

The Role of Media Exposure on Coordination in the Humanitarian Setting

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Despite high demand and resource limitations, humanitarian organizations (HOs) typically do not share resources and/or coordinate in the field. While coordination enhances operational performance and saves costs, the general perception is that it dilutes the media attention that individual organizations might receive, and negatively influences their future donation income. In this study, we empirically unveil the impact of media exposure and operational performance on the donations obtained by HOs. Then, based on the empirical results, we develop a stylized model to characterize the structure of preferred coordination policies with respect to an organization's funding source and main mandate. Our findings shed light on the incentives and dynamics that drive behaviors in humanitarian operations and provide insights for policy makers on designing and implementing mechanisms that encourage humanitarian coordination.

Key words: humanitarian logistics; horizontal coordination; media exposure

History: Received: January 2016; Accepted: September 2016 by Martin Starr, after 2 revisions.

1. Introduction

While budget limitation is a major concern of humanitarian organizations (HOs), demand for humanitarian actions and donor expectation of HO accountability are both rapidly rising (Toyasaki and Wakolbinger 2014). This has driven HOs to seek solutions to further optimize resource usage and gain economic efficiencies while preserving or enhancing the quality of services they currently offer to beneficiaries. One possible solution to achieving both economic efficiencies and service level enhancement is *coordination* (Corbett et al. 1999)—“the alignment of the operational activities of a group of organizations in a way that increases performance or effectiveness” (Ergun et al. 2014).

Humanitarian organizations can coordinate in many areas, and at different levels. For example, in the field, they can share information related to the disaster situation, the number of people affected, and availability of resources such as foods, medicines, and humanitarian workers (Altay and Pal 2014). They can jointly prioritize target beneficiary groups and divide

tasks to avoid duplications (Balcik et al. 2010). Diffusion of risk and uncertainty, improved public accountability and greater service quality are a few advantages of many that are derived through coordination (Balcik et al. 2010, Gazley and Brudney 2007). Therefore, large donors and international organizations have recently begun to pay more attention to coordinating humanitarian operations. For example, the United Nations (UN) has launched several programs including the establishment of the logistics support system (LSS) to facilitate communication among HOs. During the period of 2006–2008, the UN invested over 57 million USD into the Cluster Approach project which aimed to expand the overall capacity of relief systems through HO coordination in different sectors of activities such as logistics, nutrition, health, agriculture, education, and sanitation (Humphries 2013).

Despite these emerging initiatives, *horizontal coordination*, in which competitors providing similar services coordinate, has not been a priority on HOs' agendas. Scholars and practitioners have emphasized the scarcity of humanitarian coordination and the

resulting inefficiency in field operations manifested through effort and resource duplications (e.g., Altay and Labonte 2014, Chang et al. 2011, Thévenaz and Resodihardjo 2010; Van Wassenhove 2006). HOs have attributed the lack of coordination to many different reasons: (i) differences in organizational structure (Schulz and Blecken 2010, Stephenson 2005), strategic plans, and donors' interests (e.g., different priorities and objectives), (ii) lack of mutual trust and respect (particularly between a large international organization and a local agency), (iii) unfavorable operational conditions (Schulz and Blecken 2010, Stephenson 2005), (iv) high level of demand and supply uncertainty¹(Moshtari and Goncalves 2011), and (v) concerns of funding structure and public exposure (Balcik et al. 2010, Schulz and Blecken 2010, Thévenaz and Resodihardjo 2010, Van Wassenhove 2006). To the best of our knowledge, none of these disincentives has been empirically or analytically researched. Focusing on the impact of public exposure on humanitarian coordination, this study takes an initial step to fill this research void.

The impact of media exposure and operational performance on coordination decisions can be analyzed based on "Resource Dependence Theory" (RDT). This theory explains how dependence on external resources influences organization's strategic and tactical decisions (Pfeffer and Salancik 2003). The degree of resource dependence of an organization is determined by the importance and concentration of the resources (Froelich 1999). Accordingly, in a nonprofit sector, understanding the revenue structure and firm's dependence on specific sources of donation is essential for analyzing the way organizations behave (Hodge and Piccolo 2005, Macedo and Carlos Pinho 2006). Therefore, to analyze HO's willingness to coordinate, we first need to understand the reaction of donors to HO's media exposure and its operational performance.

Securing adequate funding requires a nonprofit to interact with donors such as institutional entities and individuals who control resources (Verschuere and De Corte 2014) or obtain their attention (Macedo and Carlos Pinho 2006). Minear et al. (1996) extensively discuss the relationship between media, governmental policy makers, and HOs during man-made disasters such as civil wars, and depict how powerful the impact of media is. HOs typically vie for media attention as they believe publicity attracts funding and donations (Tomasini et al. 2010, Toyasaki and Wakolbinger 2014). The desire to attract media attention, especially during the early stages of relief response, prevents HOs to even share operational information with other organizations (Balcik et al. 2010, Stephenson 2005, Stephenson and Schnitzer 2006). Seaman (1999) states that the importance of media visibility

for relief agencies "might even cause HOs to act in ways contrary to what they believe to be appropriate." Media attention, particularly TV coverage like CNN, obviously relates to brands seen on the screen. If multiple organizations collaborate, media attention is divided among many or it may be only one of them that gets featured while others are not.²

Simultaneously, big donors increasingly demand HOs to improve accountability and operational performance. Therefore, resource dependency might cause positive changes in a nonprofit (Prasad et al. 2016); they might coordinate if big donors' interests are aligned. Hence, in the nonprofit sector, resource dependence could have strong, yet opposite, effects on HOs' decisions. On one hand, to increase individual donations through more exclusive media exposure, HOs might decrease coordination intensity with their peers. On the other hand, to increase institutional donations through improved operational performance, they might coordinate with their counterparts to operate more effectively.

Although media exposure has long been assumed to have a significant impact on charitable donations, there is little scientific evidence to support this prevalent view. Considering media exposure and operational performance of 23 medium- and large-size HOs, over an average of 10 years, we study the impact of these components on organizations' annual received donations in the first part of the paper. We distinguish the effect of independent variables on two main sources of funding—*individual donations* (i.e., public support) and *institutional donations* (i.e., donations from governmental and nongovernmental entities). Our results demonstrate that media exposure affects both individual and institutional donations, albeit with different timings. In particular, media exposure has a positive effect on individual donations *in the same year* and on institutional donations *in the next year* while operational performance only influences institutional donations in the next year. Evidence from the literature and from our discussions with HOs indicate resistance to coordination for fear of diluting media exposure because this may translate into lower donation revenue. Our empirical findings show that this concern is well founded.

