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**Working Papers
in
Economics and Statistics**

**On the Channel and Type of
International Disaster Aid**

Paul A. Raschky and Manijeh Schwindt

2009-16

On the Channel and Type of International Disaster Aid

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Abstract

Research suggests that a donor country's decision to provide post-disaster assistance is not only driven by the severity of a disaster and the resulting humanitarian needs in the recipient country but also by strategic considerations. We argue that the identification of the determinants of the *size* of disaster assistance is a first step in the analysis of the donor's behavior. Since all aid is not motivated by the same reasons, the evaluation of the donor country's behavior requires a second step accounting for the *type* and the *channel* of aid provided. Using data on international disaster assistance between 2000 and 2007 one can examine both the donor countries' decision on the channel (bilateral vs. multilateral) and the type of disaster relief (cash vs. in-kind). The empirical results suggest that international disaster relief is not as much driven by the needs of the recipient country but also by strategic interests (e.g. oil, trade relationships) of the donor country. Bilateral and cash transfers are used as a vehicle to signal strategic interests, while multilateral and in-kind transfers are chosen to control for misuse in badly governed recipient countries.

Keywords: Foreign aid, natural disasters, bilateral vs. multilateral, type of aid

JEL classification: O17, O19, Q54

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1 Introduction

Research suggests that by 2015 the number of people affected by natural disasters could rise by more than 50 per cent to an average of more than 375 million each year (Bailey 2009). Such an enormous increase in the number of people facing risks of natural disasters will inevitably increase the need for humanitarian assistance. Budget constraints call for an improvement of disaster assistance strategies and a more efficient application of scarce resources. Therefore, a better understanding of the allocation of disaster relief, including the quantity and quality, is necessary. Why did the United States assist in 43% of flood relief cases in Kenya with cash transfers and only in 20% of the flood relief cases in Bolivia (despite both recipient countries having comparable numbers of fatalities from floods between 2000 and 2007)? Why did Mozambique receive 59% of United States' flood relief inflows bilaterally and the remaining via a multilateral agency, while India received only 14% of its United States' flood assistance bilaterally?

In order to shed more light on this question we combine aspects of two broad strands in the literature on foreign assistance. First, we refer to the literature on the type of aid, with discussions on the effectiveness of cash and in-kind transfers, respectively (e.g. Currie & Gahvari 2008). The argument of paternalism brought forward in this literature, can be seen as an explanation for the tendency to provide in-kind or restricted aid transfers, in particular to recipient nations with weak institutions. Recent contributions analyzing moral hazard behavior of the recipient country include Amegashie, Ouattara & Strobl (2007) and Svensson (2000).

Second, our paper relates to the vast amount of literature investigating the allocation of foreign aid. The seminal paper by Dudley & Montmarquette (1976), which argues that the supply of foreign aid will be explained by the donor countries' demand for foreign aid impact, paved the way for a discussion of donors' motives behind contributing aid. The majority of these papers showed that foreign aid allocation is determined by the donor countries' strategic and political interests rather than by the recipient countries' need. For example, Kuziemko & Werker (2006) find that more foreign aid is paid to countries which rotate on a seat in the U.N. security council, Dudley & Montmarquette (1976) show that foreign aid is induced by the level of exports from donor to recipient countries and the results of Alesina & Dollar (2000) suggest that colonial ties result in greater aid allocation. More specifically and of great relevance for this paper, Fink & Redaelli (2009) find that not only foreign aid but also international emergency assistance is determined by political and strategic interests. They show that more emergency aid is paid to countries which are located closer to the donor country, export oil or were former colonies of the donor country. In addition, the results of Eisensee & Strömberg (2007) suggest that U.S. disaster relief is driven by the level of media coverage of disasters. By contrast Olsen, Carstensen & Høyen (2003) find a rather limited role of news coverage. They use case-studies in order to show that the size of humanitarian assistance is determined by the donor country's interest in stability and security in the affected country as well as by the local presence of international organizations with lobbying power. The former argument is consistent with what Bermeo (2007) calls strategic development or strategic stabilization. According to her argument and in contrast to the above mentioned literature, all foreign aid is used for strategic interests. However, development or stabilization of the recipient country can be part of the strategic goal as well. In this case, donor interests and recipient needs coincide.

The analysis so far had a focus on the determinants of the size of aid and emergency assistance, respectively, including the implicit assumption that all donors give the same type of aid and use the same channels or that all aid is motivated by the same reasons. We argue that the analysis of the amount of aid is a necessary first step but not sufficient to derive implications about donor

countries' behavior. In order to get a more comprehensive picture on the motivation of donor countries' incentives to provide humanitarian aid and to design more efficient mechanisms of international (disaster) assistance, the decision on both the type and the channel of aid need to be considered. What criteria does a donor country use in order to decide whether to assist by cash transfers or in-kind transfers? Why do countries pay bilateral aid to one country and multilateral aid to another? Maintaining the terminology of Bermeo (2007) and distinguishing between strategic stabilization goals and non-stabilization goals, we would expect that donor countries try to maximize aid effectiveness by their choice of the type and channel of aid, if strategic stabilization is the main objective. Whereas we would expect them to choose the type of aid, which the recipient country values the highest, when their primary interests are non-stabilization goals.

Strategic stabilization requires that transfers reach their desired recipients. However, in comparison to cash transfers, restricted transfers, e.g. in-kind transfers, might be better suited for the reduction of moral hazard behavior and efficient targeting (e.g. Amegashie et al. 2007¹, Besley & Coate 1991, Gahvari & Mattos 2007, Svensson 2000). Note, that the term cash transfer does not include conditional cash transfers. Literature on conditional cash transfers suggests that depending on the design this form of assistance can be very effective. For example, Doocy, Gabriel, Collins, Robinson & Stevenson (2006) describe the implementation of cash for work programs after the Tsunami in Aceh.² Not only the type of aid, but also the channel of aid might be relevant for the ability of transfers to achieve stabilization. Opposed to bilateral assistance, multilateral agencies might have better information about the risks in aid receiving countries and hence account for them in their allocation decisions (Weck-Hannemann & Schneider 1991). Moreover, since donor countries lack commitment power, Svensson (2000) argues that the delegation of aid to agencies which are less risk averse and have plausible commitment techniques could provide incentives in the recipient country to generate own effort. On the other hand, non-stabilization goals are more probable to achieve, if the aid receiving government values the assistance highly. It is reasonable to assume that governments value cash payments higher than in-kind payments because they can use it in accordance with their own preferences. Moreover, donor countries transferring money directly to recipient governments might be more successful in building up political ties, since bilateral transfers are more visible for recipients than countries which act anonymously via a multilateral agency. For that reason, strategic stabilization goals should increase the probability of multilateral and in-kind transfers whereas non-stabilization goals should induce bilateral and cash transfers.³

The remainder of the paper is organized as follows: In section 2 we present the theory and derive the signs for the partial derivatives of the probability of the different types of aid. Research design, data and econometric strategy are presented in section 3. Finally, section 4 concludes.

¹In fact, Amegashie et al. (2007) investigate how donor countries' choice of the composition of cash and in-kind transfers adjusts to changes of the moral hazard behavior of recipient countries. While multilateral donors reward (penalize) decreases (increases) in moral hazard behavior by reducing (rising) the proportion of in-kind relative to cash-transfers, bilateral donors do not react to changes in moral hazard behavior.

²For a more detailed analysis of aid programs using conditional cash transfers see Fiszbein, Schady, Ferreira, Kelleher, Olinto & Skofias (2009).

³Needless to say that the decision on the type and channel of post-disaster assistance is determined by other characteristics (e.g. disaster type) as well. Of course we control for these variables in the empirical part of this paper.

2 Theory

In order to derive the factors which explain the choice of the type and channel of disaster aid made by donor countries, we use a technical framework applied by Huber & Nowotny (2008). They analyze an individuals decision to commute and to migrate in another region opposed to the possibility to stay in the home region.

First, we allow each donor country to choose between bilateral disaster assistance, multilateral disaster assistance and no disaster assistance. The donor country's decision to assist or not and its choice between bilateral and multilateral disaster aid are based on two instruments, which according to Bermeo (2007), both contribute to foreign policy purposes. First, because of strategic reasons, the donor country might be interested in the stabilization of the recipient country in the aftermath of a disaster. Strategic stabilization could, for example, be motivated by the intention to mitigate negative spill-over effects on the donor country's economy or to prevent large flows of disaster-refugees. Hence, under these circumstances donor interests and recipient needs coincide. Second, the donor country might have other strategic interests not related to the strategic stabilization goal, which the donor country wants to promote, e.g. political ties to oil exporting countries.

