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International Interactions: Empirical and Theoretical Research in International Relations

Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/gini20

From Tremors to Talks: Do Natural Disasters Produce Ripe Moments for Resolving Separatist Conflicts?

Joakim Kreutz [a]

[a] Department of Peace and Conflict Research , Uppsala University

Accepted author version posted online: 30 May 2012.Published online: 15 Aug 2012.

To cite this article: Joakim Kreutz (2012) From Tremors to Talks: Do Natural Disasters Produce Ripe Moments for Resolving Separatist Conflicts?, International Interactions: Empirical and Theoretical Research in International Relations, 38:4, 482-502, DOI: 10.1080/03050629.2012.697404

To link to this article: http://dx.doi.org/10.1080/03050629.2012.697404

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International Interactions, 38:482–502, 2012
Copyright © Taylor & Francis Group, LLC
ISSN: 0305-0629 print/1547-7444 online
DOI: 10.1080/03050629.2012.697404

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From Tremors to Talks: Do Natural Disasters Produce Ripe Moments for Resolving Separatist Conflicts?

JOAKIM KREUTZ
Department of Peace and Conflict Research, Uppsala University

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This article suggests that natural disasters can produce a ripe moment for conflict resolution because governments faced with the demand for effective disaster relief have incentives to offer concessions to separatist challengers. An analysis of the prevalence of new negotiations, ceasefires, and peace agreements during 12-month periods before and after natural disasters for separatist dyads 1990–2004 reveal some support for this proposition. Natural disasters increase the likelihood that parties will initiate talks or agree to ceasefires but have less effect on the signing of peace agreements. In line with the proposed mechanism, these results are particularly strong in democracies and following more severe disasters where the need to provide relief is most acute.

KEYWORDS civil war, natural disaster, negotiation, ripe moment

Scholars and practitioners concerned with how civil wars can be brought to an end commonly return to the importance of the "ripe moment." When parties to a conflict understand that they have more to gain from suing for peace than continued warfare, negotiations will begin, ceasefires will be announced, and peace agreements will be concluded. Yet we know little about the elusive concept of "ripeness" as the term often is used tautologically: the evidence that a conflict is ripe for resolution is that it has been successfully resolved. This problem is particularly pertinent when the logic

Funding for this project was provided by the Human Security Report Project/Department for International Development, UK (DFID). Thanks to Kristine Eck, Nina von Uexkull, Halvard Buhaug, Magnus Öberg, the journal editors, two anonymous reviewers, and participants at the Department of Peace and Conflict Research seminar for useful comment on earlier versions of this essay.

Address correspondence to Joakim Kreutz, P.O. Box 514, SE-751 20 Uppsala, Sweden. E-mail: Joakim.Kreutz@pcr.uu.se

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of ripe moment theory is explored as an effect of external shocks. Because of the high-profile nature of such events, their influence on ensuing successful conflict resolution processes is often highlighted in media and policy reports and can be found in academic research as well (Beardsley and McQuinn 2009; Enia 2008; Le Billon and Waizenegger 2007), yet this relationship has not been systematically tested. For example, it is commonly suggested that the devastating Indian Ocean tsunami in late 2004 paved the way for the peace agreement signed in August 2005 that settled the separatist conflict in Indonesian Aceh. However, other accounts point out that the Indonesian government and GAM rebel representatives met in October 2004, and that secret peace talks began on 24 December 2004, two days before the tsunami disaster hit (Gaillard, Clavé, and Kelman 2008), evoking the suspicion that peace could have been achieved anyway. Thus, without subjecting the relationship between natural disasters and peacemaking to systematic testing, it is impossible to draw conclusions about whether disasters create a window of opportunity for conflict resolution or not.

In this article, I revisit ripe moment theory and explore whether external shocks in the form of natural disasters can produce conditions for the successful settlement of internal separatist conflict. The idea that events external to the conflict itself can force belligerents to re-evaluate the costs and benefits of continued fighting is central to the literature on conflict resolution (Mitchell 1995). Such events can be imposed by third parties in the form of sanctions—military, political, or economic—as well as offers of future rewards for a change of policy. It has also been suggested that the experience of natural disasters can provide a "ripe moment" for conflict resolution. Drawing on recent iterations of ripeness theory, I argue that governments will be more willing to negotiate with separatist challengers when faced with public demands that resources be allocated toward disaster relief.

Empirically, this article adds to the scholarly work on the disaster-conflict nexus by systematically exploring the idea that the aftermath of disaster may provide a window of opportunity for the termination of warfare. By focusing on three aspects of peacemaking—the onset of talks, ceasefires, and the signing of peace agreements—this study adds to a growing field of quantitative studies focusing on the risk for political violence following disaster (Ahlerup 2009; Brancati 2007; Nel and Richards 2008; Olson and Drury 1997; Omelicheva 2011; Slettebak 2012).