The second part of the paper builds on the empirical relationship between donations, media exposure, and operational performance by defining a stylized model of this relationship and its impact on HO's coordination effort. We characterize how an HO's preferred intensity of coordination is affected by the nature of an HO's mission and its operating environment. Results of our model show that decisions regarding the intensity of coordination highly depend on organizations' sensitivity to media exposure and the impact of operational performance on donation

income. Interestingly, while media exposure has an overall smaller impact on institutional donations, our results illustrate that the HOs whose main source of funding is institutional donations are more willing to coordinate with their counterparts than those whose source of funding is individual donations. Overall, our study shows that HOs' reservation toward peer coordination, though not ideal for beneficiaries at large, is well founded. Finally, we model the effect of the general trend of increasing media intensity through the growing use of social media. Our results suggest that the impact of this trend on society is likely to be positive due to an increase in overall donations. However, we also find some risk that social welfare may decrease.

1.1. Related Literature

Coordination among commercial firms has been a topic of significant research in supply chain and operations management (e.g., Anupindi and Bassok 1999, Corbett et al. 1999, Li 2002). Nevertheless, due to the disparate set of incentives and idiosyncratic characteristics of humanitarian operations, it is unlikely that the standard coordination mechanisms derived from commercial supply chains can easily apply to HOs (e.g., coordination via contracts governing financial transfers between buyer and seller is not possible). The literature on humanitarian logistics has pictured the challenges, threats, and opportunities of coordination in humanitarian settings (Balcik et al. 2010, Kovacs and Spens 2010, Maon et al. 2009) and documented many examples of emerging initiatives, their successes and failures (e.g., Lindenberg and Bryant 2001, Schulz and Blecken 2010). However, horizontal coordination, despite its necessity in humanitarian operations, has only been considered in a few studies.

Considering an asset transfer mechanism among programs operated by a single organization, Bhattacharya et al. (2014) demonstrate that coordination between programs in a decentralized inventory system is beneficial both for the organization and society. Their analytical study, though inspiring, is limited to coordination within a single organization. Horizontal coordination between HOs has been analyzed in four recent studies. First, Ergun et al. (2014) focus on a setting of field collaboration in which refugee camps managed by different HOs coordinate to improve last-mile data management. Using an analytical approach, they introduce a cooperative game theory model that takes operational costs into account, and identifies the circumstances in which coordination enabled by IT tools is beneficial for all parties involved. Second, using agent-based modeling and simulations, Altay and Pal (2014) show that HO's coordination facilitates information flow that eventually enables humanitarian community to respond

quickly. Third, Toyasaki et al. (2016) use a news vendor model in the context of non-cooperative game theory, and analyze HOs' incentives for joining the United Nations Humanitarian Response Depot (UNHRD) network. Finally, Toyasaki and Wakolbinger (2016) analyze the costs and benefits of cooperative vs. non-cooperative fundraising mechanisms, and show that a cooperative fundraising mechanism is beneficial for HOs.

There exists a rich academic literature analyzing the effect of nonprofit characteristics, such as its religious orientation, size, experience, and number of programs that it runs (Kinsbergen and Tolsma 2013), and its fundraising policies on donation (e.g., Mungan and Yörük 2012, Ryzhov et al. 2015). Moreover, the impact of an organization's administration and fundraising costs on its funding have been well studied (e.g., Balsam and Harris 2014, Feigenbaum 1987). While growing, to the best of our knowledge, the existing literature is silent on whether, and to what extent, media exposure affects HO coordination behavior. A limited number of examples, such as Yörük (2012) and Brown and Minty (2008), analyze the impact of media exposure on HO funding during/after a particular event. For instance, Brown and Minty (2008) analyze the impact of media coverage on HO donation incomes during 100 days after the 2004 tsunami. Their data contain media citations in three nightly network news broadcasts and articles of two prominent newspapers (i.e., Wall Street Journal, New York Times), and internet-based public support to eight American HOs. Their study demonstrates that an additional story in a mainstream journal increases public support by 18.2%, on a daily average. Yörük (2012) studies the impact of media on charitable behavior. Based on a volunteer survey, he considers the impact of national fundraising campaign "Give Five" through media on public support. Interestingly, his survey analysis shows that media does not have a significant effect on charitable behavior.

While coordination may undermine an HO's public exposure, it can boost operational performance and reduce costs, indirectly stepping up HOs' capacity to cover a larger population of beneficiaries. Therefore, the main focus of this study is to analyze the trade-off between maximizing media exposure and operational performance. Combining empirical study and analytical modeling, this study extends the literature in several ways. First, the empirical section unveils the impact of media exposure on different sources of HO funding. To the best of our knowledge, this is an early step of a formal empirical investigation into the impact of media exposure on institutional and individual donations. Unlike Yörük (2012) and Brown and Minty (2008), this study is not limited to a specific campaign or disaster event; it considers the impact of

media on HO funding at an aggregated annual level. Moreover, we distinguish between individual and institutional donations and observe the impact of media and operational performance on each funding source. Finally, we incorporate only a few critical variables to better isolate the impact of media coverage and operational performance on donation incomes. Not only does our result show the relationship between media exposure and donations, it uncovers an important donation-source-dependent time effect of this relationship. Specifically, we show that donations from the general public are affected by the *immediate* media exposure whereas governmental donations have a *lagged* dependency on media exposure. Second, we assess the policy implications of our empirical findings. We derive an HO's preferred coordination behavior given the two opposing effects of coordination, namely improved operational performance but diluted media attention. Hence, our results provide insights for policy makers and major donors like the UN family agencies.

Third, the model presented in this study is not restricted to one specific mandate or funding source. Our model considers coordination in both relief operations and development programs and ties it up to the organization's source of funding. Thus, coordination decisions of a wide spectrum of HOs are considered; from those whose funding source is *only* public support and focus *only* on relief operations to those organizations whose funding source is *only* governmental donations and focus *only* on development programs. Moreover, our model is not limited to specific organizational priority. Organizations value operational performance vs. future donations differently. Our model takes this characteristic into account and considers the impact of organizational priority on the preferred intensity of coordination. Finally, our results can generalize from the humanitarian context to horizontal coordination among many nonprofit organizations whose budget comes from public donations, governmental, and non-governmental entities.