To be more precise, consider a donor country with GDP Y_D which decides a) whether to contribute an amount of T to a country which was hit by a natural disaster and b) whether to transfer this amount directly to the recipient government (bilateral (B)) or via a multilateral agency (M). Empirical results suggest that it is reasonable to assume that disaster assistance contributes to a higher level of stabilization in the recipient country S_R^h , $\forall h = B, M$ and hence a higher utility level of the donating country if e.g. good governance indicators in the recipient country are high (Burnside & Dollar 2000). Therefore, the stabilization effect is determined by the ability of multilateral and bilateral disaster aid to circumvent the adverse effects of bad governance, respectively. Due to a more profound knowledge of the specifics of the recipient countries resulting from the presence in affected countries, we assume that the control mechanism using multilateral disaster assistance is better compared to the control in the case of bilateral disaster assistance. Moreover, Svensson (2000) suggests that the delegation of aid to international agencies with fully developed commitment technologies contributes to a higher efficiency level. For this reason, stabilization is easier to enforce with multilateral assistance for a given level of good governance. Moreover, for higher levels of good governance, strict control mechanisms are less of a constraint. In order to gain utility from better access to strategic interests I_R^h , $\forall h = B, M$ in the recipient country, it is important for the donor country to ensure that the source of disaster assistance is visible for the recipient country. We assume that bilateral disaster assistance is more visible than multilateral disaster assistance and thus secures strategic interest in a better way. Assuming an additive utility function, the utility U_B of a donor country choosing bilateral disaster assistance is determined by its own governmental purchases $Y_D - T$, by the stabilization effect in the recipient country S_R^B and by the strategic advantages I_R^B induced by bilateral disaster aid. We formulate the donor country's utility function for bilateral emergency assistance as

$$U_B = Y_D - T + S_R^B + I_R^B + \epsilon_B. \quad (1)$$

Equivalent to equation (1) the donor country's utility in the case of multilateral disaster assistance is

$$U_M = Y_D - T + S_R^M + I_R^M + \varepsilon_M. \quad (2)$$

The terms ε_B and ε_M are random utility components for donating bilateral and multilateral, respectively. Apart from bilateral and multilateral disaster assistance, the potential donor country can decide not to assist. In this case the donor country's utility is

$$U_N = Y_D + \varepsilon_N. \quad (3)$$

We use equations (1), (2) and (3) in order to calculate the utility differentials between bilateral disaster assistance (U_B), multilateral disaster assistance (U_M) and no disaster assistance (U_N).

$$U_B - U_N = -T + S_R^B + I_R^B + \varepsilon_B - \varepsilon_N \quad (4)$$

$$U_M - U_N = -T + S_R^M + I_R^M + \varepsilon_M - \varepsilon_N \quad (5)$$

Equations (4) and (5) state that higher levels of stabilization S_R^h achieved with bilateral and multilateral disaster aid as well as higher strategic gains, increase the utility of disaster assistance in comparison to not assisting. However, assistance bears costs in the form of a reduction in a donor country's government purchases.

$$U_M - U_B = (S_R^M - S_R^B) + (I_R^M - I_R^B) + \varepsilon_M - \varepsilon_B \quad (6)$$

Equation (6) shows that the stabilization differential ($S_R^M - S_R^B > 0$) increases the utility gain from multilateral disaster assistance, whereas the strategy differential ($I_R^M - I_R^B < 0$) increases the utility gain from bilateral disaster assistance.

In order to simplify (4), (5) and (6) we define the direct utility gains by

$$\Omega_{BN} = -T + S_R^B + I_R^B \quad (7)$$

$$\Omega_{MN} = -T + S_R^M + I_R^M \quad (8)$$

$$\Omega_{MB} = (S_R^M - S_R^B) + (I_R^M - I_R^B) \quad (9)$$

and rewrite (4), (5) and (6) as

$$U_B - U_N = \Omega_{BN} + \xi_B, \quad (10)$$

with $\xi_B = \varepsilon_B - \varepsilon_N$.

$$U_M - U_N = \Omega_{MN} + \xi_M, \quad (11)$$

with $\xi_M = \varepsilon_M - \varepsilon_N$.

$$U_M - U_B = \Omega_{MB} + (\xi_M - \xi_B) \quad (12)$$

Equations (10) - (12) state that countries will decide not to assist, if $\xi_B < -\Omega_{BN}$ and $\xi_M < -\Omega_{MN}$. However, for $\xi_B > -\Omega_{BN}$ and $\xi_M > -\Omega_{MN}$ there will be bilateral or multilateral disaster assistance, depending on the relation of Ω_{BN} and Ω_{MN} . Countries will choose bilateral disaster assistance for $\xi_B > -\Omega_{BN}$ and $(\xi_M - \xi_B) < -\Omega_{MB}$, whereas they will assist via a multilateral agency if $\xi_M > -\Omega_{MN}$ and $(\xi_M - \xi_B) > -\Omega_{MB}$.

We can now determine the probability that a donor country chooses bilateral assistance (P_B), multilateral assistance (P_M) and no assistance (P_N).

$$P_B = Pr(\Omega_{BN} > -\xi_B; \Omega_{MB} < -(\xi_M - \xi_B)) \quad (13)$$

$$P_M = Pr(\Omega_{MN} > -\xi_M; \Omega_{MB} > -(\xi_M - \xi_B)) \quad (14)$$

$$P_N = Pr(\Omega_{BN} < -\xi_B; \Omega_{MN} < -\xi_M) \quad (15)$$

Using comparative statics we can derive the derivatives of probabilities of assisting by bilateral or multilateral transfers and not assisting (see table 1).

Table 1: The choice between bilateral, multilateral and no disaster assistance subject to selected variables

	T	S_R^B	S_R^M	I_R^B	I_R^M
P_B	-	+	-	+	-
P_M	-	-	+	-	+
P_N	+	-	-	-	-

Now that we have determined the partial derivatives of the probabilities to pay bilateral disaster assistance, multilateral disaster assistance and no assistance, we vary the options of the donor country, by distinguishing between cash (C) and in-kind (IK) transfers in the case of bilateral assistance. In accordance to (1) - (3), we formulate the donor country's utility depending on the type of aid, as:

$$U_{IK} = Y_D - T + S_R^{IK} + I_R^{IK} - C + \varepsilon_{IK} \quad (16)$$

$$U_C = Y_D - T + S_R^C + I_R^C + \varepsilon_C \quad (17)$$

$$U_M = Y_D - T + S_R^M + I_R^M + \varepsilon_M \quad (18)$$

$$U_N = Y_D + \varepsilon_N \quad (19)$$

Note that in-kind transfers are assumed to cause some additional transportation costs (C), which will be higher for large distances between donor and recipient country. Moreover, we would expect that in-kind transfers can better control for the adverse effects of bad governance compared to cash transfers, whereas cash transfers might be valued higher than in-kind transfers from the aid receiving country and hence be more suited for achieving strategic goals. Using the same approach as above, we determine the following signs of the partial derivatives of the probabilities to choose cash, in-kind, multilateral or not any assistance (see table 2).

Table 2: The choice between cash, in-kind, multilateral and no disaster assistance subject to selected variables

	T	S_R^{IK}	S_R^C	S_R^M	I_R^{IK}	I_R^C	I_R^M	C
P_{IK}	-	+	-	-	+	-	-	-
P_C	-	-	+	-	-	+	-	+
P_M	-	-	-	+	-	-	+	+
P_N	+	-	-	-	-	-	-	+

3 Empirical analysis

3.1 Research design and data

We are interested in the decision of potential donor countries (i.e. every country that has not been directly affected by a disaster) to provide post-disaster assistance and the channel and type the actual donors choose. In order to examine the effect of humanitarian needs of a recipient country and strategic interests of a donor country, we construct a basic dyadic data set for each major natural disaster (that is included in the EM-DAT data set) in a given country between 2000 and 2007. For any given disaster in a country, all remaining countries are considered as potential donor nations. Including only those cases where one potential donor actually provided aid in our regression would truncate the data. All potential donors that did not provide post-disaster assistance are coded zero and this information is used in the first stage selection estimates. The combination of 228 disasters, where information on both the channel and type of disaster aid is available, and 187 potential donor nations, results in a basic dataset of 42,636 observations. However, this number is reduced to between 20,077 and 25,836 (depending on the specification)

due to missing data. Of the aforementioned observations, between 2,603 and 3,123 (depending on the specification) observations are actual aid contribution (dependent variable=1).

