to marginalization and neglect will (hopefully) receive the help that they need by those donors (government or otherwise) less susceptible to political influence.

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