In my analysis, natural disaster events are used as a treatment in a quasi-natural experiment that compares the likelihood of the onset of talks, the agreement of ceasefires, and the conclusion of peace settlements in the 12 months immediately prior to and after a natural disaster. Focusing on only the countries that experience natural disasters is advantageous to a traditional country-year approach, as this design addresses the risk that findings are influenced by unobserved factors that may vary between disaster-prone

areas and elsewhere. Drawing on global data for 1990–2004, 405 natural disasters are identified in 21 countries where governments have been faced with 50 different separatist challengers. The findings from the empirical analysis provide support for the proposed relationship that natural disasters provide a ripe moment for conflict resolution. There is an increased likelihood that talks are initiated and that ceasefires are agreed in the immediate aftermath of a natural disaster. In line with theoretical expectation that governments offer concessions to challengers when faced with increased demand to reallocate resources toward disaster relief, this is particularly likely for democratic governments and following more severe disasters. The findings indicate, however, that natural disasters do not have any statistically significant effect on the likelihood that a peace agreement is concluded. As conflicts that end without a clear settlement have a greater risk of relapse (Kreutz 2010), this finding is a cause for some concern: the aftermath of disasters may temporarily stop hostilities but does not lead to a formalized settlement of the conflict issues.

The article is organized as follows. In the next section, I revisit ripe moment theory to identify the mechanism through which a natural disaster event can lead to the onset of talks, ceasefires, or peace agreements. This is followed by a presentation of the data used for the analysis and statistical technique. The next section tests ripeness theory and its component parts on the three dependent variables. Finally, the paper concludes with a discussion on the theoretical and policy implications of these findings.

RIPE MOMENT THEORY AND DISASTER DIPLOMACY

Ripeness is an attractive concept because it originated within a rational choice approach to armed conflict while also prescribing a path for external actors to promote conflict resolution. At its core is the assumption that belligerents involved in armed conflict are rational and determine their course of action following a cost-benefit analysis of available strategies. Mason and Fett (1996:547) summarizes the rational choice model of civil war resolution as follows:

> For the incumbent government and a rebel organization to agree to a negotiated settlement at some point in the conflict rather than continue to pursue a military victory at some point in the future, it must be the case that [. . .] their subjective estimate of the expected utility of a negotiated settlement is greater than their subjective estimate of the expected utility from continuing the conflict.

Ripeness theory specifies that negotiations will start when the conflict is ripe for resolution, which means that the parties view settlement as preferable

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to continued violence. In the words of Zartman (2001:8): "parties resolve their conflict only when they are ready to do so—when alternative, usually unilateral means of achieving a satisfactory result are blocked and the parties feel that they are in an uncomfortable and costly predicament." There is an intuitive appeal to this logic and experienced mediators regularly confirm the importance of timing in determining the outcome of a peace process.[1]

As an analytical tool, however, the value of the ripeness concept has been debated (see Kleiboer 1994; Pruitt 2005). This debate has focused on two aspects: (1) the difficulty of devising an empirical application without using the term tautologically, and (2) that the microfoundations of the theory are underdeveloped. While I propose a way to address the former in the methodological section, I first focus on the latter problem by suggesting a mechanism through which natural disasters can create a ripe moment for conflict resolution.

In its original form, the scope conditions of ripeness theory focused on the *dyadic* relationship of the belligerents and pre-supposed their joint acknowledgement of a mutually hurting stalemate (Zartman 1985). Shortcomings of the dyadic approach include the difficulty of addressing situations which both parties find costly, but which impact them differently because of asymmetric power or future anticipated shifts in power relations. Ripeness, it is argued, should be seen as a scale rather than as an absolute state. To address this, modern applications of the theory have focused on the psychological aspect of the concept and argued that since "ripeness is necessarily a perceptual event" (Zartman 2001:9), it should empirically be applied by "looking at each side separately" (Pruitt 2005:6).

By repositioning the theory toward the cost-benefit calculus of a conflict *actor*, another advantage is that it becomes possible to identify different types of costs that influence decision making. Beyond the costs directly associated with continued warfare, actors will be concerned with political costs external to the conflict. While maintaining the loyalty of supporters is important for all conflict actors, government officials experience the greatest risk of being ousted because of poor strategic decisions. Regardless of regime type, incumbents need to maintain support from key constituents to avoid being ousted in elections or by force. Thus, public opinion will be important for leaders considering whether to shift their policy from fighting to negotiating with an armed challenger (Mor 1997). Government leaders balance the risks of granting concessions, which depletes resources they can otherwise distribute to loyalists, with the possibility that the public will reward them for ending a costly and destructive conflict. As summarized by Akcinaroglu, DiCeicco, and Radziszewski (2011:263):

[1]See Zartman (2000) for many examples.

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> The mass public acts as a gatekeeper: if the public opposes engagement and rapprochement, then leaders who seek peace risk political punishment, whereas if the public favors rapprochement, then leaders who seek continued rivalry risk political punishment.

Incumbents' concern for political survival provides a mechanism that can be exploited by third parties attempting to pressure a conflict party into joining negotiations. By imposing sanctions or launching military attacks, it may be possible to increase the political costs for the incumbent of continued conflict and thereby artificially create a ripe moment for talks (Zartman 2000). Similarly, it has been argued that sudden economic shocks or natural disasters can lead to a shift in public opinion about which policy to pursue. Because natural disasters have a sudden and immediate effect, the so-called disaster diplomacy literature has identified the aftermath of disaster as particularly likely to provide a ripe moment for conflict resolution. There are three reasons why a government should become more willing to offer concessions to an armed opponent in the wake of a natural disaster: scarce resources, sympathy for the victims, and cooperation in disaster management.

