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*Media Coverage and Charitable Giving
After the 2004 Tsunami*

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Media Coverage and Charitable Giving After the 2004 Tsunami
Philip H. Brown, Jessica H. Minty
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ABSTRACT

Media coverage of humanitarian crises is widely believed to influence charitable giving, yet this assertion has received little empirical scrutiny. Using Internet donations after the 2004 tsunami as a case study in a tobit framework, we show that media coverage of disasters increases charitable donations, with an additional minute of nightly news coverage increasing donations by 0.036 standard deviations from the mean. We repeat the analysis using instrumental variables in a tobit model to account for endogeneity, and the estimates are unchanged. We also show that the magnitude and sign of media impact vary by news source and relief agency.

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I. INTRODUCTION

It is widely accepted that media coverage of humanitarian crises and donations to relief agencies are directly linked. Indeed, the devastation of New Orleans by Hurricane Katrina on 29 August 2005 dominated news coverage in the weeks and months that followed, and more than two-thirds of Americans donated money to hurricane-related causes (Conference Board, 2006). The presumption that media coverage spurs donations to relief agencies has not yet been subjected to empirical investigation, however.

This study assesses the effect of media coverage on donations to relief agencies in the aftermath of the tsunami associated with the 26 December 2004 Sumatra-Andaman earthquake (hereafter “the tsunami”). This case study is unique in that the tsunami monopolized both the media’s attention and the world’s philanthropic endeavors for well over a month, much longer than previous crises (Wynter, 2005). Therefore, donations to relief agencies during this period largely reflect donor responses to the tsunami itself.

Specifically, we consider the effects of two types of U.S. media coverage – reports on nightly network news broadcasts and articles in major newspapers – on daily donations to eight U.S. relief agencies using a tobit model. To minimize lags between when a news report is seen or read and when a donation is received by the relief agency, we focus on donations made via the Internet, which account for roughly half of the total value of donations made by individuals (El Nasser, 2005). We also control for donor fatigue, tax incentives, and agency-specific effects. Finally, to alleviate potential endogeneity concerns, we use media coverage of the Iraq war and casualties among U.S. military personnel to instrument for media coverage of the tsunami.

We find that an additional minute of network television news coverage increases that day's donations by 0.036 standard deviations from the mean, or 13.2% for the average agency. One additional story in the *New York Times* or the *Wall Street Journal* increases that day's donations by 0.050 standard deviations from the mean, or 18.2% for the average agency. Results are similar using instruments to control for endogeneity bias. Additionally, the marginal effect of media coverage differs considerably by agency, with some agencies seeing donations rise dramatically with additional media coverage, while others see donations hold steady or even decline. Finally, we find considerable evidence for declining donations associated with donor fatigue as well as for the effectiveness of tax incentives in increasing donations.

The remainder of this paper is organized as follows: Section II provides the background and motivation for the analysis; Section III describes the data and variables used; Section IV describes the empirical specification and identification; Section V provides the results of this study; Section VI concludes.

II. BACKGROUND AND MOTIVATION

The motivation for this paper dates to June 1994, when one of the authors was working in a camp for Rwandan refugees in Tanzania. While private donations to relief agencies during the early stages of the Rwandan genocide had been sufficient to support well over one million displaced Rwandans, the tribulations of O.J. Simpson and Tanya Harding soon eclipsed Rwanda in U.S. news, and funding for relief activities began to decline. The

perception among many aid workers was that the public had turned its back on Rwanda, with potentially dire consequences.¹

Numerous studies have analyzed the so-called “CNN Effect” by which media coverage influences the behavior of elected politicians (Robinson, 2002).² Yet, few studies have systematically assessed the relationship between media coverage and the behavior of private donors. A small survey conducted by the Institute for Philanthropy finds that 14 of 15 surveyed British philanthropists believe that the media has the power to encourage private giving (Breeze, 2005). In addition, 11 of the 15 had themselves been inspired by the media to donate to charities. Olsen, Cartenson, and Høyen (2002) compare media coverage and donations for the widespread flooding in Mozambique in 2000 to those of the October 1999 “super” cyclone in eastern India. They find a high correlation between the total number of relevant articles in western newspapers and the total amount of humanitarian assistance for those disasters.