2. Impact of Media Exposure vs. Operational Performance on Donations

Assumptions—The purpose of this section is (i) to validate (or to reject) the assumed effect of media exposure on HOs' annual funding and, (ii) to understand the magnitude and timing of these variables on individual and institutional donations. Because academic literature in humanitarian logistics still is in rudimentary stage, it borrows theories from other disciplines. Accordingly, to support our assumptions, we benefit from a broader literature related to the nonprofit

sector. Based on volunteering surveys, conducted biennially from 1988 to 1996, Yörük (2012) demonstrates that media does not have a significant impact on individual donations. Nevertheless, Kent (1987), Seaman (1999), Tomasini and Van Wassenhove (2009), Balcik et al. (2010), and Starr and Van Wassenhove (2014) highlight the importance of media exposure in HO funding. Likewise, debates on the actual impact of operational performance on nonprofit funding continue. For example, Greenlee and Brown (1999), Okten and Weisbrod (2000), Yan and Sloan (2016), and Balsam and Harris (2014) show that donors are very sensitive to expense ratios, and that higher administration cost negatively impacts donations. Nunnenkamp and Öhler (2012) explain that institutional donors might be sensitive to operational performance while individual donations are not. In sharp contrast, however, Frumkin and Kim (2001) illustrate that there is no statistically significant relationship between administrative expense ratios and individual donations. They conclude that operational performance is not rewarded by donors and promote the idea that nonprofit must invest more in fundraising activities and attract donor attention. Because the impacts of media exposure and operational performance on funding are the underlying assumptions of our model, we prefer to empirically validate them.

While sudden-onset disasters often receive massive media attention during a short period of time, development programs might attract media citations gradually (Van Wassenhove 2006). Also, HOs' fundraising activities, and institutional donations occur over a fiscal year, rather than at a point in time. Therefore, it is reasonable to assume that media exposure and operational performance of one period may also influence funding in the following period (Hodge and Piccolo 2005). Consequently, in our model, the lag of these variables is also taken into consideration.

Concepts and explanatory variables—The concept of organizations' *public exposure* and its impact on their asset prices and funding have been studied in economics and management sciences (e.g., Liu et al. 2014). Public exposure is the extent to which an organization has publicity to its social environment (Miles 1987). Economists have applied different methods to measure an organization's public exposure. For instance, Brammer and Millington (2006) approximate a firm's public exposure with logarithm of its annual asset. Liu et al. (2014) measure an organization's public exposure through the incidence of news media stories that involve its name i.e., *media exposure* or *media citations*. Similarly, Mezner and Nigh (1995) measure an organization's public exposure by the number of stories concerning the organization in five US national daily newspapers over a period of 15 months.³

The second explanatory variable in our study is operational performance. Unfortunately, the nature of humanitarian operations makes it difficult to identify a simple and globally accepted indicator to assess HO performance (Eftekhar and Van Wassenhove 2016). Most of the suggested indicators are either subjective and difficult to measure, or case-specific depending on the type of humanitarian action.⁴ For many reasons, including the ease of calculation and accessibility, financial indicators are the most frequently used performance indices by donors to determine aid allocations (Baker et al. 2013, Privett and Erhun 2011, Sargeant et al. 2006, Tomasini et al. 2010). Likewise, watchdog organizations aggregate cost ratios of nonprofits so that donors can compare the performance of similar organizations. A generally used financial indicator is *program spending ratio* which is the percentage of an HO's total functional expenditures allocated to programs and services in the field (e.g., Frumkin and Kim 2001, Kinsbergen and Tolsma 2013).⁵

Data and operational measures—Our data collection includes 32 medium- and large-size HOs that have international exposure. We then excluded those organizations whose financial reports were either unclear or unmatched over years. Our final unbalanced panel dataset is created based on the financial information and media exposure of 23 HOs for which data were available for at least five consecutive years (Appendix A, Table A1). Financial data contain information such as annual individual donations, institutional donations, other incomes (such as interests gains), total assets, and expenditures (such as fundraising costs, management and administration costs, and programs/projects expenditures), all in USD. We measure operational performance defined as the ratio of operational cost used to run relief or development operations in the field (including personnel, equipment, and materials costs incurred during the operations) over the total expenditures, which also include fundraising costs, management, and administrative expenditures.

Our second source of data was Factiva database.⁶ Similar to Brammer and Millington (2006) and Liu et al. (2014), we applied an event analysis method to estimate HO's annual media exposure over the years of observation. To quantify the frequency of the news containing an HO's name, we searched for each organization in three languages; English, French, and Spanish. If necessary, we also searched in the official language of the country in which the organization's headquarters are based.⁷ To have a comprehensive search, we included all media sources such as Dow Jones newswires, major news and business publications, press release wires, Reuters newswires and, The Wall Street Journal, in addition to all

publications, all web news, blogs, and multimedia.⁸ This inclusive search was motivated by Yörük (2012) who shows that the effect of a particular media source on charitable donation is insignificant, meaning that all media sources have similar impact on total donation. Furthermore, Hunter et al. (2013) indicate that, in some situations, "*even marginal media may become mainstream.*" Therefore, it may not be straightforward to distinguish the importance of one newspaper or TV channel from another one.

We ran each search at two levels; headline and full text search. Headline search counts how many times an organization was mentioned in the headlines of news and was cited as the main subject while full article search counts how many times an organization had been cited in news body. Obviously, there is a large correlation between headline counts and full text counts. We used both proxies in our analysis but, as the results were consistent, we only report the results from models where full text was used as a proxy. Similar to Liu et al. (2014), we do not categorize media citations as either positive or negative (i.e., whether an organization is mentioned in the news in a positive or negative manner). Given the large number of media citations for many organizations, such classification would be very time consuming. Moreover, Cook et al. (2006) perform such a classification for a random subsample of 5452 of their articles and demonstrate that over 99% of these articles were primarily descriptive stories or news.

We ran our econometric model based on the logarithm of media citations. Using logarithm function can eliminate or mitigate the problem of conditional skewness which often occurs with strictly positive variables. Also, since we consider both mid-size and very large organizations, the standard deviation of proxies in our database is quite large. Because we use panel data analysis where the robustness of estimators can be questioned in the presence of outlying observations (Bramati and Croux 2007), we benefit from the logarithm function that narrows the range of a variable and makes our estimates less sensitive to outliers. Table A2 (in Appendix A), shows the descriptive statistics of the variables.

2.1. Econometric Model

We use a fixed effects estimation method to characterize the relationship between our explanatory variables and dependent variables. While this method is more conservative, it provides estimates that reflect inter-individual differences inherent in comparisons of different firms (Hsiao 2003, p. 5). In fact, the ability of panel data modeling to capture dynamic relationships between variables and control for unobserved heterogeneity makes it a suitable method for analyzing individual organization data (Wooldridge 2010,

p. 285). We used a fixed effects estimation method for several reasons; it allows arbitrary correlation between μ_i , unobserved variables that do not change over observation period and regressors (Wooldridge 2010, pp. 286, 301–302), and allows us to get rid of the effect of unobserved time-invariant variables (Hsiao 2003, pp. 8, 43). This is a realistic assumption for our study because it captures unobserved time-invariant information specific to each organization, such as HO's ideology or main mandates. Furthermore, we ran a Hausman test, and the null hypothesis of no correlation between unobserved time-invariant variables and regressors was rejected under this test, confirming our choice of a fixed effects model.