Natural disasters are—by definition—sudden events that bring about extensive destruction in a country. Although the magnitude of destruction often depends on whether sufficient resources have been allocated for preventive measures, the quality of the incumbent government will be judged on the basis of its post-disaster response (Cohen and Werker 2008). Since incumbents depend on the support of the citizenry to maintain power, they have incentives to divert substantial resources for disaster relief. At the same time, government capacity may have decreased because of the preceding disaster, furthering the need to employ remaining resources effectively. One way for a government to improve its disaster management effort is to divert the resources it has currently employed against separatist challengers. Thus, governments have incentives to reconsider the use of armed force against insurgents and instead try to seek a negotiated settlement to the conflict.

Changes in public opinion are not only based on a government's ability to deliver public goods, but also on emotional responses to events. Drawing on insights from disaster sociology, Slettebak (2012) suggests that natural disasters decrease the risk of civil war by increasing social integration among victims and thereby reducing the importance of divides that otherwise may be conducive to conflict. While the theory focuses mainly on the population in the disaster zone, this unifying effect may affect the population at large as images of the victims can create feelings of empathy and disaster-related activities can demonstrate the opponent's humanity. An example of this is how the public image of rivalry between Turkey and Greece was reconsidered in the aftermath of an earthquake in Turkey 1999 (Akcinaroglu et al. 2011). Government leaders that know that

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the constituency is supporting compromise will be more willing to offer political concessions to their challengers.

There may also be more practical on-the-ground reasons for launching talks or concluding agreements in the aftermath of a disaster. An important requirement for the efficient distribution of post-disaster aid is access to the victims. In addition to government aid, international donors commonly offer additional resources to the affected region. Although the government has incentives to divert a larger proportion of available aid to its supporters, supplying post-disaster relief to civilians in a contested territory is still rational. In particular, a government—or rebel group—that is visibly trying to hinder or loot the distribution of aid will likely evoke resentment among the population. This will in turn shift loyalties for the competing group, increasing the military threat in the long term. Thus, even when there is substantial political mistrust between the parties, there will be incentives to establish temporary cooperation and cease hostilities in the immediate aftermath of the disaster.

DATA AND METHOD

This study is limited to cases where self-determination movements are active and does not extend to conflicts over the composition or ideology of a government. This delimitation was chosen for both theoretical and empirical reasons. Theoretically, it makes a difference which types of demands are made by the rebels. In government conflicts, rebels are typically demanding representation in government or a structural change of the political system. Offering these types of concessions will be less attractive for incumbents if the motivation is to remain in a position of power. Territorial conflicts differ in the sense that rebel demands focus on separatism, self-rule, or minority rights. For an incumbent, offering concessions of this type will not immediately decrease his or her position of power within the state (Buhaug 2006; Walter 2006). Furthermore, it is empirically advantageous to focus on separatist conflicts since it facilitates the geographic identification of whether the disaster affected the contested conflict area or not.

The empirical analysis is set up as follows. I compare the pre- and post-disaster likelihood that a conflict dyad starts talks, agrees to ceasefires, or concludes peace settlements, using the natural disaster event as if it were a "treatment" in a natural experiment. Thus, the dataset consists of the dyadic interaction between the government of a country and every active armed separatist challenger during the 12 months prior to a disaster event (the untreated sample) and the 12 months after the disaster (the treated sample).[2]

[2]Dyads in which the UCDP cannot confidently identify and name single organizations on the rebel side are excluded (for example, Croatian irregulars, Kashmir insurgents, Serbian irregulars, Sikh insurgents, and Patani insurgents).

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To do this, a pre-condition for my case-selections consisted of identifying rebel groups active in the 12 months prior to each natural disaster.[3] For example, when exploring the effect of the December 2004 tsunami in Indonesia, there are 12 observations prior to the disaster (Dec. 2003–Nov. 2004) and 12 following it (Jan.–Dec. 2005).[4]

One of the many challenges for empirical tests of ripeness theory is the difficulty in identifying an appropriate set of counterfactuals. Although former mediators often emphasize the importance of timing in resolving a conflict, the ripeness criteria tend to be used in a tautological manner: if a conflict was resolved, it was because the moment was ripe; if negotiations failed, it was because the moment was not ripe. In order to address this problem, this study capitalizes on a quasi-experimental design that uses a temporal cutoff to create an appropriate population. Such a design is advantageous in this case, since natural disasters are exogenous to armed conflict, as it improves the leverage of causal inference from the model.

The logic behind this research design is as follows. The risks for natural disasters are not equally distributed globally, but are confined to the limited number of countries that are exposed to natural hazards. Earthquakes and volcano eruptions, for example, occur along the edges of the tectonic plates while hydrometeorological disasters are more common in countries with an oceanic coastline (Strömberg 2007). This makes the traditional country-year approach problematic, since findings can be influenced by cross-national variation in unobserved factors that differ between countries in disaster-prone areas and elsewhere. To avoid this risk for misspecification, I employ a regression discontinuity design on a population solely drawn from disaster-prone areas. Using data on conflict dyads in countries hit by natural disasters, this paper produces quasi-experimental estimates of the effect of the natural disaster on peacemaking by comparing the prevalence of talks, ceasefires, and peace agreements immediately *before* a disaster hits to the talks, ceasefires, and peace agreements that occur immediately *after* a disaster. Under mild continuity assumptions, the population thus consists of observations that are ex ante comparable in all other ways (on average) except in their experience of a recent natural disaster.

A further advantage of disaggregating the data into monthly observations of active separatist rebel groups for the 12 months prior to and after each single disaster event, it is possible to capture situations where a government offers to initiate a conflict resolution process with one challenger but not others. This detailed level of analysis also makes it possible to explore

[3]Activity is defined as groups that reach the required threshold of 25 battle-related deaths during the 12 pre-disaster months.