Neither the India cyclone nor the Mozambique flooding captured public attention like the 26 December 2004 Sumatra-Andaman earthquake off the northwest coast of Sumatra. The 9.0-magnitude earthquake triggered a devastating tsunami that spread across the Indian Ocean, inundating coastal communities in Indonesia, Sri Lanka, Somalia, Thailand, the Maldives, and seven other countries. According to UN Statistics, 229,866

¹ Oxfam Canada incorporated this perception in a highly successful advertisement in nationally-circulated newspapers. A large headline shouted, “O.J. SIMPSON LIMITED TO TEN VISITORS A DAY.” Below, in much smaller print, the text read, “In other news: ‘500,000 Rwandan slaughtered. Another half million fighting for lives in refugee camps.’”

² For example, the number of English-language newspaper articles covering HIV/AIDS in Africa increased 437% between 1998 and 2003 (Ross, 2004). During the same period, foreign assistance earmarked by the U.S. for HIV/AIDS research, treatment, and prevention in Africa nearly doubled (Henry J. Kaiser Family Foundation, 2004).

people were either killed or listed as missing (UN Office of the Special Envoy for Tsunami Recovery, 2005). Collectively, this disaster is referred to as the 2004 tsunami, the Asian tsunami, the Indian Ocean tsunami, or the Boxing Day tsunami.

The week following Christmas is often a slow time for news in the U.S. because the legislature is typically in recess and many firms postpone important financial decisions and announcements until the new quarter. As such, the 2004 tsunami had little competition in the news. Moreover, crises that are both unanticipated and understandable often receive more media attention than ongoing and more complex crises (Wynter, 2005), and the 2004 tsunami was both surprising and scientifically explicable. Finally, the unprecedented scope and scale of this natural disaster encouraged an unprecedented media response.

For example, CNN deployed over 80 anchors, correspondents, and producers to provide 24-hour coverage of relief efforts. *ABC's Nightline* dedicated three programs over four days entirely to coverage of the tsunami. Similarly, the tsunami dominated the front page of the *New York Times*, garnering over half of the articles on the front page in the week following the disaster. *Time*, *Newsweek*, *U.S. News and World Report*, *The Economist*, and numerous other news magazines featured the tsunami and recovery efforts in multiple cover stories. Indeed, the tsunami dominated worldwide media attention well into January, 2005, much longer than any natural disaster in modern history (Wynter, 2005). The tsunami also captured the imagination of amateur reporters: 3.5% of all Internet blogs referenced the tsunami in the last six days of 2004 (Nielson BuzzMetrics, 2005).

Private donations to relief agencies were equally unprecedented. For example, Catholic Relief Services reported that it raised more than \$1 million in under three days, a

record for the group (Slavin, 2004). Similarly, while Save the Children USA typically receives several hundred thousand dollars in the month following a disaster, the agency received \$6 million in donations in the first four days following the tsunami (Strom, 2005). Lutheran World Relief raised more money in one week than it typically does in one year (Cooperman and Salmon, 2005). Indeed, an Associated Press poll revealed that 30% of American households had donated to the relief efforts within two weeks of the disaster (El Nasser, 2005). As a result, U.S. charities had received more than \$337 million in donations by January 8, with the American Red Cross alone raising more than \$150 million (Cooperman and Salmon, 2005).

At least five phenomena may have facilitated these record contributions. First, the crisis fell at a time of year when many people celebrate holidays that emphasize compassion and giving. Second, the beaches of Southeast Asia are familiar to American tourists who have visited in increasing numbers in recent decades (Hall and Page, 2000). Third, tax incentives have been shown to motivate charitable giving,³ and the tsunami occurred just five days before the traditional deadline for 2004 tax deductions. In addition, the Tsunami Disaster Aid Tax Relief Act extended this deadline for charitable contributions until January 31. Fourth, technology facilitated giving, with approximately half of all donations made online (El Nasser, 2005). For example, Internet sites such as Google and Amazon.com added links to charities on their own websites⁴, and 1% of U.K. donors donated to tsunami

³ For example, a survey published by the Chronicle of Philanthropy shows that 54% of the wealthiest U.S. donors cite tax benefits as a major motivation for giving (Breeze, 2005).