The dependent variables are dummies that switch to 1 if a donor has contributed post-disaster assistance (in the selection equation), switch to 1 if the contribution was bilateral (in the channel equation) or switch to 1 if the type of contribution was cash (in the type equation). In figures 1 and 2 we show the breakdown of total aid in bilateral vs. multilateral and cash vs. in-kind by major recipients. Pakistan received 602 contributions. Among these 602 contributions, 463 (77%) were made via a multilateral agency and 139 (23%) were made bilaterally. Peru on the other end of the list, received 99 contributions where 54 (55%) were made multilaterally and 45 (45%) bilaterally. The differences between recipient countries in the type of disaster aid received is even bigger. Out of 100 contributions to Haiti only 1 (1%) was bilateral cash, while Mozambique received 53 (16%) bilateral aid contributions out of 335 disaster assistance flows. The main explanatory variables include indicators for humanitarian needs by the recipient and variables accounting for strategic interests of the donor. The former group includes the number of fatalities in a disaster (in thousand) and the level of gross domestic product per capita (GDP p.c.). The latter group contains information on the donor's trade volume with the recipient and the percentage of fuel exports of total merchandise exports by the recipient. These two variables are widely used as empirical proxies for strategic interests in the existing aid allocation literature (e.g. Fink & Redaelli 2009, Berthelemy 2004). In addition we include dummies for the type of natural disaster.

In choosing other relevant covariates, we follow the existing empirical literature (e.g. Fink & Redaelli 2009, Alesina & Dollar 2000): Size of the recipient country (population), distance between donor and recipient, oneness for trade, colonial history between the donor and the recipient as well as an updated version of Gartzke's affinity index that is constructed using voting patterns in the United Nations General Assembly. The index ranges between 1 (recipient and donor always voted the same way) and -1 (recipient and donor never voted the same way). In addition we include two dummy variables that account for common religious beliefs and common language in the donor and recipient countries. The donor nation's level of development measured via the GDP p.c. is also included. Table 15 gives an overview of the data sources used.

3.2 Econometric Strategy

Based on the theoretical concept in section 2, our goal is to identify the driving factors of the likelihood of choosing 1) a certain channel for disaster aid (bilateral vs. multilateral) and 2) a certain type of disaster aid (cash vs. in-kind). The decision on both the channel and the type however, is conditional on the decision to provide post-disaster assistance at all. The resulting selection problem can be formulated as follows:

$$Pr(y_2 | x) = Pr(y_2 | x, y_1 = 1)Pr(y_1 = 1 | x) + Pr(y_2 | x, y_1 = 0)Pr(y_1 = 0), \quad (20)$$

where y_1 denotes the selection variable and equals 1 if aid is given, zero otherwise, y_2 denotes the second stage channel (1 if aid is bilateral, zero if multilateral) or type (1 if type of aid was cash, zero if in-kind) and x is a vector of covariates. In our case, the sample selection model consists of two stages: The first stage defines the cases where actual post-disaster aid is given. The selection variable is a latent variable y_1^* and equals 1 if aid is given. The second stage is the outcome stage and is estimated in two separate specifications. In the first specification it describes the cases where bilateral aid was given, while in the second specification it describes the cases when cash was contributed rather than in-kind. In either of the two specifications we

denote this second stage latent variable as y_2^* . We derive the following system:

$$y_1^* = x_1\beta_1 + u_1 \quad (21)$$

$$y_2^* = x_2\beta_2 + u_2 \quad (22)$$

x_i and u_i are the explanatory variables and the error terms for the first and the second stage. The correlation between the two equations, ρ , indicates if there is actual sample selection. The traditional Heckman model (Heckman 1979) requires that the second stage outcome equation is estimated using OLS. Dubin & Rivers (1989) developed an extended selection model where second stage is estimated using a probit model, which is applied in this paper. The latent variables y^* are related to the observed variables y in the following way:

$$y_2 = \begin{cases} 1 & \text{if } y_2^* > 0 \text{ and } y_1^* > 0 \\ 0 & \text{if } y_2^* < 0 \text{ and } y_1^* > 0 \end{cases} \quad (23)$$

The application of a sample selection model requires unique information in the explanatory variables x_1 and x_2 to separately identify the parameters in the selection and the outcome stage. To deal with this issue we use the donor nation's population as additional selection variable in the first stage selection.

3.3 Results

The results are structured by the strategic variables of interest, oil and trade. We start presenting estimates of the second stage estimates on the decision on the channel of disaster aid including the fraction of fuel exports of total merchandise export if a contribution has been made (Table 5). The dependent variable is a dummy that equals to 1 if the contribution was bilateral and 0 if it was multilateral. Fatalities do not appear to have an impact on the choice of the aid channel, but the number of people affected has a significant positive impact. More distant countries are also more likely to receive aid via a multilateral agency. Countries with a higher fraction of fuel exports and better governance indicators are more likely to receive bilateral aid. These results allow for interpretations: First, the bilateral channel is preferred over the multilateral channel because it is more attributable to the donor and thus supports strategic interests in a better way. Second, donors are more likely to give aid via a multilateral agency because these agencies might have a better competence in controlling the sound use of the aid in recipient nation's with low good governance indicators.

The interaction term of oil and good governance indicators have a negative sign and are only significant at the 5%-level for corruption control (column (5)). The signalling effect of bilateral aid might be decreasing with better regulatory quality or corruption control.

Table 6 presents the results of the first stage selection equation. As expected, countries that have suffered more fatalities and where more people were affected from a disaster and that are poorer are more likely to receive international disaster assistance. In line with the standard ODA literature, donors appear to favor more open recipient countries. Interestingly, smaller nations are less likely to receive disaster aid. This result stays in contrast to the small-country bias found in

ODA decisions. The likelihood of receiving aid increases in the number of fatalities and if donor and recipient country have a common language. In accordance with the findings of Fink & Redaelli (2009) and opposed to the existing literature on ODA decision, affinity does not increase the likelihood of receiving aid from a donor. Interestingly, if the donor and the recipient share the same religious beliefs, the likelihood of receiving aid significantly decreases. One possible explanation for this result is that the data on religion only controls for potential frictions between large religious groups and not within the large religious groups (e.g. Sunnite and Shiite).

In the specification presented in column (2) we have included oil (percentage of fuel exports from total merchandise exports) as an additional regressor. A higher fraction of fuel exports increases the likelihood of receiving disaster aid. These results remain robust after the inclusion of regulatory quality (column (3)) and corruption control (column (5)). Including the oil variable with the good governance indicators (columns (4) and (6)) reveals that the likelihood of receiving aid decreases for a recipient nation that has large fuel exports and good regulatory quality and increases if the recipient has large fuel exports and good corruption control.

We now turn to the estimates of the specifications using trade volume as the second indicator for strategic interests. The results of the aid selection equations in table 8 are pretty similar to the first stage results for the oil estimates in table 6. The effects of strategic interests and good governance as well as the interaction of these two variables reveal a similar trend for the trade estimates. Donors are more likely to donate via a multilateral agency if there has been a major disaster causing a large number of fatalities and if the affected country is poor. In contrast to the oil estimates, there are differences in the second stage estimates on the channel of aid. The interaction between trade volume and governance indicators is positive and highly significant.

The next step consisted of changing the specification of the second stage estimates and examining the decision on the type of aid. The dependent variable is the probability of giving bilateral cash. We only present the results of the second stage for both the oil and trade estimates. Interestingly, fuel exports do not appear to have a significant effect on the likelihood of receiving cash (table 9), while trade volume has a significantly positive effect throughout all specifications (table 10). Humanitarian aspects appear to have adverse effects on the likelihood of receiving cash. Donors prefer to donate cash to richer nations and after smaller disasters with fewer people killed. Regarding the strategic variables we find similar patterns as in the choice of the aid channel.

The analysis so far has assumed that the variables that explain the choice on the composition of aid do not differ between countries. The empirical literature, however, suggests that donors' decision on ODA (e.g. Alesina & Dollar 2000, Kuziemko & Werker 2006) and disaster aid (e.g. Fink & Redaelli 2009) are not the same across donor nations. For expositional convenience, we limit our analysis to a comparison between OECD and non-OECD countries. This robustness test basically splits the sample in OECD and non-OECD donor subsamples and repeats the estimates in tables 5 - 10 for each subsample, respectively.⁴ Unfortunately, the the estimates did not converge using a heckman probit estimator. We therefore applied a simple conditional probit model, estimating the likelihoods of receiving bilateral aid or bilateral cash conditional that aid has been given. Table 11 presents the coefficients of the second conditional probit models for both OECD and non-OECD donors decisions on the channel of disaster aid. A first glance reveals that the pooled estimates in tables 5 - 10 are mainly driven by the OECD sample. OECD donors are more likely to provide bilateral disaster aid if the recipient export share of fuel is large and if the recipient nation has good governance indicators. There is a smaller probability of giving

⁴We only present the coefficients of the second stage estimates for the key variables. The results of the first stage estimates as well as the full estimation table including all other covariates are available from the authors.

bilateral aid if the disaster caused a lot of fatalities and if the recipient has a larger per capita income. In contrast, fuel exports appear to have a negative and not significant impact on the decision on the channel of disaster aid for non-OECD countries. One possible explanation is that the majority of donors in this subsample are countries from the Middle East and North Africa (MENA) which are already endowed with large oil resources. Good governance indicators also influence the decision in both subsamples, where the coefficients for the non-OECD countries is actually larger. Table 12 reports the result for the second strategic variable, trade. Again the results of the OECD donor group are comparable to the results of the main sample. The estimates for non-OECD again reveal that strategic interests do not play a significant role in their decision. We find some indication that the trade relationship between the donor and the recipient has a positive and significant influence on the decision to provide bilateral aid. Tables 13 and 14 show the results for the probit estimates on the type of aid for each subsample and each strategic variable, respectively. Again, the decision on the type of aid is driven by strategic interests in the case of OECD countries, while strategic interests have no significant influence on non-OECD countries decision. However, the only explanatory variables that have a significant influence in the non-OECD subsample are the disaster type dummies and the common language dummy.