[4]A common problem with this methodology relates to the relative sharpness of the division of observations around the discontinuity (Robinson, McNulty, and Krasno 2009). To address this, I code the month of the actual disaster as missing in the output presented here; alternative specifications where it is coded as part of the pre-disaster or post-disaster period provide substantially similar results.

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the effect of other variables that may increase the likelihood that natural disasters create a ripe moment for conflict resolution, including disaster location, regime type, disaster severity, and the presence of mediators. Using a disaggregated data structure thus improves variable measurement and model specification.

All information relating to the armed conflicts and resolution events is collected by the Uppsala Conflict Data Program (UCDP). Separatist intra-state armed conflicts are identified from the UCDP/PRIO Armed Conflict Dataset (v1, 2010), using the dyadic format (Gleditsch et al. 2002; Harbom, Melander, and Wallensteen 2008). Because this dataset is in year format, I use events data from UCDP GED to determine monthly activity (Melander and Sundberg 2011; see also Eck 2012).[5]

Since data collected by UCDP are the basis for much of my analysis, a brief description of these data and their collection is warranted. All UCDP data collection focus on three core aspects: extracting information from as many relevant sources as possible, strict internal quality control, and constant revisions. Because UCDP data are global in scope, the first step in the data collection process consists of reviewing reports on violent and peacemaking events globally using Reuters Newswires, BBC Monitoring, Agence France Presse, Associated Press Newswires, International Crisis Group, Human Rights Watch, and Amnesty International. For countries where violence occurs, additional sources are examined including local news sources, NGOs, and scholarly work. Even biased sources are evaluated since they can provide contextual clarity and sometimes even useful information. All coding is done by permanent staff and all coding decisions are discussed in-house. If possible, the same coder is responsible for collecting information on the same country or region during consecutive years to promote case-specific expertise and a consistent updating of relevant sources.

The downside of this approach is that source materials may vary across cases and over time. UCDP focus on minimizing the risk for false positives by consistently employing a conservative interpretation of information and by ensuring that updates are checked by senior staff before being entered into the dataset. This means that UCDP estimates should be interpreted as a baseline that can best be used for within-case comparison over time. At the same time, UCDP has also established a practice for handling the risk of false negatives, which consists of revising and annually updating all datasets to include new information. Because of this rigorous approach to the data collection effort, I have high confidence that I have accurately measured whether the conflicts were active in the 12-month periods prior to and after a natural disaster.

[5]UCDP-GED data are currently publicly available for Africa only, and I am grateful for access to UCDP internal documentation for events in other regions of the world.

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Dependent Variables

I follow the existing UCDP practice in defining my three dependent variables. For the coding of the *onset of negotiations*, I stipulate that there must have been at least 12 months without talks prior to the negotiations. Talks have to discuss either the conflict issue or conflict behavior, which means that requests for negotiation or "talks about talks" are not included. *Ceasefires* were defined as being agreed to by both parties, or if both parties imposed unilateral ceasefires simultaneously. I coded joint statements reaffirming or extending (in time or space) existing agreements as a new ceasefire. *Peace agreements* must be signed by both sides and concern the conflict issue. Data on peace agreements comes from the UCDP Peace Agreement Dataset, while data on negotiations and ceasefires come from the UCDP Conflict Encyclopedia (Harbom, Högbladh and Wallensteen 2006; UCDP 2011).

Independent Variable

To identify natural disasters in conflict countries, I use data from the Centre for Research on the Epidemiology of Disasters (CRED) at the School of Public Health of the Université Catholique de Louvain in Brussels. CRED maintains a searchable database on natural disaster events that fulfill at least one of the following criteria: (1) 10 or more people reported killed, (2) 100 or more people reportedly affected, (3) declaration of a state of emergency, or (4) call for international assistance (EM-DAT 2011).[6] From this database (v12.07), I extracted information on earthquakes (seismic activity), floods, storms, volcano eruptions, and wildfires for countries in conflict during 1990–2004.[7] I registered information on the type of disaster, the date of its occurrence, the precise geographical location of the disaster, and the number of people affected by the event. The latter is defined as people requiring immediate assistance as well as displaced and evacuated people.

Control Variables

In the absence of a strong tradition of quantitative study of the effect of disasters on conflict resolution, there are few established conventions regarding model specification. In my analysis, I control for the following basic set of potentially confounding factors. The first relates to a country's available capabilities to respond to a natural disaster. This is measured with GDP per capita

[6]While there is some disagreement about which data source is most reliable with regard to natural disasters, it has been shown that any difference in coverage decreases significantly over time. From 1990 onward, there is convergence of the events included in different databases (Guha-Sapir and Below 2002; see also Strömberg 2007). Cases when no victims estimate is given are coded as missing data.