⁴ Amazon.com raised \$2.5 million for the American Red Cross in the first 24 hours that the link was live. (Slavin, 2004)

relief via text messaging on cell phones (Eldridge, 2005). Finally, the extraordinary treatment of the disaster by the media may have prompted the extraordinary donations by Americans.

Regardless, trends in donations closely track trends in media coverage of the tsunami, suggesting that the media strongly influences private giving to relief agencies. Media coverage reaches a crescendo on 30 December and donations to relief agencies peak one day later (Figure 1). A second peak in media coverage occurs on 4 January (nine days after the tsunami) following two minor aftershocks and Secretary of State Colin Powell's visit to the affected region (Figure 2⁵); donations remain high through this period, and both media coverage and donations fall slowly thereafter. A second spike in donations occurs on 31 January (36 days after the tsunami), when 2004 tax deductions for donations to tsunami donations expire. Subsequent peaks in media coverage include: 1 February, when President Bill Clinton is named special envoy to South Asia and when the custody battle over "Baby 81" begins; 19 February, when President George H.W. Bush joins Clinton in touring affected countries; 24 February, the release date of photographs of the tsunami taken by Canadian vacationers who subsequently drowned; 8 March, when Clinton and Bush brief President George W. Bush on their findings; 26 March – the three month anniversary of the tsunami, when the media spotlights recovery and reconstruction; and 28 March, when a magnitude 8.7 earthquake occurs close to the epicenter of the December 2004 Sumatra-Andaman earthquake.

⁵ Note that the scales in the two figures are different to better highlight small changes after 21 days.

III. DATA AND VARIABLES

In analyzing the relationship between media coverage of the 2004 tsunami and donations to relief agencies, this study employs daily donations made via agencies' websites. Focusing on online giving minimizes the lag between when a donor observes a news item and when his or her donation is recorded by the recipient agency. In addition, online donations accounted for approximately half of all donations for tsunami relief (El Nasser, 2005).

Three dozen U.S. charities that provided relief to tsunami victims were asked to share their daily receipts from Internet sources for the purpose of this research. Eight agreed to participate in this study, including Catholic Relief Services, Mercy Corps, SurfAid International, and five others who asked to remain anonymous. Five of the eight relief agencies included in the study are among the Chronicle of Philanthropy's "Philanthropy 400," the nation's largest nonprofit groups by private funding (Chronicle of Philanthropy, 2005). Two are among the ten largest charitable organizations on the list and three have religious affiliations. All eight organizations receive donations from across the U.S.

Summary statistics for donations during the 100 days following the tsunami are presented in Table 1. For each agency, the mean value of donations per day is \$72,583. The value of donations varies considerably, however, reflected by the standard deviation of \$265,802; the smallest organization (Agency 1) averages \$172 per day in donations while the largest (Agency 8) averages \$175,339. Four agencies receive over \$100,000 on average each day, but only three of the agencies received donations every day during this period. One agency received gifts in excess of \$3,000,000 on 31 December 2004.

Given the time frame of the study, most agencies record donations each day between 26 December 2004 and 5 April 2005. However, Agencies 4 and 8 do not report Internet donations made on weekends. Agency 7 was not equipped to receive web donations until 21 January, reducing the number of observations to 71 for that agency. Finally, Agency 5 is missing three days of observations because Internet donations overwhelmed their system, crashing the server. We thus record 714 observations for donations over the period.

In this analysis, media coverage is first measured by the number of minutes of tsunami-related reporting on each of the three largest evening news broadcasts as recorded by the Television News Archive at Vanderbilt University. According to the Pew Center for the People and the Press (2004), 34% of Americans regularly watch the nightly news on one of the three major broadcast networks, making the nightly news among the most common sources for information. The mean number of minutes of tsunami coverage per broadcast of *ABC World News Tonight*, the *CBS Evening News*, and *NBC Nightly News* are 1.88, 1.52, and 2.23 minutes, respectively, representing a significant proportion of the 28.5 minute broadcasts (which typically also include between eight and nine minutes of commercials). The standard deviations of these broadcasts are 4.02, 3.17, and 4.11 minutes, respectively, indicating that coverage varies considerably over the study period. Tsunami coverage within each broadcast is similar for all three programs, with simple correlations of between 0.66 (ABC and CBS) and 0.83 (CBS and NBC). ABC allocated its entire broadcast to the tsunami on 2 January. For CBS, coverage peaked at 12.7 minutes on January 1. For NBC, coverage peaked at 14.8 minutes on January 8. On each of these days, more than half the

program was devoted to tsunami coverage. Both ABC and CBS occasionally preempted nightly news broadcasts for sports events, but NBC aired its program every day.