In explaining firms' behavior, one may extend the list of covariates ad infinitum. However, because control variables are treated similar to explanatory variables, Spector and Brannick (2011) advise against adding a new control variable without sufficient theoretical reasons. To better isolate the impact of media exposure and operational spending ratio on HO donation sources, we incorporate two critical control variables that have been used in most similar studies. First, following Steinberg (1986), Brammer and Millington (2006), Kinsbergen and Tolsma (2013), and Bose (2015), we consider organization's size as a control variable. Organization's size is also interpreted as a form of advertisement (Kinsbergen and Tolsma 2013, Yan and Sloan 2016). Therefore, similar to Yan and Sloan (2016), we use logarithm function of annual assets (i.e., anything tangible or intangible that is owned by the organization) to control for the size of HO. Second, following Weisbrod and Dominguez (1986), Posnett and Sandler (1989), Khanna et al. (1995), and Khanna and Sandler (2000), we control for the effect of fundraising expenses that, in nonprofit sector, are perceived as the same as advertising costs in commercial sector.

Finally, a challenge with our dataset was having an unbalanced panel data, which means our dataset has missing years for at least some cross sectional units in the sample. In this case, one degree of freedom is lost for every cross-sectional observation due to the time-demeaning (Wooldridge 2012, p. 491). Because at some periods we have missing values, we cannot assume that the time space is equally distributed. While this issue is usually ignored in most research using panel data analysis, we followed Baltagi and Wu (1999) that suggest a powerful procedure allowing for a variety of patterns of missing data, and for the serially correlated errors. We consider the following model:

$$y_{it1} = a_1 + Z_{it}\theta_1 + d_{it}\eta_1 + \mu_{i1} + u_{it1}, \quad (1)$$

$$y_{it2} = a_2 + Z_{it}\theta_2 + d_{it}\eta_2 + \mu_{i2} + u_{it2}, \quad (2)$$

where $i = 1, \dots, N$ is the index for HOs, $t = 1, \dots, T$ is the index for time in year. y_{it1} and y_{it2} represent

logarithm of individual donations, $\log(D_{it}^i)$, and institutional donations, $\log(D_{it}^I)$, respectively. Z_{it} is a vector of four independent explanatory variables that consists of the logarithm of media citations at year t , $\log(V_{it})$, and at year $t - 1$, $\log(V_{it-1})$, and operational performance at year t , X_{it} , and at year $t - 1$, X_{t-1} . d_{it} is a vector of two control variables and consists of logarithm of annual assets and total fundraising costs at year t , i.e., $\log(AST_{it})$ and $\log(FRC_{it})$. μ_{i1} and μ_{i2} denote the unobserved individual organization effects, a_1 , a_2 are intercepts, and u_{it1} , u_{it2} represent unobserved time-variant errors (see Appendix A for a list of notation). Note that we only consider a lag of one year. Although longer lags are theoretically more plausible, it was not possible to estimate longer lags with our limited dataset.⁹

3. Results: Interpreting the Difference of Individual and Institutional Donations

Results from our data analysis, presented in Table 1, indicate that the impact of media exposure and operational performance on HOs' funding varies with the source of the donation. In particular, donations from the general public (i.e., individual donations) are strongly influenced by media exposure in the *current* year. However, operational performance does not have any significant impact on this type of donations. In contrast, donations from governmental and non-governmental entities (i.e., institutional donations) are influenced by both operational performance and media exposure, but with a 1-year lag, that is, institutional donations are only affected by operational performance and media exposure in the *previous* year.

Table 1 Impact of Operational Performance and Public Exposure on Donations

Variable		Individual donations	Institutional donations
Operational performance	X_{it}	0.49 (0.74)	0.11 (0.65)
Operational performance of the previous year	X_{it-1}	0.51 (0.52)	0.92** (0.45)
Media citation	$\log(V_{it})$	0.26** (0.10)	0.01 (0.08)
Media citation of the previous year	$\log(V_{it-1})$	0.06 (0.07)	0.14* (0.07)
Assets	$\log(AST_{it})$	0.34** (0.13)	0.52*** (0.11)
Fundraising costs	$\log(FRC_{it})$	0.38** (0.14)	0.38** (0.11)
Intercept		1.46*** (0.43)	0.59* (0.34)
F		53.05***	48.43***
R ²		0.74	0.73
Observations		134	132

*10%, **5% and ***1% statistical significance, respectively. Numbers in parentheses show standard deviation.

Studies show that individual donations to charities are about a quarter of nonprofits' total funding (Bose 2015, Mungan and Yörük 2012). Individual donors typically judge an HO's ability by its visibility in public media and do not keep track of the HO's operational performance. Media exposure is thus a key input to the decisions of these donors. As the HO's participation in humanitarian efforts is observed by the media and reported to the public, it attracts new donations and the impact is immediately observable and reflected in the amount of public donations received. When an HO applies for governmental funding, it needs to demonstrate success in previous projects. Governmental and non-governmental entities who fund HOs maintain data on HOs' operational performance and use the data to determine future donations. Therefore, institutional donations are influenced by HOs' operational performance. In addition, institutional funding agencies are made up of individuals who are inevitably subject to the influence of the mainstream media, thus the donation decision of these agencies is also affected by HOs' media exposure.

The 1-year lag in the dependency of institutional donations on media exposure and operational performance has not been identified in any previous research on humanitarian donations but can be explained by the nature of institutional donation decisions. Often the current-year performance data for on-going projects are not yet fully available at the time of donation decisions and the funding agencies have to rely on previous-year data. In addition, there is a decision cycle time for donations from institutional sources and thus a lag between the time of the decision and the time of fund receipt by the HO. The decision cycle time also explains a similar lag in the effect of media exposure on institutional donations.

4. Coordination Policy Model

In this section, we define and analyze a stylized model of HO coordination efforts and performance in order to gain insight into actions by HOs and policy makers. Our analysis is limited to HOs that coordinate in development efforts or at the early stages of relief operations activities, which have a negative impact on media exposure and consequently donations.¹⁰

We model a trade-off between concerns for operational performance and funding that shape an HO's willingness to coordinate with other HOs on relief and development activities. We seek to expose factors that shape an HO's interest in coordinating relief and development activities with other HOs, and to understand whether changes in

parameters characterizing an HO's mission cause an HO to become more or less interested in coordinating. However, we do not make predictions on the coordination intensity among a group of HOs. Such predictions would rely on a detailed set of assumptions and a measure of coordination that govern strategic interactions among two or more HOs. At present, HOs do not report relief and development coordination, and the availability of such a measure is critical for guiding the formulation of a predictive model and assessing validity of its predictions.