4 Conclusion

Research of the past 30 years suggests that foreign aid is allocated due to strategic and political interests rather than due to recipient needs. The aim of this paper was to show that strategic concerns not only dominate the choice of the size of aid, but also the decision on the type and the channel of aid. Our theoretical results suggest that donor countries assist by multilateral or in-kind transfers rather than by bilateral or cash transfers, if their main interest is the stabilization of the recipient country, whereas they choose bilateral or cash transfers if they account for non-stabilization goals. The empirical application shows that a) recipient countries with good governance are rewarded by bilateral or cash transfers, b) countries with lower levels of GDP p.c. or higher death tolls are more probable to receive multilateral or in-kind transfers and c) the probability of getting bilateral or cash assistance increases if the donor country has strategic interests (e.g. oil or trade) in the receiving country. Moreover, we find that good governance is less of a constraint for bilateral or cash transfers if the donor country has strategic interests in the same country. We show that donor countries deliberately choose the type and channel of aid in conformity with their goals, however, strategic interests seem to dominate stabilization goals. Interestingly, the reasons to provide bilateral aid as well as cash aid differ between OECD countries and non-OECD countries. OECD countries are more likely to give bilateral aid and cash if the recipient has oil resources, is a trading partner and has sound institutions. In contrast, non-OECD countries decision on the channel and type are not influenced by strategic interests. These countries are more likely to provide bilateral aid and cash if the recipient has suffered a large number of casualties in a disaster.

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Table 3: List of recipient countries' total fatalities and number of disasters

Recipient	Fatalities	Disasters	Recipient	Fatalities	Disasters
Afghanistan	669	6	Lao, PDR	15	1
Albania	1	1	Madagascar	602	5
Algeria	971	4	Malawi	567	3
Argentina	23	1	Malaysia	80	1
Armenia	n.a.	1	Maldives	102	2
Azerbaijan	31	1	Mali	2	2
Bahamas, The	1	1	Mauritania	1	1
Bangladesh	2,309	4	Mexico	84	3
Belize	44	3	Micronesia, Fed. Sts.	48	3
Bolivia	271	6	Moldova	-	1
Botswana	3	1	Mongolia	23	2
Brazil	50	1	Morocco	708	2
Bulgaria	17	1	Mozambique	908	3
Cambodia	403	2	Myanmar	307	2
Central African Rep.	1	1	Namibia	2	1
Chile	40	3	Nepal	657	2
China	1,185	4	Nicaragua	33	4
Colombia	109	2	Niger	4	2
Comoros	1	3	Oman	76	1
Costa Rica	24	4	Pakistan	74,137	7
Cuba	22	4	Panama	11	1
Czech Republic	18	1	Papua New Guinea	n.a.	1
Djibouti	51	2	Peru	815	5
Dominica	2	1	Philippines	3,070	5
Dominican Republic	830	3	Poland	27	1
Ecuador	21	4	Portugal	14	1
El Salvador	863	3	Romania	33	2
Ethiopia	498	1	Russian Federation	101	2
Fiji	17	1	Senegal	28	1
Georgia	6	3	Seychelles	3	1
Ghana	72	3	Solomon Islands	52	2
Grenada	39	1	Somalia	350	2
Guatemala	n.a.	1	Sri Lanka	35,634	3
Guinea	n.a.	1	St. Lucia	1	1
Guyana	34	1	Sudan	85	3
Haiti	2,857	4	Suriname	3	1
Honduras	21	2	Tajikistan	27	4
Hungary	1	2	Thailand	8,449	2
India	38,730	7	Togo	41	1
Indonesia	172,214	10	Tonga	n.a.	1
Iran	28,110	5	Turkey	219	2
Jamaica	29	4	Uganda	18	1
Japan	40	1	Ukraine	9	1
Kenya	173	3	Uruguay	9	2
Korea, DPR	934	3	Vanuatu	3	3
Korea, Republic of	210	2	Venezuela	80	2
Kyrgyzstan	38	2	Vietnam	844	3
			Zimbabwe	70	1

Table 4: List of donor countries' total contributions and number of donations

Donor	Total contribution (in USD)	Events	Donor	Total contribution (in USD)	Events
Afghanistan	500,000	2	Iceland	473,627	13
Algeria	2,489,199	5	India	23,630,944	10
Andorra	58,386	2	Indonesia	n.a.	1
Angola	n.a.	1	Iran	347,380	3
Argentina	n.a.	8	Ireland	40,573,378	131
Armenia	n.a.	2	Israel	2,357,000	17
Australia	54,936,086	115	Italy	76,690,358	121
Austria	11,436,846	40	Japan	445,981,017	195
Azerbaijan	622,000	4	Jordan	n.a.	3
Bahrain	n.a.	1	Kazakhstan	n.a.	2
Bangladesh	100,000	2	Kenya	75,000	1
Belarus	113,018	1	Korea, DPR	130,000	5
Belgium	44,886,419	79	Korea, Republic of	1,576,709	22
Bolivia	n.a.	1	Kuwait	3,366,013	12
Botswana	482,000	3	Kyrgyzstan	27,093,596	2
Brazil	200,000	13	Lao, PDR	75,000	3
Bulgaria	103,717	2	Latvia	446,726	6
Burundi	20,000	1	Lebanon	n.a.	1
Canada	108,799,910	204	Lesotho	110,000	2
Chile	30,000	7	Libya	1,500,000	6
China	14,009,631	56	Liechtenstein	305,278	7
Colombia	100,000	5	Lithuania	252,631	5
Costa Rica	n.a.	1	Luxembourg	12,165,218	46
Croatia	n.a.	2	Malawi	100,000	2
Cuba	129,965	7	Malaysia	5,138,948	18
Cyprus	756,462	17	Malta	10,854,817	1
Czech Republic	5,498,495	20	Mauritania	200,336	3
Denmark	60,283,135	146	Mauritius	80,000	3
Dominican Republic	196,370	3	Mexico	4,127,922	8
Ecuador	13,237	4	Moldova	455,307	5
Egypt	300,000	3	Monaco	640,081	16
El Salvador	n.a.	1	Morocco	496,980	9
Eritrea	n.a.	1	Namibia	800,000	1
Estonia	577,084	9	Nepal	235,391	4
Fiji	9,700	1	Netherlands	101,964,604	139
Finland	25,055,726	56	New Zealand	15,536,259	50
France	48,601,080	118	Nicaragua	n.a.	1
Gabon	200,000	1	Nigeria	1,150,000	3
Germany	174,339,341	371	Norway	117,858,752	223
Ghana	100,000	1	Oman	100,000	3
Greece	27,047,570	51	Pakistan	157,560	3
Guatemala	n.a.	2	Palau	51,772	2
Guyana	20,000	1	Panama	n.a.	2
Honduras	n.a.	1	Peru	111,130	8
Hungary	1,005,267	19	Poland	6,966,713	25

Table 4: List of donor countries' total contributions and
Number of donations (cont.)