Media coverage is also measured by tsunami-related articles published in major newspapers, of which 42% of Americans report being regular readers (Pew Center for the People and the Press, 2004). Specifically, we consider the word counts of articles appearing in the *New York Times* and the *Wall Street Journal*, two of the largest U.S. newspapers by both circulation and subscription (Newspaper Association of America, 2006). These data are publicly available from the Lexis Nexis and Proquest Newspaper indexes. Word counts in articles pertaining to the tsunami closely mirror time allocated to the tsunami in nightly news broadcasts (Figure 3).

The *New York Times* averaged 1,792 words in articles pertaining to the tsunami during the study period, approximately 2.6 articles of average length. The *Wall Street Journal* averaged 2,342 words per day, or 3.3 articles of average length. Word counts of tsunami coverage in the *New York Times* are highly correlated with those in the *Wall Street Journal*, with a simple correlation of 0.82, suggesting that the papers were similarly focused on the disaster during this period. The *New York Times* is published daily while the *Wall Street Journal* is not published on weekends or holidays. As such, there are fewer observations for the *Wall Street Journal* than for the *New York Times*.

IV. EMPIRICAL SPECIFICATION AND IDENTIFICATION

This paper assesses the causal effect of daily media coverage of the 2004 tsunami on donations to eight U.S.-based relief agencies. Because Internet donations are made and recorded on the same date, using this measure precisely captures the time of giving. If, instead, total donations from all sources were included, it would not be possible to discern the timing of the gift and hence the impact of media coverage.

The date on which donations are made also influences daily totals because giving typically peaks immediately following a major disaster, receding gradually over the weeks that follow (Wynter, 2005). This phenomenon is known as “donor fatigue,” a state in which donors have already exhausted their resources or in which they grow complacent about appeals for charitable gifts, leading to a diminished public response. The gradual decline in donations is seen clearly in Figure 2. Tax incentives may also affect daily donations independent of media coverage (Greene and McClelland, 2001) as evidenced by the two spikes in charitable giving on 31 December 2004 and 31 January 2005 (Figures 1 and 2).

As noted above, the eight agencies represent the broad spectrum of non-profit organizations offering assistance to tsunami victims, and their daily receipts vary considerably. To account for this variation and to make comparisons across agencies possible, we calculate z-scores for each agency’s collections on each day; the z-score is defined as the number of standard deviations from the mean across the period of study.

Furthermore, five of the eight agencies included in the study received no donations on at least one day during the study period. Indeed, 118 of the observed 714 daily Internet donations for a given relief agency are zero, suggesting the existence of a corner solution

response. Because of censoring at zero, ordinary least squares is an inconsistent estimator. To circumvent this problem, the causal effect of media coverage on donations is estimated via a tobit model:

$$DON_{i,t} = \max(0, \beta_1 MEDIA_t + \mathbf{X}_{i,t} \beta_2 + u_{i,t}) \quad (1)$$

where $DON_{i,t}$ is Internet donations received by agency i on day t . $MEDIA_t$ is the media coverage of the tsunami and recovery efforts on day t , measured either as nightly news reporting on the three largest networks or as word counts in the *New York Times* and the *Wall Street Journal*. \mathbf{X} is a vector that includes the number of days after the tsunami struck in log form to account for donor fatigue, a dummy for 31 January to account for tax incentives associated with charitable contributions for tsunami relief, and a series of dummies for each relief agency. The error term is assumed to follow a normal distribution: $u \sim N(0, \sigma^2)$.

Measurement error, simultaneity, and omitted variables each potentially bias the estimated effect of media coverage on donations. However, measurement error in media coverage is unlikely as the electronic databases maintain precise figures on the timing of news broadcasts and the word counts of newspaper articles. Any measurement error that does exist is unlikely to be systematic, leading simply to attenuation bias. Simultaneity bias may be more problematic, however. For example, approximately 2.1% of the tsunami-related articles published in the *Wall Street Journal* and 1.4% of those published in the *New York Times* focused on the magnitude and form of the response by private donors, suggesting reverse causality in a small number of cases.