Recall that results in section 3 indicate that media citations in a period (year) positively affect donations from individuals in the current period and donations from institutions in the following period. The HO's operating performance in the current period also positively affects donations from institutions in the following period. Let D_i and D_I denote the donations received by the HO due to media citations and operational performance in a period from individuals and institutions, respectively (see Appendix A for a list of notation). Let w denote the HO's intensity of coordination with one or more other HOs. We model donations as follows:

$$D_i = V(w), \quad (3)$$

$$D_I = \alpha V(w) + \beta X(w), \quad (4)$$

where $V(w)$ is total donation amount from individuals, which stems from media citations, $X(w)$ is the HO's operational performance, and $\alpha, \beta > 0$ correspond to the coefficients characterizing the influence of visibility and operational performance on institutional donations. We remark that the coefficients α and β also incorporate the time-lag effect of media visibility and operational performance on institutional donations.

Our model relies on two fundamental assumptions that are supported by the literature as well as by our interactions with many HOs: (i) HO operational performance exhibits diminishing marginal returns to coordination,¹¹ even to the point of becoming negative at high intensities of coordination as the cost of increased coordination exceeds the gain in efficiency (Ergun et al. 2014, Van Wassenhove 2006), and (ii), coordination divides media attention among HOs and thus reduces an individual HO's visibility (Balcik et al. 2010; Stephenson and Schnitzer 2006; Stephenson 2005).¹² The two fundamental assumptions listed above are formalized below.

ASSUMPTION 1. (i) $X(w)$ is continuously differentiable, concave, with $X'(0) > 0$. (ii) $V(w)$ is continuously differentiable, decreasing and concave.

We assume the HO's utility is given by

$$U = k_X X + k_i D_i + k_I D_I. \quad (5)$$

The coefficients in $\mathbf{k} := (k_X, k_i, k_I)$, $\mathbf{k} \geq 0$ denote the HO's *preference weight* on operational performance, individual donations, and institutional donations, respectively. In contrast to profit-maximizing organizations, HOs typically strive to accomplish both humanitarian goals (measured by operational performance) and fundraising goals (measured by the amount of donations) to ensure viability of the organization while meeting humanitarian missions (Khanna et al. 1995, Steinberg 1986, Thornton 2006, Toyasaki and Wakolbinger 2014). Depending on the mandate of each HO, the level of emphasis placed on individual vs. institutional donations varies, which is reflected in the relative magnitude of k_i and k_I . We can rewrite Equation (5) as

$$U = (k_X + \beta k_I)X + (k_i + \alpha k_I)V. \quad (6)$$

The expression illuminates the drivers of HO's utility. The sensitivity of HO's utility to X is determined by the sum of two elements—the marginal utility of operational performance (k_X) and the marginal utility of institutional donations (k_I) adjusted by the sensitivity of institutional donations to operational performance (β). The sensitivity of HO's utility to V is also determined by the sum of two elements—the marginal utility of individual donations (k_i) and the marginal utility of institutional donations (k_I) adjusted by the sensitivity of institutional donations to visibility (α). The expression also exposes the trade-off underlying coordination effort, with upward pressure coming from its effect on operational performance and downward pressure coming from its effect on visibility. The HO's preferred intensity of coordination, w^* , is the unique solution to

$$\frac{X'(w^*)}{-V'(w^*)} = \frac{k_i + \alpha k_I}{k_X + \beta k_I}. \quad (7)$$

(Due to Assumption 1, w^* is obtained from the first-order condition.)

4.1. Effect of Preference Weights and Donation Coefficients on Preferred Coordination

To understand the effects of changes in model parameters on preferred coordination intensity, we begin by describing the structure of function $f(w) := \frac{X'(w)}{-V'(w)}$, which defines the marginal rate of substitution between performance and media citations. At $w = 0$, $f(w)$ is positive and decreasing in w , at least for all w such that $f(w) \geq 0$; if $f(w)$ drops below zero as w increases (i.e., if X has a finite stationary point), then

$f(w)$ remains below zero as w continues to increase. Thus, the preferred coordination intensity w^* is decreasing in the right-hand side of Equation (7). This observation leads to the following comparative statics.

PROPOSITION 1. (i) w^* is decreasing in α and increasing in β . (ii) w^* is increasing in k_X and decreasing in k_i . (iii) w^* is increasing in k_I if and only if $\frac{k_i}{k_X} > \frac{\alpha}{\beta}$.

The intuition underlying Proposition 1(i) is clear from the opposing pressures on coordination effort explained above, i.e., an increase in α increases the sensitivity of institutional donations to media exposure, which increases the downward pressure on coordination, and an increase in β increases the sensitivity of institutional donations to operational performance, which increases the upward pressure on coordination. The result of Proposition 1(ii) is similarly clear, as k_X and k_i are preference weights on operational performance and media citations, respectively.

Proposition 1(iii) characterizes the impact of increasing the preference weight on institutional donations, k_I . The behavior is more nuanced because of opposing directional effects on institutional donations as coordination increases, i.e., while an increase in coordination improves operational performance putting upward pressure on institutional donations, it reduces the HO's media citations putting downward pressure on institutional donations. The directional effect on coordination as k_I increases is determined by how the HO's relative preference for individual donations vs. operational performance (k_i/k_X) compares with the relative sensitivities of institutional donations to media exposure vs. operational performance (α/β). For example, if the influence of media exposure is strong relative to operational performance (high α/β), then an HO responds to an increase in k_I by reducing coordination; in a setting where institutional donations are more sensitive to operational performance than media exposure (low α/β), the opposite is true.

Combining the empirical results and Proposition 1, media exposure positively affects funding and negatively affects HO's willingness to coordinate. The negative effect on coordination is unambiguous for HOs that prioritize individual donations (high k_i) but, as shown in Proposition 1(iii), can extend to HOs that prioritize institutional donations (high k_I). HOs' reservations toward peer coordination, although not ideal for the humanitarian mission at large, is unfortunately well founded.

Individual donations are critical for HOs. For example, in 2000, about 69% of American households made a donation with an average of \$1942 (Steinberg and Wilhelm 2003). Yet, HOs vary in their preference for

individual or institutional donations. Some HO's primarily depend on individual donations, whereas others primarily depend on institutional donations. For instance, our data show that, on average, about 95% of Doctors Without Borders' funding comes from individual donations while public supports only form 9% of the total income of Oxfam. Proposition 1 hints at how HO's priorities for individual vs. institutional donations affect willingness to coordinate. Because individual donations depend only on media citations, whereas institutional donations depend on both citations and operational performance, we may expect to see higher intensities of coordination among HO's that primarily rely on institutional donations. The following proposition indicates that this is a likely, but not an assured, result.