Donor	Total contribution (in USD)	Events
Portugal	10,127,312	30
Qatar	22,350,468	13
Romania	2,639,255	8
Russian Federation	6,615,748	27
Rwanda	10,000	2
San Marino	19,807	1
Saudi Arabia (Kingdom of)	83,804,806	63
Seychelles	n.a.	1
Singapore	4,850,500	23
Slovakia	2,705,516	21
Slovenia	709,334	17
South Africa	3,852,500	10
Spain	73,199,347	78
Sri Lanka	n.a.	1
Sudan	10,000	1
Swaziland	15,000	1
Sweden	107,626,853	210
Switzerland	19,264,147	113
Syrian Arab Republic	n.a.	5
Tajikistan	n.a.	1
Thailand	1,085,202	13
Trinidad and Tobago	2,625,000	5
Tunisia	n.a.	3
Turkey	40,724,138	58
Ukraine	n.a.	2
United Arab Emirates	34,668,256	35
United Kingdom	306,310,134	343
United States of America	460,435,164	495
Venezuela	1,800,000	11
Vietnam	n.a.	1
Zambia	20,000	3

Figure 1: Distribution of bilateral and multilateral disaster aid - Major recipients

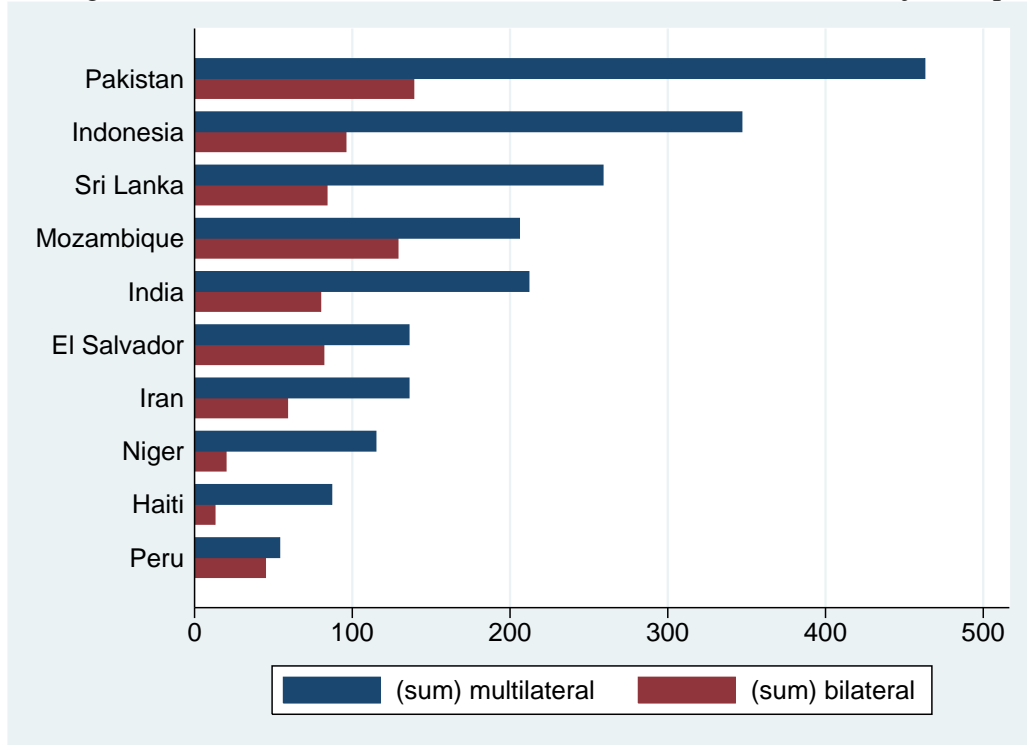


Figure 2: Distribution of cash and in-kind disaster aid - Major recipients

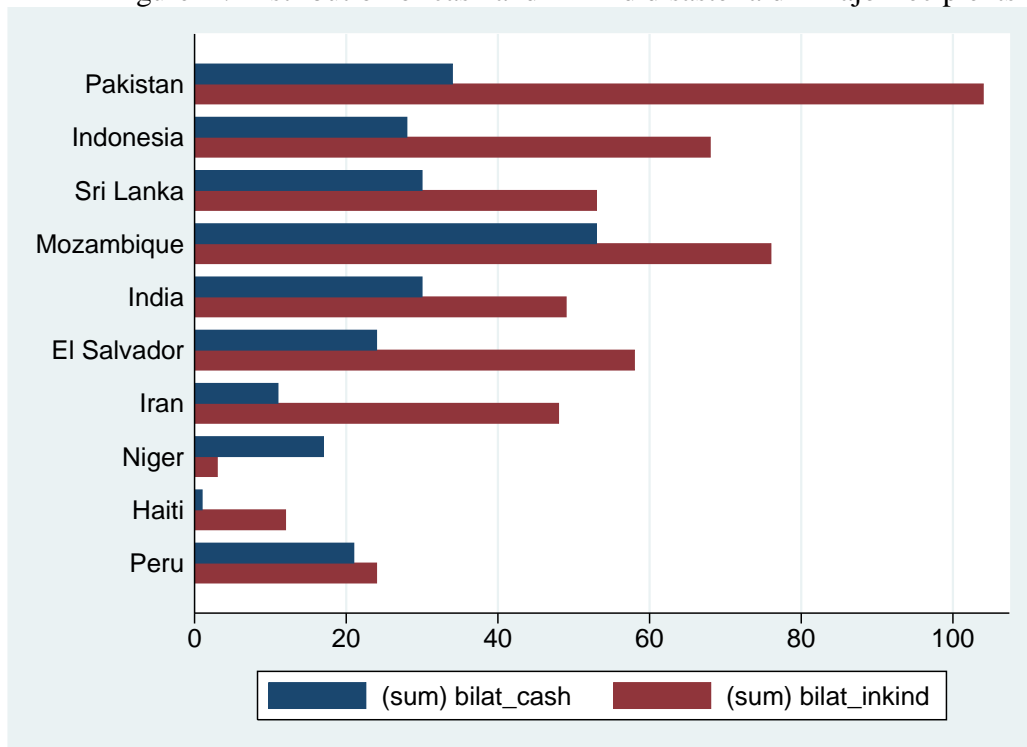


Table 5: Aid & bilateral OIL – 2nd stage

$Pr(bilateral = 1 X)$	(1)	(2)	(3)	(4)	(5)
$Ln(Fatalities)$	0.008 (0.016)	0.026 (0.017)	0.024 (0.018)	0.019 (0.017)	0.019 (0.016)
$Ln(Affected)$	0.032*** (0.005)	0.024*** (0.006)	0.023*** (0.007)	0.010 (0.007)	0.014** (0.007)
$Ln(GDP\ p.c.)$	-0.053 (0.042)	-0.119** (0.048)	-0.125** (0.060)	-0.138*** (0.054)	-0.122** (0.055)
$Ln(Population)$	-0.103*** (0.026)	-0.100*** (0.027)	-0.100*** (0.027)	-0.096*** (0.028)	-0.099*** (0.028)
$Trade\ (\% \text{ of } GDP)$	-0.001 (0.001)	-0.002 (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.000 (0.001)
$Distance$	-0.070*** (0.009)	-0.082*** (0.010)	-0.082*** (0.010)	-0.082*** (0.010)	-0.079*** (0.010)
$Affinity\ index$	0.679** (0.296)	0.470 (0.317)	0.467 (0.318)	0.546* (0.319)	0.563* (0.319)
$Common\ religion$	-0.028 (0.073)	0.003 (0.084)	0.002 (0.085)	-0.045 (0.084)	-0.048 (0.084)
$Common\ language$	0.137 (0.088)	-0.067 (0.124)	-0.067 (0.124)	-0.019 (0.122)	-0.023 (0.129)
$Former\ colony$	-0.091 (0.090)	-0.166* (0.099)	-0.166* (0.099)	-0.151 (0.100)	-0.177* (0.100)
$Ln(GDP\ p.c.)_{donor}$	-0.188*** (0.052)	-0.149*** (0.051)	-0.152*** (0.051)	-0.162*** (0.051)	-0.161*** (0.050)
$Fuel\ exports\ (\% \text{ of } merchandise\ exports)$	0.002** (0.001)	0.009*** (0.001)	0.008*** (0.003)	0.006*** (0.001)	-0.003 (0.004)
$Regulatory\ quality$		0.504*** (0.091)	0.522*** (0.122)		
$Fuel\ exports \times$ $Regulatory\ quality$			-0.001 (0.004)		
$Corruption\ control$				0.387*** (0.104)	0.477*** (0.110)
$Fuel\ exports \times$ $Corruption\ control$					-0.014** (0.006)
Disaster dummies	Yes	Yes	Yes	Yes	Yes
ρ	0.717*** (0.120)	0.793*** (0.123)	0.788*** (0.123)	0.773*** (0.121)	0.776*** (0.119)
Constant	1.308 (0.800)	1.731** (0.843)	1.813* (0.943)	2.197** (0.909)	2.077** (0.896)
Loglikelihood	-7258.304	-6054.057	-6053.534	-6056.025	6032.289
N	3158	2632	2632	2632	2632

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is bilateral, a dummy that switches to 1 if the aid flow was bilateral. ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 6: Aid & Bilateral OIL- 1st stage