[7]Focusing on disaster type reveals that the results relating to the onset of talks are not statistically significant if only earthquakes are included.

using purchasing power parity rates, measured in hundreds of constant international US dollars (World Bank/Teorell, Charron, Samanni, Holmberg, and Rothstein 2011). Second, I control for the number of territories in a country that harbor armed separatists challengers since a government will be more concerned with reputational costs when offering concessions to challengers if faced with multiple separatist movements (Walter 2006). This variable is a count of the number of territorial intrastate conflicts in a country in the UCDP/PRIO dataset 1946–2010. Finally, previous research indicates that the longevity of a rebellion influences a government's willingness to offer concessions (Kreutz 2010). This variable is a count of the number of months since the first use of armed force in the dyad (data from UCDP 2011).[8]

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Statistical Technique

The dependent variables are all coded as dichotomous variables indicating whether there were new talks, a ceasefire, or a peace agreement signed in a specified month. However, the observations of violence are only a small fraction of the observations of peace. King and Zeng (2001) show that in such situations, a normal logit model systematically underestimates the probability of rare events and reports biased estimates. To correct for this bias, I employ the Rare Events Logit (RElogit) procedure developed by King and Zeng (2001). I report robust standard errors, clustered on country.[9]

EMPIRICAL ANALYSIS

Before turning to a statistical analysis, a first look at descriptive data indicates the overall immediate impact of natural disasters on conflict dynamics. The left side of Figure 1 shows monthly averages of battle deaths in conflict dyads during the 12 months prior to and after a natural disaster event. No clear pattern relating to the intensity of fighting is visible, even for the subset of cases where the natural disaster specifically affects the conflict territory.[10] The right side of Figure 1, which shows the percentage of conflict dyads that engage in ongoing talks, indicates a distinctive trend that negotiation incidence increases with time. This positive trend is visible already prior to the disaster event, however, which makes it difficult to isolate the effect of a natural disaster.

[8]Alternative model specifications and full statistical output available at http://www.pcr.uu.se/about/staff/Joakim_Kreutz/

[9]Clustering on the dyad, year, or specific disaster does not substantively change the results. An alternative approach to clustering would be to use a fixed-effect model, but this is not suitable because talks, ceasefires, and peace agreements are rare events (Beck and Katz 2001).

[10]Focusing on the median value or the 95% percentile of battle deaths provide similar trend lines.

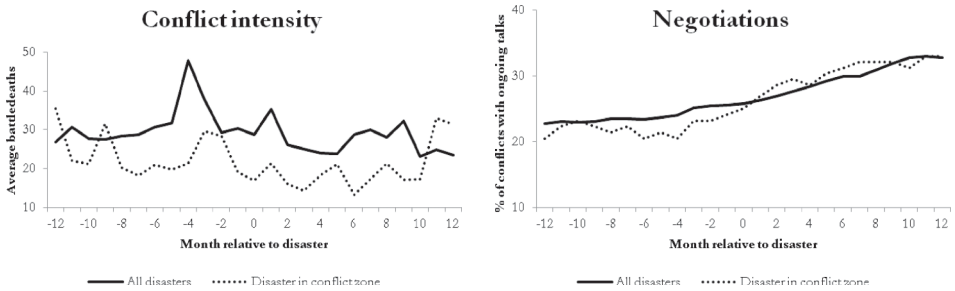

FIGURE 1 Natural disasters and conflict dynamics.

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Table 1 reports the results from a simple bivariate model (Models 1, 4, 7), adding the basic set of controls (Models 2, 5, 8), and separating disasters that occur in the conflict zone from those elsewhere in the country (Models 3, 6, 9).

The dependent variable in the first three models is the onset of negotiations.[11] The bivariate relationship is supported at the .01 level. Post-estimation analysis of Model 2 show the probability of onset of talks changes from 1.12% (95% confidence interval 0.77–1.61%) to 1.63% (1.13–2.40%) in the aftermath of a natural disaster when holding all other variables at their means. When separating disaster location (Model 3), findings indicate that there is a statistically significant effect of disasters that occur outside of the conflict zone but not those close to the fighting. This provides a first tentative sign that the causal mechanism for talks after disaster may have more to do with scarcity of government resources than a tactical decision to cooperate in relief distribution.

In the next three models (Models 4–6), the dependent variable is whether a ceasefire was concluded by the warring sides. Results for this dependent variable are statistically significant at the .01 level in a similar manner as for negotiations, but the effect is slightly more pronounced. Post-estimation analysis of Model 5 shows that the probability of a ceasefire increases from 1.23% (0.92–1.57) to 1.93% (1.53–2.41) if a country experiences a natural disaster; a change of around 57% holding all other variables at their mean. For ceasefires outside of the conflict zone the effect is even more pronounced: from 1.26% (0.99–1.65) to 2.05% (1.63–2.57) or around a 63% increase. While these probabilities may seem small at first glance, one must take into consideration that the unit of analysis is the dyadmonth for global data over a period of 15 years and that ceasefire agreements generally are rare events. As such, we should expect small absolute probabilities; what is interesting is the amount of change affected by the independent variables of interest.

[11]These models exclude observations of ongoing talks.

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TABLE 1 Natural Disasters and Conflict Resolution

DV	Model 1 Talks	Model 2 Talks	Model 3 Talks	Model 4 Ceasefire	Model 5 Ceasefire	Model 6 Ceasefire	Model 7 Peace agreement	Model 8 Peace agreement	Model 9 Peace agreement
Disaster	0.405	0.369		0.481	0.458		0.351	0.342	
	(0.107)***	(0.111)***		(0.111)***	(0.120)***		(0.305)	(0.297)	
Disaster, conflict zone			0.278			0.220			0.142
			(0.257)			(0.150)			(0.217)
Disaster, not conflict zone			0.373			0.478			0.518
			(0.010)***			(0.113)***			(0.294)*
GDP/cap		−0.004	−0.004		−0.009	−0.011		−0.011	−0.014
		(0.008)	(0.008)		(0.005)*	(0.006)*		(0.009)	(0.009)
Separatists		0.014	0.013		0.041	0.029		−0.098	−0.112
		(0.034)	(0.035)		(0.016)**	(0.016)*		(0.038)**	(0.034)***
Duration		0.002	0.002		0.002	0.001		0.001	0.001
		(0.001)	(0.001)		(0.002)	(0.002)		(0.004)	(0.004)
Constant	−4.457	−4.701	−4.665	−4.331	−4.580	−4.435	−5.996	−5.382	−5.239
	(0.165)***	(0.315)***	(0.336)***	(0.161)***	(0.301)***	(0.304)***	(0.373)***	(0.666)***	(0.737)***
Observations	12847	12807	12079	17327	17279	16271	17327	17279	16271