PROPOSITION 2. *Consider two cases: (1) $k_i = k$, $k_I = 0$, (2) $k_I = k$, $k_i = 0$. Let w_i^* denote the preferred coordination for case (1) and let w_I^* denote the preferred coordination for case (2). Then, $w_i^* < w_I^*$ if and only if $\frac{1-\alpha}{\beta} > -\frac{k}{k_I}$.*

Our empirical analysis in section 3 suggests that $\alpha < 1$ (i.e., individual donations are more sensitive to media citations than institutional donations), which is a sufficient condition for $w_i^* < w_I^*$. The sensitivity of institutional donations to media citations must be greater than the sensitivity of individual donations to citations and institutional donations must be relatively insensitive to operational performance for $w_i^* > w_I^*$ to occur.

Propositions 1 and 2 help us understand how the preferred intensity of coordination varies with an HO's strategic focus. For example, HO's that depend on individual donations for survival, usually place a higher emphasis on the amount of donations they receive. HO's that rely on constant institutional donations tend to focus more on performance, and therefore, are more willing to coordinate with others. For instance, to facilitate coordination efforts in the field, the International Federation of Red Cross and Red Crescent Societies (IFRC) has founded some regional hubs to preposition supplies that allow other organizations to access critical items during emergencies.

4.2. Implications for Relief Operations vs. Development Programs and for Social Welfare

Projects in which HO's participate can be development programs or relief operations. During a relief operation, HO's usually receive intense media attention. In contrast, development programs such as projects that aim to reduce hunger or improve education draw less spotlight to HO's (Tomasini and Van Wassenhove 2009). The 2004 Asia tsunami is a great example of immediate and large impact of relief operations,

combined with huge media coverage, on individual donations (El Nasser 2005). For example, Save the Children USA collected USD 6 million in the first four days following the disaster, while its typical monthly income through individual donations does not exceed a few hundred thousand dollars (Strom 2005).

We model the difference in media attention through parameter $\phi > 0$. In particular, we define the visibility function as

$$V(w) := \phi v(w) \quad (8)$$

where, to be consistent with Assumption 1, $v(w)$ is a continuously differentiable, decreasing and concave function of w . A larger value of ϕ means that an HO gets greater attention from its activities (e.g., relief operations have a higher ϕ value than development programs).

PROPOSITION 3. *w^* is decreasing in ϕ .*

From Proposition 3, all else equal, an HO's willingness to coordinate will be lower in relief operations than in development programs. In other words, while lack of media attention places development programs at a disadvantage in terms of gaining attention and financial support from the public, it promotes healthy coordination among HO's. This effect is most apparent for relief operations that depend heavily on public donations for which the lack of incentive to coordinate is most severe. Therefore, for highly visible relief operations, policy makers may consider designating some form of centralized agency to collect and allocate the funds from public donations in order to encourage coordination. In fact, some funding agencies are moving forward consolidated appeals for disaster relief in order to ensure coordination.

We are seeing growing use of social media, certainly in conjunction with disasters and relief operations (Yoo et al. 2016), and in coverage of daily events in general. In effect, media intensity is increasing, which is reflected in an increase in ϕ over time. From the perspective of an HO, an increase in ϕ would seem to translate into an increase in donations. However, Proposition 3 shows that it leads to a decline in willingness to coordinate. This raises another question: How does the propagation of social media influence the humanitarian benefit to society?

Consider the group of HO's that share a common mission that is supported by a pool of donors. Let $X^*(\phi) = X(w^*; \phi)$ denote the operational performance of a representative HO in the group given media intensity parameter ϕ . The operational performance of a representative HO matches the average operational performance among all HO's within the group. Let $D(\phi)$ denote total donations to the group,

i.e., total funding for the mission. The benefit of a humanitarian mission is realized only when donation funds transform to operational spending in the field of humanitarian operations. Thus, the social welfare associated with the mission can be characterized by

$$S(\phi) := D(\phi)X^*(\phi).$$

Since X measures the ratio of direct spending of field operations to total funding of the mission, we can interpret the value of $S(\phi)$ as the total funds that *directly* support the humanitarian mission.

While the growing use of social media may lead to an increase in total donations $D(\phi)$, it can also lower each HO's desired intensity of coordination $w^*(\phi)$, and negatively affect the operational performance $X^*(\phi)$. Whether or not social welfare improves depends on the relative sensitivities of these effects: if the ϕ -elasticity of operational performance $\frac{-\phi X^*(\phi)}{X^*(\phi)}$ is greater than the ϕ -elasticity of total donations $\frac{\phi D'(\phi)}{D(\phi)}$, then social welfare decreases as media intensity increases. Unfortunately, the more effective social media is in connecting the general public with humanitarian needs, the more likely it may drive HOs to devote more effort to grabbing media spotlight than working together to improve operational performance through coordination. This effect is most likely to occur for missions that are supported primarily by institutional funding. This is because total institutional support of a mission is likely to be relatively fixed and unaffected by increased media intensity even though media exposure does affect the allocation of the funding pool to individual HOs, i.e., the ϕ -elasticity of total donations to the mission is likely to be close to zero.

5. Managerial Insights

Discussions in sections 4.1–4.2 raise the question of what policy makers can do to counteract the negative effect of media attention and improve coordination in humanitarian operations. The findings in the analysis suggest several possible tactics that policy makers can adopt. Since the disincentive for coordination arises from the positive connection between an HO's media exposure and donations and the negative connection between coordination and the HO's media exposure, it is possible to dampen the negative effects by weakening or redirecting the connections.

For example, media coverage is of great importance for donations from individual donors, thus it is unwise to discourage media coverage on humanitarian operations. However, by establishing centralized agencies to collect and allocate donations from individual donors, donations received by each individual HO can be decoupled from its *own* media exposure.

This redirects the positive influence of media exposure on individual donations but avoids its negative impact on coordination. This insight contributes to the ongoing debate on how coordination among HOs is best implemented. There are two dominant schools of thought. The first approach, motivated by governmental and inter-governmental bodies, emphasizes a centralized, unified, and hierarchical structure (James 2008, p. 351). The second approach is based on a more decentralized approach to coordination (Humphries 2013). Our analysis suggests that a centralized funding policy can improve coordination among HOs. The UN's recent attempt to standardize the process of fund collection, i.e., the Consolidated Appeals Process, is well aligned with this conclusion. The UN has also created a Central Emergency Fund which is a shared pool of funds available to organizations with high field performance. Another example of such effort is the Consortium of British Humanitarian Agencies, established in 2010 by 15 UK based NGOs. Part of its goal is to establish an emergency response fund to enable quicker relief for affected populations.

As discussed in section 4.2, in emergency or disaster relief projects, HOs might act quite differently; HOs relying on individual donations and looking for media exposure may attempt to react to the disaster individually while HOs that rely on institutional donations might coordinate. In such circumstances, a centralized agency which handles disaster-relief fund allocation can direct funds to the appropriate HOs based on the functions performed by each organization. For HOs heavily depending on donations for survival, assurance of funds from the central agency may help them shift focus onto performance and increase coordination effort.