$Pr(aid = 1 Z)$	(1)	(2)	(3)	(4)	(5)
<i>Ln(Fatalities)</i>	0.158*** (0.008)	0.154*** (0.009)	0.155*** (0.009)	0.153*** (0.009)	0.149*** (0.009)
<i>Ln(Affected)</i>	0.064*** (0.003)	0.056*** (0.004)	0.058*** (0.004)	0.059*** (0.004)	0.055*** (0.004)
<i>Ln(GDP p.c.)</i>	-0.094*** (0.017)	-0.141*** (0.023)	-0.130*** (0.025)	-0.084*** (0.024)	-0.094*** (0.024)
<i>Ln(Population)</i>	-0.304*** (0.013)	-0.283*** (0.015)	-0.284*** (0.015)	-0.287*** (0.015)	-0.289*** (0.015)
<i>Trade (% of GDP)</i>	-0.004*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.004*** (0.001)
<i>Distance</i>	-0.070*** (0.004)	-0.072*** (0.004)	-0.073*** (0.004)	-0.072*** (0.004)	-0.072*** (0.004)
<i>Affinity index</i>	-0.627*** (0.093)	-0.601*** (0.102)	-0.601*** (0.102)	-0.599*** (0.102)	-0.588*** (0.102)
<i>Common religion</i>	0.115*** (0.036)	0.081** (0.041)	0.081** (0.041)	0.079* (0.041)	0.074* (0.041)
<i>Common language</i>	0.278*** (0.049)	0.252*** (0.059)	0.249*** (0.060)	0.264*** (0.059)	0.264*** (0.060)
<i>Former colony</i>	-0.009 (0.051)	-0.023 (0.053)	-0.023 (0.053)	-0.020 (0.053)	-0.012 (0.054)
<i>Ln(GDP p.c.)_{donor}</i>	0.607*** (0.016)	0.602*** (0.017)	0.602*** (0.017)	0.601*** (0.017)	0.602*** (0.017)
<i>Pop. (in mio.)_{donor}</i>	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
<i>Fuel exports (% of merchandise exports)</i>	0.002*** (0.001)	0.004*** (0.001)	0.006*** (0.002)	0.003*** (0.001)	0.012*** (0.002)
<i>Regulatory quality</i>		0.072 (0.049)	0.044 (0.051)		
<i>Fuel exports × Regulatory quality</i>			0.002 (0.002)		
<i>Corruption control</i>				-0.134*** (0.041)	-0.213*** (0.045)
<i>Fuel exports × Corruption control</i>					0.012*** (0.002)
Disaster dummies	Yes	Yes	Yes	Yes	Yes
Constant	-1.694*** (0.350)	-1.589*** (0.390)	-1.688*** (0.398)	-2.042*** (0.400)	-1.910*** (0.407)
N	26811	22246	22246	22246	22246

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is aid, a dummy that switches to 1 if the donor has made a contribution. ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 7: Aid & bilateral TRADE – 2nd stage

$Pr(bilateral = 1 X)$	(1)	(2)	(3)	(4)	(5)
$Ln(Fatalities)$	0.017 (0.014)	0.014 (0.015)	0.014 (0.015)	0.013 (0.015)	0.018 (0.015)
$Ln(Affected)$	0.035*** (0.004)	0.028*** (0.005)	0.028*** (0.005)	0.025*** (0.006)	0.022*** (0.006)
$Ln(GDP\ p.c.)$	-0.147*** (0.040)	-0.133*** (0.044)	-0.148*** (0.045)	-0.149*** (0.048)	-0.154*** (0.049)
$Ln(Population)$	-0.254*** (0.029)	-0.244*** (0.031)	-0.257*** (0.031)	-0.240*** (0.031)	-0.253*** (0.032)
$Trade\ (\% \text{ of } GDP)$	-0.002** (0.001)	-0.002* (0.001)	-0.002** (0.001)	-0.002** (0.001)	-0.002* (0.001)
$Distance$	-0.055*** (0.008)	-0.064*** (0.009)	-0.062*** (0.009)	-0.063*** (0.010)	-0.062*** (0.010)
$Affinity\ index$	0.469* (0.271)	0.387 (0.296)	0.356 (0.298)	0.388 (0.298)	0.360 (0.298)
$Common\ religion$	-0.007 (0.064)	0.003 (0.075)	-0.001 (0.076)	0.001 (0.075)	0.008 (0.076)
$Common\ language$	0.165** (0.079)	0.049 (0.105)	0.036 (0.104)	0.066 (0.104)	0.015 (0.105)
$Former\ colony$	-0.222*** (0.084)	-0.257*** (0.093)	-0.271*** (0.092)	-0.258*** (0.093)	-0.236** (0.094)
$Ln(GDP\ p.c.)_{donor}$	-0.159*** (0.048)	-0.150*** (0.048)	-0.160*** (0.048)	-0.156*** (0.048)	-0.173*** (0.051)
$Trade\ with\ donor$	0.124*** (0.014)	0.119*** (0.015)	0.142*** (0.017)	0.120*** (0.015)	0.188*** (0.023)
$Regulatory\ quality$		0.027 (0.069)	-0.184* (0.106)		
$Trade\ with\ donor \times$ $Regulatory\ quality$			0.055*** (0.021)		
$Corruption\ control$				0.102 (0.088)	-0.398** (0.158)
$Trade\ with\ donor \times$ $Corruption\ control$					0.117*** (0.028)
Disaster dummies	Yes	Yes	Yes	Yes	Yes
ρ	0.973*** (0.130)	0.970*** (0.132)	0.950*** (0.132)	0.964*** (0.135)	0.918*** (0.140)
Constant	3.840*** (0.750)	3.735*** (0.803)	4.071*** (0.811)	3.957*** (0.843)	4.052*** (0.852)
Log likelihood	-7546.738	-6398.397	-6394.050	-6386.357	-6356.830
N	3284	2757	2757	2757	2757

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is bilateral, a dummy that switches to 1 if the aid flow was bilateral. ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 8: Aid & Bilateral TRADE – 1st stage

$Pr(aid = 1 Z)$	(1)	(2)	(3)	(4)	(5)
<i>Ln(Fatalities)</i>	0.135*** (0.008)	0.128*** (0.008)	0.128*** (0.008)	0.128*** (0.008)	0.136*** (0.008)
<i>Ln(Affected)</i>	0.062*** (0.003)	0.055*** (0.004)	0.055*** (0.004)	0.060*** (0.004)	0.057*** (0.004)
<i>Ln(GDP p.c.)</i>	-0.197*** (0.017)	-0.205*** (0.021)	-0.205*** (0.021)	-0.149*** (0.022)	-0.161*** (0.022)
<i>Ln(Population)</i>	-0.399*** (0.015)	-0.372*** (0.016)	-0.372*** (0.016)	-0.374*** (0.016)	-0.384*** (0.016)
<i>Trade (% of GDP)</i>	-0.005*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)	-0.004*** (0.001)
<i>Distance</i>	-0.050*** (0.004)	-0.053*** (0.004)	-0.052*** (0.004)	-0.052*** (0.004)	-0.053*** (0.004)
<i>Affinity index</i>	-0.661*** (0.092)	-0.647*** (0.101)	-0.649*** (0.101)	-0.645*** (0.101)	-0.698*** (0.102)
<i>Common religion</i>	0.130*** (0.034)	0.100*** (0.038)	0.100*** (0.039)	0.103*** (0.039)	0.112*** (0.039)
<i>Common language</i>	0.216*** (0.048)	0.212*** (0.057)	0.211*** (0.057)	0.216*** (0.056)	0.190*** (0.057)
<i>Former colony</i>	-0.227*** (0.051)	-0.226*** (0.054)	-0.225*** (0.054)	-0.226*** (0.054)	-0.208*** (0.054)
<i>Ln(GDP p.c.)_{donor}</i>	0.514*** (0.017)	0.516*** (0.018)	0.516*** (0.018)	0.516*** (0.018)	0.515*** (0.018)
<i>Pop. (in mio.)_{donor}</i>	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
<i>Trade with donor</i>	0.136*** (0.008)	0.126*** (0.009)	0.127*** (0.010)	0.127*** (0.009)	0.176*** (0.011)
<i>Regulatory quality</i>		0.018 (0.035)	0.001 (0.049)		
<i>Trade with donor × Regulatory quality</i>			0.005 (0.010)		
<i>Corruption control</i>				-0.191*** (0.036)	-0.515*** (0.052)
<i>Trade with donor × Corruption control</i>					0.085*** (0.010)
Disaster dummies	Yes	Yes	Yes	Yes	Yes
Constant	1.209*** (0.376)	0.937** (0.422)	0.935** (0.422)	0.397 (0.418)	0.445 (0.421)
N	26585	22259	22259	22259	22259

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is aid, a dummy that switches to 1 if the donor has made a contribution. ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 9: Aid & bilateral OIL -CASH - 2nd stage