Note. Estimations performed using Stata 11. Robust standard errors in parentheses.
*$p < .10$; **$p < .05$; ***$p < .01$.

Models 7–9 use the signing of a peace agreement as the dependent variable. Although the coefficients are in line with the theoretical expectations, the findings are not statistically significant at commonly accepted levels. The only exception is the effect of nonconflict zone disasters which is positively correlated with the signing of a peace agreement at the .1 level.

Regime Type and Ripe Moments

While the descriptive data and the basic models presented in Table 1 show an increased probability that conflict actors initiate talks and conclude ceasefires in the aftermath of natural disasters, a closer examination is necessary to identify whether this can be explained by the proposed causal mechanism. I suggest that it is concern for public opinion that makes decision makers more willing to seek conflict resolution with intrastate armed challengers when resources are needed for disaster relief. If this is the case, then the effect should be more pronounced in democratic states than in nondemocracies. To investigate how regime type matters, I divided the data into subsets of democratic and nondemocratic countries (data from Cheibub, Gandhi, and Vreeland 2010).[12]

Figure 2 shows the substantive effects from the post-estimation analysis of the results from a re-estimation of the basic models (2, 5, 8) in Table 1, in subsets consisting of democratic respective nondemocratic states. Findings indicate that it is natural disasters in democracies that correlate with increased attempts of peacemaking. The probabilities that new talks are initiated in

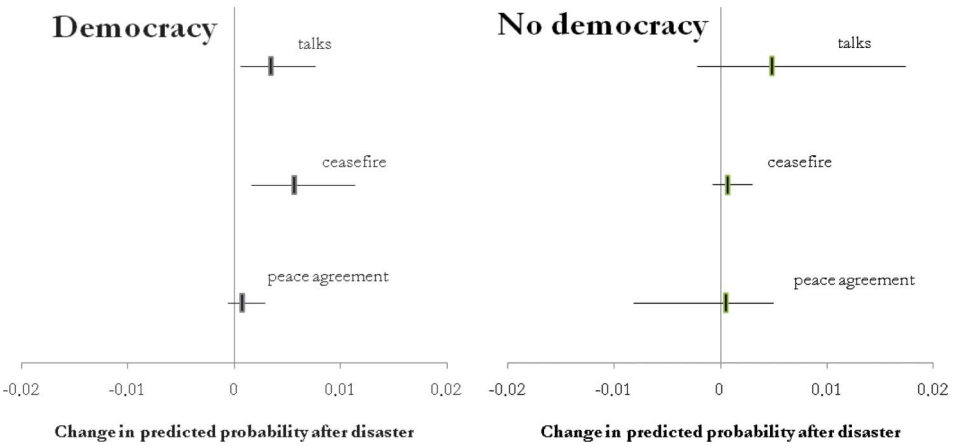

FIGURE 2 Natural disaster, regime type, and conflict resolution.

[12]The distribution in the dataset was 3,833 observations of democracy (21%) and 14,216 observations of non-democracy (79%).

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democratic states after a natural disaster increase with some 48%, and the probabilities of ceasefires increase with just over 50%. These findings provide further support for the argument that domestic political costs are considered by governments when they decide whether to enter talks or sign ceasefires with armed challengers. Furthermore, these results are in line with a theory proposed by Flores and Smith (2010) that suggests that providing disaster relief for the general public is only rational for democratic leaders, while leaders in nondemocratic states will use remaining resources after a disaster to ensure the loyalty of their key supporters. Thus, there will be little pressure in a nondemocratic state to withdraw from an ongoing war effort in the aftermath of a natural disaster.

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Disaster Severity and Ripe Moments

To explore whether disaster severity affects the probability of conflict resolution, I re-estimated the basic models (2, 5, 8) from Table 1 on subsets demarcated by every 20th percentile of the values for disaster severity.[13]

Figure 3 shows the change in predicted probability for the onset of talks, ceasefires, and peace agreements over disaster severity. Natural disasters increase the probability of onset of new talks if the disaster affected between 30,000 and 153,885 victims, or if the disaster affected more than 1,000,000 victims. This provides tentative support for the suggestion that more severe disasters create a scarcity of government resources and therefore provide an incentive for the launching of talks.

Turning to the likelihood of ceasefires, disaster severity has a clear impact. Natural disasters increase the probability of a ceasefire for all subsets over 30,000 victims (the 40th percentile). Finally, peace agreements do not become more likely after natural disasters regardless of their severity.

Mediation and Ripe Moments

An aspect of ripeness theory that is often discussed relates to the role of mediation in creating a ripe moment. My argument on how scarce government resources and increased demand for disaster relief changes government priorities suggests that the key factor is internal decision making rather than third party efforts that matters. Thus, looking at the role of mediation in the likelihood of new talks, ceasefires, and peace agreements provides a competing explanation which is also based in ripeness theory.