For institutional donations, the negative effect of media exposure on coordination can be reduced by training funding agencies to follow a systematic approach for evaluating HOs and allocating funds based on HOs' function and performance instead of ad hoc approaches which are more susceptible to individual perceptions and media influences. A systematic approach relies on collection and review of operational performance data over time that serve as a basis for funding decisions. Such data can be obtained from watchdog organizations and HO financial reports.

6. Conclusion and Future Study

In this study, we empirically examine the impact of media exposure and operational performance of 23 HOs on their funding and apply the empirical findings in an analytical model to study humanitarian coordination decisions, and how they are affected by HOs' concern of media exposure.

While media exposure has long been conjectured to have a significant impact on HO funding, no formal study has validated or rejected this assumption. Our empirical results confirm that media exposure has an immediate impact on individual donations while, contrary to our expectation, show that it also influences institutional donations, though with a time delay. We observe a similar delay in the effect of operational performance on institutional donations. To incorporate the differences in the dependencies of individual and institutional donations on media exposure and performance, we model individual and institutional donations separately. We show that an HO's preferred intensity of coordination varies with the organization's emphasis on fundraising vs. operational performance, reliance on individual vs. institutional donations, as well as the types of humanitarian projects in which the organization participates. HOs relying heavily on individual donations tend to be less willing to coordinate than those that rely on institutional donations. Furthermore, our results indicate that HOs engaging in relief operations would be less willing to coordinate than those engaging in development programs because the intense media coverage of relief operations often leads the HOs to be more protective of this advantage. Paradoxically, a lack of media attention in development programs can encourage coordination among HOs. The results suggest that centralized funding policies, which have recently been initiated by large international organizations such as the UN, can weaken the connection between an HO's media exposure and its funding, and promote coordination. Lastly, we consider the impact of the growing use of social media on social welfare. We find that the impact is not necessarily positive, especially for humanitarian missions that are largely supported by institutional funding.

Our findings should be viewed in light of some limitations that could be an avenue for further research. For example, although the assumption that coordination dilutes media exposure is supported by the prevailing view of the literature and the humanitarian society, there has been no formal empirical study on this. The nature and magnitude of this relationship may depend on the scope and intensity of coordination. It would be valuable to quantify this relation. In addition, we focus on one major disincentive of coordinating humanitarian operations, namely, an HO's concern of media attention. Analytical or empirical studies that take other incentives and disincentives into account should lead to further understanding of humanitarian coordination. These could include HO's mandate, ideological preferences, and organizational structure. Finally, it will be useful to extend our model to provide predictions on the degree of relief and development coordination activity among groups

of HOs. Such efforts may follow Toyasaki and Wakolbinger (2016) who use a game theoretic approach to make predictions on joint fundraising.

Acknowledgments

We are grateful to Martin Starr (Department Editor), and a Senior Editor for their clear and concise comments that helped us improve earlier versions of the paper. Likewise, we thank three anonymous reviewers for their valuable comments and feedback.

Appendix A. List of Organizations, Descriptive Statistics, and Notation for Econometric Model

Table A1 Available Data: Organization–Observation Period

	Organization	Data
1	International Federations of the Red Cross and Red Crescent Societies (IFRC)	1996–2012 (17 years)
2	Islamic Relief Worldwide (IRW)	1996–2012 (17 years)
3	Mercy Corps	1997–2012 (16 years)
4	International Committee of the Red Cross (ICRC)	1999–2012 (14 years)
5	Doctors Without Borders (MSF)	1999–2012 (14 years)
6	Habitat for Humanity	1999–2012 (14 years)
7	Feeding America	2000–2012 (13 years)
8	Oxfam International	2000–2012 (13 years)
9	Catholic Relief Services (CRS)	2000–2012 (13 years)
10	Danish Refugee Council (DRC)	2001–2012 (12 years)
11	Action Against Hunger (ACF)	2001–2012 (12 years)
12	Medical Emergency Relief International (Merlin)	2001–2012 (12 years)
13	Emergency Nutrition Network (ENN)	2003–2012 (11 years)
14	International Rescue Committee (IRC)	2002–2012 (11 years)
15	Concern Worldwide	2002–2012 (11 years)
16	CARE International	2002–2012 (10 years)
17	Compassion International	2004–2012 (9 years)
18	Riders for Health	2004–2012 (9 years)
19	TearFund	2004–2012 (9 years)
20	World Concern	2004–2012 (9 years)
21	Samaritan's Purse	2005–2012 (8 years)
22	Heifer International	2007–2012 (7 years)
23	AmeriCares	2007–2012 (5 years)

Econometric model notation:

D_{it}^i, D_{it}^I : individual and institutional donations to HO i at year t

V_{it} : media citations of HO i at year t

X_{it} : operational performance of HO i at year t , i.e., ratio of operational cost used to run relief or development operations in the field over the total expenditures

AST_{it} : annual assets of HO i at year t

FRC_{it} : total fundraising costs of HO i at year t

y_{it1}, y_{it2} : dependent variables; logarithm of individual and institutional donations to HO i at year t , i.e., $\log(D_{it}^i), \log(D_{it}^I)$

Table A2 Summary Statistics of Key Variables

Variable	Mean	SD	Min	Max	Observations
<i>log(individual donations)</i>					
Overall	16.68	1.71	10.49	20.53	$N = 200$
Between		1.89	12.44	20.53	$n = 21$
Within		0.55	14.74	18.24	$\bar{T} = 9.52$
<i>log(institutional donations)</i>					
Overall	18.08	2.00	11.78	21.12	$N = 207$
Between		1.97	13.20	20.49	$n = 22$
Within		0.56	15.35	19.76	$\bar{T} = 9.41$
<i>log(media citation)</i>					
Overall	6.57	1.90	1.38	9.82	$N = 265$
Between		1.76	3.03	9.20	$n = 23$
Within		0.75	2.51	9.65	$\bar{T} = 11.52$
<i>Operational performance</i>					
Overall	0.86	0.08	0.37	0.99	$N = 257$
Between		0.06	0.75	0.98	$n = 23$
Within		0.05	0.42	0.99	$\bar{T} = 11.17$
<i>log(annual assets)</i>					
Overall	17.94	1.48	14.36	20.93	$N = 246$
Between		1.53	14.44	20.26	$n = 23$
Within		0.63	15.94	19.24	$\bar{T} = 10.69$
<i>log(fundraising costs)</i>					
Overall	15.43	1.69	9.12	17.77	$N = 218$
Between		1.68	10.77	17.65	$n = 21$
Within		0.58	12.59	16.78	$\bar{T} = 10.38$

Z_{it} : vector of explanatory variables, i.e., $\log(V_{it})$, $\log(V_{it-1})$, X_{it} , X_{it-1}