$Pr(cash = 1 V)$	(1)	(2)	(3)	(4)	(5)
<i>Ln(Fatalities)</i>	-0.060** (0.023)	-0.042 (0.027)	-0.055* (0.028)	-0.044 (0.027)	-0.043* (0.026)
<i>Ln(Affected)</i>	0.014 (0.009)	0.008 (0.010)	0.001 (0.011)	-0.001 (0.010)	0.001 (0.010)
<i>Ln(GDP p.c.)</i>	-0.094* (0.053)	-0.152** (0.064)	-0.220*** (0.079)	-0.189*** (0.072)	-0.184** (0.072)
<i>Ln(Population)</i>	0.045 (0.041)	0.028 (0.046)	0.027 (0.046)	0.030 (0.045)	0.031 (0.046)
<i>Trade (% of GDP)</i>	0.003** (0.001)	0.002 (0.002)	0.002 (0.002)	0.003 (0.002)	0.003* (0.002)
<i>Distance</i>	0.011 (0.013)	-0.017 (0.015)	-0.014 (0.015)	-0.017 (0.015)	-0.016 (0.015)
<i>Affinity index</i>	-0.129 (0.302)	-0.215 (0.337)	-0.243 (0.337)	-0.191 (0.334)	-0.183 (0.333)
<i>Common religion</i>	0.199** (0.092)	0.175 (0.109)	0.170 (0.109)	0.149 (0.108)	0.147 (0.108)
<i>Common language</i>	-0.153 (0.120)	-0.289* (0.168)	-0.277 (0.169)	-0.272 (0.169)	-0.276 (0.170)
<i>Former colony</i>	-0.369*** (0.129)	-0.553*** (0.166)	-0.557*** (0.166)	-0.551*** (0.168)	-0.567*** (0.164)
<i>Ln(GDP p.c.)_{donor}</i>	-0.187*** (0.060)	-0.154** (0.068)	-0.164** (0.066)	-0.159** (0.066)	-0.159** (0.066)
<i>Fuel exports (% of merchandise exports)</i>	-0.001 (0.002)	0.002 (0.002)	-0.004 (0.004)	0.001 (0.002)	-0.003 (0.005)
<i>Regulatory quality</i>		0.228* (0.119)	0.390** (0.157)		
<i>Fuel exports × Regulatory quality</i>			-0.008 (0.005)		
<i>Corruption control</i>				0.302** (0.140)	0.341** (0.146)
<i>Fuel exports × Corruption control</i>					-0.006 (0.007)
Disaster dummies	Yes	Yes	Yes	Yes	Yes
ρ	-0.102 (0.141)	-0.044 (0.158)	-0.057 (0.154)	-0.052 (0.153)	-0.052 (0.153)
Constant	-0.170 (0.955)	0.448 (1.028)	1.257 (1.171)	0.994 (1.106)	0.901 (1.098)
Log likelihood	-6631.837	-5529.674	-5527.802	-5526.460	-5511.599
N	3158	2632	2632	2632	2632

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is cash, a dummy that switches to 1 if the bilateral aid contribution was cash. ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 10: Aid & bilateral TRADE -CASH – 2nd stage

$Pr(cash = 1 V)$	(1)	(2)	(3)	(4)	(5)
$Ln(Fatalities)$	-0.035 (0.026)	-0.032 (0.027)	-0.033 (0.028)	-0.033 (0.027)	-0.039 (0.029)
$Ln(Affected)$	0.019** (0.010)	0.008 (0.010)	0.007 (0.010)	0.003 (0.011)	-0.002 (0.011)
$Ln(GDP\ p.c.)$	-0.171*** (0.060)	-0.149** (0.068)	-0.152** (0.069)	-0.189*** (0.073)	-0.170** (0.074)
$Ln(Population)$	-0.082 (0.066)	-0.051 (0.069)	-0.051 (0.071)	-0.048 (0.070)	-0.030 (0.075)
$Trade\ (\% \text{ of } GDP)$	0.002 (0.001)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)	0.002 (0.002)
$Distance$	0.018 (0.012)	-0.008 (0.014)	-0.005 (0.014)	-0.007 (0.014)	-0.001 (0.015)
$Affinity\ index$	-0.304 (0.294)	-0.307 (0.322)	-0.324 (0.323)	-0.325 (0.322)	-0.321 (0.320)
$Common\ religion$	0.249*** (0.086)	0.206** (0.101)	0.203** (0.101)	0.201** (0.101)	0.201** (0.101)
$Common\ language$	-0.134 (0.116)	-0.239 (0.154)	-0.253* (0.152)	-0.224 (0.154)	-0.282* (0.150)
$Former\ colony$	-0.431*** (0.125)	-0.543*** (0.153)	-0.549*** (0.153)	-0.544*** (0.154)	-0.516*** (0.156)
$Ln(GDP\ p.c.)_{donor}$	-0.173** (0.070)	-0.173** (0.071)	-0.182** (0.073)	-0.177** (0.071)	-0.216*** (0.071)
$Trade\ with\ donor$	0.078*** (0.029)	0.049 (0.031)	0.057* (0.032)	0.049 (0.031)	0.091** (0.041)
$Regulatory\ quality$		0.009 (0.097)	-0.100 (0.147)		
$Trade\ with\ donor \times$ $Regulatory\ quality$			0.027 (0.029)		
$Corruption\ control$				0.170 (0.132)	-0.266 (0.227)
$Trade\ with\ donor \times$ $Corruption\ control$					0.094** (0.038)
Disaster dummies	Yes	Yes	Yes	Yes	Yes
ρ	0.052 (0.197)	-0.004 (0.198)	-0.026 (0.206)	-0.009 (0.199)	-0.134 (0.210)
Constant	1.650* (0.980)	1.522 (1.053)	1.623 (1.058)	1.978* (1.106)	1.920* (1.100)
Log likelihood	-6908.274	-5846.983	-5846.317	-5784.745	-5784.063
N	3284	2757	2757	2757	2757

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is cash, a dummy that switches to 1 if the bilateral aid contribution was cash. ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 11: Aid & bilateral OIL – 2nd stage - Robustness Test OECD vs. NON-OECD

<i>Pr(bilateral = 1 X)</i>	(1)	(2)	(3)	(4)
OECD				
<i>Ln(Fatalities)</i>	-0.060*** (0.006)	-0.057*** (0.019)	-0.066*** (0.017)	-0.062*** (0.017)
<i>Ln(Affected)</i>	0.006 (0.007)	0.008 (0.008)	-0.012 (0.008)	-0.008 (0.008)
<i>Ln(GDP p.c.)</i>	-0.067 (0.064)	-0.053 (0.078)	-0.128* (0.069)	-0.113 (0.070)
<i>Fuel exports (% of merchandise exports)</i>	0.009*** (0.002)	0.011*** (0.004)	0.007*** (0.002)	-0.004 (0.005)
<i>Regulatory quality</i>	0.540*** (0.119)	0.504*** (0.157)		
<i>Fuel exports × Regulatory quality</i>		0.002 (0.005)		
<i>Corruption control</i>			0.550*** (0.134)	0.652*** (0.140)
<i>Fuel exports × Corruption control</i>				-0.017** (0.004)
NON-OECD				
<i>Ln(Fatalities)</i>	-0.088** (0.046)	-0.100** (0.051)	-0.107** (0.046)	-0.102** (0.044)
<i>Ln(Affected)</i>	0.033* (0.017)	0.022 (0.024)	-0.002 (0.018)	0.001 (0.019)
<i>Ln(GDP p.c.)</i>	-0.064 (0.161)	-0.157 (0.089)	-0.337 (0.208)	-0.290 (0.197)
<i>Fuel exports (% of merchandise exports)</i>	-0.000 (0.004)	-0.007 (0.010)	-0.003 (0.003)	-0.026** (0.011)
<i>Regulatory quality</i>	0.631** (0.305)	0.886* (0.512)		
<i>Fuel exports × Regulatory quality</i>		-0.009 (0.014)		
<i>Corruption control</i>			0.901** (0.372)	1.424*** (0.396)
<i>Fuel exports × Corruption control</i>				-0.035** (0.017)

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is bilateral, a dummy that switches to 1 if the aid flow was bilateral. ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 12: Aid & bilateral TRADE – 2nd stage - Robustness Test OECD vs. NON-OECD