Mediation can take several forms which can be roughly divided into two categories. The more traditional approach focuses on measures that

[13]The 1st to 20th percentile include disasters with between 1 and 2,980 affected victims; the 21st to 40th 2,981–30,000; the 41st to 60th 30,001–53,885; the 61st to 80th 153,886–1,000,000; and the 81st to 100th 1,000,001–128,000,000.

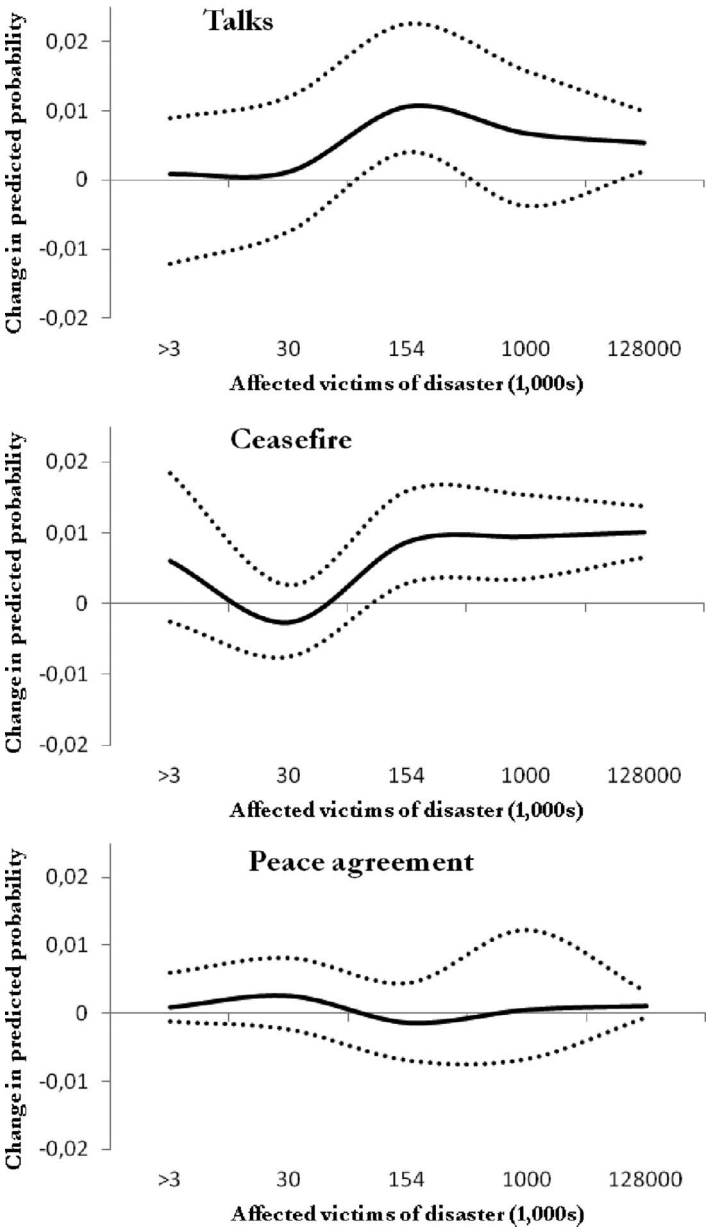

FIGURE 3 Disaster severity and conflict resolution (smoothed estimates, with 95% confidence intervals).

make it easier for warring sides to meet and where the mediator tries to advance proceedings by creating a context of understanding and possibly tabling peace proposals for belligerent to consider. I term this traditional mediation. A second type of mediation approach consists of the mediator

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TABLE 2 Natural Disasters, Mediation, and Conflict Resolution

DV	Model 1 Talks	Model 2 Talks	Model 3 Ceasefire	Model 4 Ceasefire	Model 5 Peace agreement	Model 6 Peace agreement
Disaster	0.117	0.254	0.234	0.465	0.308	0.256
	(0.209)	(0.135)*	(0.098)**	(0.082)***	(0.470)	(0.272)
Mediation, bilateral	1.125		0.614		3.030	
	(1.186)		(0.555)		(0.582)***	
Disaster*Mediation, bilateral	0.432		0.671		0.055	
	(1.057)		(0.366)*		(0.374)	
Mediation, traditional		4.353		2.232		4.754
		(1.657)***		(0.496)***		(0.298)***
Disaster*Mediation, traditional		0.900		−0.506		0.129
		(1.184)		(0.007)*		(0.284)
GDP/cap	−0.001	−0.005	−0.005	−0.006	−0.004	0.008
	(0.006)	(0.009)	(0.007)	(0.007)	(0.029)	(0.016)
Separatists	0.006	−0.019	0.030	0.036	0.013	0.037
	(0.047)	(0.047)	(0.023)	(0.027)	(0.089)	(0.064)
Duration	0.001	0.001	0.004	0.003	0.002	−0.004
	(0.004)	(0.004)	(0.001)***	(0.001)***	(0.007)	(0.007)
Constant	−4.576	−4.317	−4.774	−4.839	−7.090	−6.850
	(0.441)***	(0.471)***	(0.284)***	(0.316)***	(2.178)***	(1.259)***
Observations	8193	8565	10401	10829	10401	10829

Note. Estimations performed using Stata 11. Robust standard errors in parentheses.
*$p < .10$; **$p < .05$; ***$p < .01$.