μ_{i1}, μ_{i2} : HO i 's unobserved time-invariant effects for individual and institutional models

a_1, a_2 : intercepts for individual and institutional models

u_{it1}, u_{it2} : unobserved time-variant errors for individual and institutional models

Appendix B. Model Notation and Proofs

Coordination policy model notation

w : HO's intensity of coordination with one or more other HOs

$X(w)$: HO operational performance in a period; concave function with $X'(0) > 0$

$V(w)$: HO donations received from individuals in a period; concave, decreasing function

$\alpha V(w) + \beta X(w)$: HO donations received from institutions in a period; concave, decreasing function

kX : HO's preference weight on operational performance

k_i : HO's preference weight on individual donations

k_I : HO's preference weight on institutional donations

$\phi v(w)$: components of $V(w)$; ϕ measures sensitivity of $V(w)$ to changes in w

PROOF OF PROPOSITION 1. Statements (i) and (ii) are obvious since w^* is decreasing in the right-hand side of Equation (7). Note that

$$\frac{k_i + \alpha k_I}{k_X + \beta k_I} = \frac{\alpha}{\beta} \left(\frac{k_i/\alpha + k_I}{k_X/\beta + k_I} \right) = \frac{\alpha}{\beta} \left(1 + \frac{k_i/\alpha - k_X/\beta}{k_X/\beta + k_I} \right)$$

which is decreasing in k_I if and only if $k_i/\alpha - k_X/\beta > 0$, or equivalently, $\frac{k_i}{k_X} > \frac{\alpha}{\beta}$. Therefore, w^* is increasing in k_I if and only if $\frac{k_i}{k_X} > \frac{\alpha}{\beta}$. \square

PROOF OF PROPOSITION 2. Since w_i^* satisfies $f(w_i^*) = \frac{k}{k_X}$, w_i^* satisfies $f(w_i^*) = \frac{\alpha k}{k_X + \beta k_I}$ and $f(w)$ decreases in w for all w such that $f(w) \geq 0$, we have $w_i^* < w_i^*$ if and only if $\frac{k}{k_X} > \frac{\alpha k}{k_X + \beta k_I}$, or equivalently, $\frac{1-\alpha}{\beta} > -\frac{k}{k_X}$. \square

PROOF OF PROPOSITION 3. From Equations (7) and (8), the preferred coordination intensity w^* is given by

$$\frac{X'(w)}{-v'(w)} = \frac{\phi(k_i + \alpha k_I)}{k_X + \beta k_I}. \quad (9)$$

The left side is decreasing in w for all w such that $\frac{X'(w)}{-v'(w)} \geq 0$, thus the preferred w^* decreases in the right side of Equation (9). As a result, w^* decreases in ϕ . \square

Notes

¹Although one can easily argue that such uncertainty should instead motivate HOs to coordinate.

²For example, we refer the reader to the annual reports of the International Committee of the Red Cross (ICRC) that indicate even large HOs, such as ICRC, have regular internal meetings to raise media interest and support for their actions.

³In nonprofit sector, the impact of public exposure has been approximated through organizations' fundraising activities. One can categorize these studies into two main streams: (i) the impact of fundraising costs on nonprofit funding (see, e.g., Bose 2015 and Thornton 2006 as empirical, and Toyasaki and Wakolbinger 2014 as analytical studies), and (ii) the fundraising methods through which nonprofits can increase their funding (e.g., Ryzhov et al. 2015). Given that, in many situations, a nonprofit does not have any control on media, we believe that media exposure is different from fundraising activities and, at most, is a subset of fundraising. Therefore, in this study, we separate these two variables and use fundraising cost as a control variable in our econometric model.

⁴For example, ICRC runs many projects in Afghanistan among which one is called "restoring family links" and another is "health care and emergency relief." Both

projects are necessary to alleviate people's suffering while, due to the nature of these projects, each requires a new set of operations and resources (e.g., financial or political resources) and covers a certain number of beneficiaries. While every year ICRC reunites dozens of people with their families, the number of beneficiaries of its health care program is dozens of thousands. Therefore, we cannot simply use indicators like area or population coverage as performance indicators.

⁵An alternative indicator is *giving price* that is calculated by dividing the total donation by the total donation minus the sum of fundraising and administration costs (e.g., Khanna et al. 1995, Posnett and Sandler 1989, Okten and Weisbrod 2000). This is basically the inverse of program spending ratio that is used in this study.

⁶Factiva is a database produced by a joint venture between Reuters and Dow Jones. It combines contents from over 36,000 sources (such as newspapers, journals, magazines, television, and radio transcripts from about 200 countries) and the exclusive combination of The Wall Street Journal, Financial Times, Dow Jones, and Reuters newswires.

⁷For example, for Danish Refugee Council, we ran our search in English, French, Spanish, and Danish.

⁸To make sure that the search result is valid, we set Factiva search to avoid all duplications. We used HO's full name as the search criteria but allow for common abbreviations in combination with humanitarian keywords.

⁹Similar to most of empirical works, this section must be seen under certain limitations. While we spent more than six months to collect and prepare the data for analysis, we wish we could access a larger sample size. Statistical data and relevant information regarding nonprofit organizations has been generally known as being scarce or unavailable (Macedo and Carlos Pinho 2006). This is the reason that most studies related to the nonprofit sector are usually based on very small sample sizes (Hodge and Piccolo 2005). This problem is even more severe in humanitarian sector. For instance, Nunnenkamp and Öhler (2012) highlight that many organizations do not even report their financial statements consistently. While small sample size are generally known to reduce the power of statistical tests (Hodge and Piccolo 2005), result of this study, combined with a conservative estimation method, still shows significant relationships between variables. Moreover, following the literature, we used spending ratio as performance index. While we acknowledge that measuring HO's actual performance is almost impossible, we believe that this measurement may not be the best description of HO's performance. Finally, similar to Macedo and Carlos Pinho (2006) that state "organizations are not isolated entities free from external pressures and acting on their own will," we believe there could be other external factors (e.g., political issues) that might influence HO's donation income in certain years and are not considered in our study. These are undesired, but inherent, limitations of most studies such as this one.

¹⁰Based on Lambert et al. (1999) classification, our study applies to types of coordination for which HOs coordinate their activities to a limited extent in terms of duration, breadth, and strength (i.e., they do not merge). Also,

following Altay and Pal (2014), we consider a broad range of coordination functions within which organizations can coordinate—some of them were exemplified earlier.

¹¹One may view HO operational performance generically as the positive impact on society per dollar of total HO budget, for which the measure of operational performance defined in the empirical section is a proxy.

¹²We note that there may be some organizations for which coordination can positively affect visibility in a way that increases donations. For example, umbrella organizations such as UNHRD provide logistics services to other member HOs, and these organizations may enjoy a positive appeal to donors from coordination. Our analysis does not apply to these types of UN family agencies.

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