<i>Pr(bilateral = 1 X)</i>	(1)	(2)	(3)	(4)
OECD				
<i>Ln(Fatalities)</i>	-0.072*** (0.016)	-0.070*** (0.016)	-0.074*** (0.016)	-0.070*** (0.017)
<i>Ln(Affected)</i>	0.006 (0.006)	0.007 (0.006)	0.001 (0.007)	-0.000 (0.007)
<i>Ln(GDP p.c.)</i>	-0.058 (0.061)	-0.070 (0.061)	-0.111* (0.065)	-0.108* (0.065)
<i>Trade with donor</i>	0.106*** (0.021)	0.135*** (0.024)	0.107*** (0.021)	0.153*** (0.030)
<i>Regulatory quality</i>	-0.057 (0.086)	-0.332** (0.134)		
<i>Trade with donor</i> × <i>Regulatory quality</i>		0.069** (0.028)		
<i>Corruption control</i>			0.234** (0.117)	-0.148 (0.216)
<i>Trade with donor</i> × <i>Corruption control</i>				0.081** (0.038)
NON-OECD				
<i>Ln(Fatalities)</i>	-0.077** (0.041)	-0.074* (0.041)	-0.088** (0.046)	-0.080* (0.044)
<i>Ln(Affected)</i>	0.022 (0.015)	0.025 (0.016)	-0.013 (0.016)	-0.022 (0.016)
<i>Ln(GDP p.c.)</i>	-0.057 (0.140)	-0.062 (0.145)	-0.354* (0.190)	-0.335* (0.192)
<i>Trade with donor</i>	-0.022 (0.036)	0.027 (0.051)	-0.030 (0.035)	-0.113 (0.075)
<i>Regulatory quality</i>	0.432** (0.194)	0.205 (0.278)		
<i>Trade with donor</i> × <i>Regulatory quality</i>		0.082 (0.066)		
<i>Corruption control</i>			1.053*** (0.355)	0.294 (0.464)
<i>Trade with donor</i> × <i>Corruption control</i>				0.196** (0.088)

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is bilateral, a dummy that switches to 1 if the aid flow was bilateral. ***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 13: Aid & bilateral OIL - CASH- Robustness Test OECD vs. NON-OECD

$Pr(cash = 1 V)$	(1)	(2)	(3)	(4)
OECD				
<i>Ln(Fatalities)</i>	-0.079*** (0.019)	-0.091*** (0.020)	-0.079*** (0.019)	-0.079*** (0.019)
<i>Ln(Affected)</i>	0.017** (0.008)	0.009 (0.009)	0.009 (0.009)	0.012 (0.009)
<i>Ln(GDP p.c.)</i>	-0.170*** (0.063)	-0.244*** (0.077)	-0.181*** (0.067)	-0.172** (0.068)
<i>Fuel exports (% of merchandise exports)</i>	0.003 (0.002)	-0.004 (0.004)	0.001 (0.002)	-0.008* (0.005)
<i>Regulatory quality</i>	0.299*** (0.112)	0.475*** (0.145)		
<i>Fuel exports × Regulatory quality</i>		-0.010* (0.005)		
<i>Corruption control</i>			0.264** (0.124)	0.347*** (0.128)
<i>Fuel exports × Corruption control</i>				-0.014** (0.007)
NON-OECD				
<i>Ln(Fatalities)</i>	-0.006 (0.048)	-0.023 (0.051)	-0.008 (0.049)	-0.005 (0.051)
<i>Ln(Affected)</i>	-0.000 (0.017)	-0.017 (0.026)	-0.013 (0.023)	-0.019 (0.024)
<i>Ln(GDP p.c.)</i>	0.161 (0.152)	0.012 (0.208)	-0.020 (0.199)	-0.008 (0.196)
<i>Fuel exports (% of merchandise exports)</i>	-0.010* (0.005)	-0.019* (0.011)	-0.007 (0.005)	0.005 (0.025)
<i>Regulatory quality</i>	-0.125 (0.305)	0.173 (0.408)		
<i>Fuel exports × Regulatory quality</i>		-0.013 (0.013)		
<i>Corruption control</i>			0.480 (0.426)	0.360 (0.437)
<i>Fuel exports × Corruption control</i>				0.021 (0.017)

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is cash, a dummy that switches to 1 if the bilateral aid contribution was cash.

***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 14: Aid & bilateral TRADE-CASH - Robustness Test OECD vs. NON-OECD

$Pr(cash = 1 V)$	(1)	(2)	(3)	(4)
OECD				
$Ln(Fatalities)$	-0.065*** (0.018)	-0.064*** (0.018)	-0.064*** (0.018)	-0.060*** (0.018)
$Ln(Affected)$	0.016** (0.008)	0.017** (0.008)	0.013 (0.008)	0.013* (0.008)
$Ln(GDP\ p.c.)$	-0.167*** (0.062)	-0.170*** (0.062)	-0.187*** (0.066)	-0.180*** (0.066)
<i>Trade with donor</i>	0.063*** (0.023)	0.068*** (0.024)	0.064*** (0.023)	0.105*** (0.027)
<i>Regulatory quality</i>	0.082 (0.098)	0.009 (0.172)		
<i>Trade with donor</i> × <i>Regulatory quality</i>		0.015 (0.030)		
<i>Corruption control</i>			0.143 (0.115)	-0.285 (0.215)
<i>Trade with donor</i> × <i>Corruption control</i>				0.077** (0.032)
NON-OECD				
$Ln(Fatalities)$	0.010 (0.042)	0.019 (0.043)	0.000 (0.044)	0.022 (0.048)
$Ln(Affected)$	-0.021 (0.019)	-0.019 (0.020)	-0.033 (0.022)	-0.047** (0.024)
$Ln(GDP\ p.c.)$	0.129 (0.145)	0.081 (0.150)	-0.052 (0.181)	-0.065 (0.180)
<i>Trade with donor</i>	-0.050 (0.043)	0.010 (0.056)	-0.090 (0.065)	-0.080 (0.064)
<i>Regulatory quality</i>	-0.210 (0.231)	-0.554** (0.270)		
<i>Trade with donor</i> × <i>Regulatory quality</i>		0.130* (0.073)		
<i>Corruption control</i>			0.457 (0.372)	-0.161 (0.504)
<i>Trade with donor</i> × <i>Corruption control</i>				0.196** (0.092)

Notes: Probit estimates. Coefficients reported; robust standard errors in parentheses. Dependent variable is cash, a dummy that switches to 1 if the bilateral aid contribution was cash.

***, **, * indicate significance at the 1, 5 and 10%-level, respectively.

Table 15. Variable Definition and Source

Variable	Description	Source
Fatalities	Total number killed by a natural disaster	EM-DAT, CRED (2008)
Affected	Total number affected by a natural disaster	EM-DAT, CRED (2008)
Disaster dummies	Describe which type of natural disaster occurred.	EM-DAT, CRED (2008)
Emergency aid	Dummy variables describing the channel (bilateral vs. multilateral) and type (cash vs. in-kind) of emergency relief	FTS, OCHA (2009)
GDP	Real GDP per capita (US Dollars in 2000 prices)	Penn World Table Version 6.2
POP	Total Population expressed in thousands	World Bank, World Development Indicators
Distance	Distance between donor's and recipient's capitals	World Bank, World Development Indicators
Trade	Exports plus Imports of goods and services divided by GDP	World Bank, World Development Indicators
Corruption control	Perception of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as influence of elites.	Kaufmann et al. (2008)
Regulatory quality	Perception of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development.	Kaufmann et al. (2008)
Governance	Replaces either Corruption control or Regulatory quality in Table 16	Kaufmann et al. (2008)
Democracy	Proxy for the political system in a country. Includes information on competitiveness and openness of executive recruitment, constraints on chief executive, regulation and competitiveness of participation.	Marshall & Jaggers (2005)
Affinity index	Extended Gartzke index on voting patterns in the UN General Assembly. Takes a value between -1 (donor and recipient never voted the same and 1 donor and recipient always voted the same.	Voeten and Merdzanovic (2009)
Former colony	Dummy variable 1 = recipient was once donor's colony	Correlates of War 2 Project (2008)

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On the Channel and Type of International Disaster Aid

Abstract

Research suggests that a donor country's decision to provide post-disaster assistance is not only driven by the severity of a disaster and the resulting humanitarian needs in the recipient country but also by strategic considerations. We argue that the identification of the determinants of the size of disaster assistance is a first step in the analysis of the donor's behavior. Since all aid is not motivated by the same reasons, the evaluation of the donor country's behavior requires a second step accounting for the type and the channel of aid provided. Using data on international disaster assistance between 2000 and 2007 one can examine both the donor countries' decision on the channel (bilateral vs. multilateral) and the type of disaster relief (cash vs. in-kind). The empirical results suggest that international disaster relief is not as much driven by the needs of the recipient country but also by strategic interests (e.g. oil, trade relationships) of the donor country. Bilateral and cash transfers are used as a vehicle to signal strategic interests, while multilateral and in-kind transfers are chosen to control for misuse in badly governed recipient countries.

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