interacting with only one of the warring sides, trying to convince them to initiate talks with their opponent. Following earlier work, I refer to this as bilateral mediation (Melander, Möller, and Öberg 2009). Both approaches can potentially influence a government's perception that the experience of a natural disaster creates a ripe moment for conflict resolution. In Table 2, I use data on mediation events from the MIC dataset (Melander and von Uexkull 2011) to explore how mediation influences the effect of natural disasters on conflict resolution.[14]

Models 1, 3, and 5 include a variable indicating that bilateral mediation with one of the parties, usually the government side, occurred in the preceding month of the observation, as well as an interaction term between the mediation and a natural disaster. Adding mediation to the model means that the positive effect on the initiation of talks is no longer statistically significant, through nor are the mediation variables in Model 1. Ceasefires continue to be more likely after natural disasters (Model 3), while Model 5 reveals that preexisting bilateral mediation increases the likelihood that a peace agreement is signed.

Looking at the more traditional type of mediation where the third party provides good offices or in other ways is actively engaged in the ongoing

[14]I use a beta version of the dataset, as coding is currently underway, thus the lower *n* for these analysis.

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talks (Models 2, 4, 6), natural disasters increase the probability of both talks and ceasefires, as before. The interaction term is only statistically significant for ceasefires but it has a negative coefficient. Overall, the presence of mediators increases the likelihood for talks and that these are formalized in the form of ceasefires and peace agreement; a conclusion that also is in accordance with existing research findings (Walter 1997). The findings in Table 2 show that mediation is beneficial for conflict resolution but that this effect is quite separate from the positive effect of natural disasters on talks and ceasefires. The relationship between the two variables does not appear to be conditional.

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DISCUSSION

Drawing on the extant literature on ripeness theory and disaster diplomacy, this paper has suggested that natural disasters can provide incentives for governments to open up negotiations, agree to ceasefires, or conclude peace agreements with armed separatist challengers. Following an empirical analysis of 405 different disasters in 21 countries, I find that there is an increased probability that talks are initiated and that ceasefires are concluded following natural disasters, but that there is no similar effect on peace agreements. As predicted by the theory, this relationship occurs particularly in democracies and following more severe disasters. While this study finds that the presence of mediators is beneficial to peacemaking, there seems to be no conditional relationship between mediation and natural disasters.

I further find that the positive effect of disasters on peacemaking primarily comes from disasters outside the immediate conflict zone rather than near the ongoing insurgency. This finding indicates that the mechanism that provides peace in post-disaster situations is not the humanitarian suffering of the disaster per se, but incumbents' concern for political survival. Governments do not engage in peace talks because disasters have created a sense of solidarity with their former enemies, but because they need to redeploy resources from the war effort toward disaster relief. Additional evidence for this mechanism is provided by the nonfinding that natural disasters do not increase the likelihood of peacemaking in autocracies, where government constituency is restricted to a smaller group of stakeholders. As argued by Flores and Smith (2010), this theory provides a logical explanation for the lack of government disaster relief to victims in Myanmar after cyclone Nargis in 2008, despite the presence of several local volunteer efforts (Seeking 2009).

Why are talks and ceasefires more likely than a peace agreement? A possible explanation relates to the nonbinding nature of talks and ceasefires. The original ripeness iteration of ripeness theory states that a costly situation

needs to be accompanied by a perceived way out to create a ripe moment (Zartman 2000). However, parties may see some "ways out" as less long-term commitments. Merely talking or ceasing armed activity can be seen as a temporary rather than a long-term strategy, and as a result conflict parties may view them as less costly tactics. A weakness of ceasefires is thus that parties have few qualms about withdrawing from the agreement and resuming armed activities. However, despite the varying success of ceasefires, a closer look at the data reveals that they are rarely used by conflict parties as a tactical impasse to rebuild military strength. The vast majority of ceasefires—from countries such as Georgia, India, Indonesia, Nigeria, Papua New Guinea, the Philippines, Russia, and Sri Lanka—were accompanied by serious peace talks addressing the conflict issues.

This study is the first systematic analysis of whether external shocks in the form of natural disasters influence conflict resolution, but it leaves several important questions unanswered. The article does not, for example, discuss rebel movement's reactions to natural disasters. Do rebel groups consider themselves responsible for distributing aid after a disaster? Do they deliberately sabotage government relief delivery as a way of underscoring the inadequacy of government administration and thereby hope to attract more recruits? Does poor government disaster management lead to new rebellions, as argued by Brancati (2007) or Homer-Dixon (1999)? Thus, the findings from this paper may suggest that natural disaster produce dual windows of opportunities: one to end ongoing conflicts, and another for new rebels to appear. This may be a fruitful path to explore for future research efforts on the natural disaster-conflict nexus.

From a policy point of view, the conclusion that natural disasters can provide a ripe moment for the initiation of a peace process is useful. In the midst of conflict, getting the parties to the table and agreeing to a ceasefire has obvious advantages in temporarily stopping the killing, and provides an opportunity to administer humanitarian aid. It does not, however, provide a long-term solution to the conflict issue and research has shown that conflicts that end with just a ceasefire are substantially more likely to resume than victories or peace agreements (Kreutz 2010). Thus, it is of the essence that the opportunity for further negotiations provided by the ceasefire is acted upon, and that skillful mediation, rather than a natural disaster event, can bring parties toward a long-term settlement.

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