Omitted variable bias is also potentially problematic. First, other media coverage of the tsunami is likely to influence giving; such coverage may include articles in other newspapers and news broadcasts on other networks, special reports, television talk shows, news magazines and other periodicals, Internet news, and radio news. Second, several of the relief agencies included in this study solicited donations for tsunami victims via advertising and direct mail campaigns. Third, the efforts of some relief agencies were noted in the media, often including instructions for donating (see, for example, Strom 2004). Each of these may result in increased Internet donations, leading to upward-biased estimates of the estimated effect of television and newspaper coverage.

Fortunately, biases induced by measurement error, simultaneity, and omitted variables may be addressed using instrumental variables in a tobit framework. Appropriate instrumental variables are exogenous determinants of daily media coverage of the tsunami that do not correlate with the error term in Equation 1. Dramatic news has been shown to crowd out reporting on disasters (Eldridge, 2005), so developments in the Iraq war may influence media coverage of the tsunami. Two different instrumental variables are thus separately employed in this analysis – media coverage of the Iraq war and the number of casualties among U.S. military personnel each day in Iraq. Both are plausibly exogenous to donations to relief agencies as none of the eight agencies worked in Iraq during the period of study. Daily media coverage of the Iraq war is measured by total word counts in the *New York Times* and *Wall Street Journal* for newspaper coverage and by minutes on the three nightly news broadcasts for television coverage. Information on U.S. military casualties in Iraq is based on U.S. Department of Defense statistics.

A final endogeneity concern arises if the eight relief agencies included in the study are not representative of agencies involved in tsunami relief more generally. If compiling daily records of Internet donations is costly, for example, then the eight agencies that provided data are likely to be either large enough to dedicate staff time to data collection or to be efficient enough that data collection is not costly. Given that the eight agencies differ by size, focus, religious affiliation, and other characteristics and that virtually all relief agencies track Internet giving electronically, we find either explanation unlikely. In addition, virtually all of the agencies that worked in the affected areas accepted online donations and all eight organizations fall under the purview of the United Nations Office for the Coordination of Humanitarian Affairs. Nevertheless, we cannot rule out the possibility that the eight agencies included in the study are not fully representative of all relief agencies.

V. RESULTS

Table 2 describes the effect of nightly news coverage of the December 2004 tsunami by the major broadcast networks on private donations to eight relief agencies in the 100 days immediately following the tsunami using tobit estimation. The tobit model accounts for the 118 observations in which daily donations are censored at 0. The dependent variable is the z-score of donations to facilitate comparisons across agencies; coefficients are thus interpreted in terms of standard deviations from the mean donation of \$72,583.3 during the study period. Columns 2 through 4 report the effect of additional time allocated to coverage of the disaster on *ABC World News Tonight*, the *CBS Evening News*, and *NBC*

Nightly News, respectively, measured by minutes. Column 1 aggregates the three broadcasts into a total number of minutes. Heteroskedasticity-robust standard errors are reported.

Both media coverage and the response of individual donors to relief agencies decay as days, weeks, and months pass, as the images become less shocking, and as individual givers experience donor fatigue. To account for these nonlinear time trends, the log of days since the tsunami struck is included as an additional regressor. In each of the four specifications, the estimated coefficient is negative and significantly different from zero at the 1% significance level. Total donations to the eight agencies on the tenth day after the tsunami are predicted to fall by 0.037 standard deviations from the mean (13.5%) from those received on the ninth day,⁶ while donations on the fiftieth day are predicted to fall by 0.008 standard deviations (2.9%) from those received on the forty-ninth day. The extended tax deadline also produced a dramatic – if very short – spike in donations (Figure 2). Results show that donations rose by approximately 0.60 standard deviations from the mean (219.7%) during the last day of January 2005, an effect that is significant at the 1% level.

Agency 1 received fewer donations via the Internet than any of the other relief agencies included in the study. Although Agency 8 is smaller than many of the other agencies, it receives a high share of its private donations via the Internet, a fact that is reflected in the large coefficient on that dummy variable. Agencies 2, 3, 5, 6, and 7 receive significantly larger Internet donations than Agency 1.

One additional minute of total news coverage increases donations by 0.036 standard deviations from the mean, raising the average daily private donation by 12.8%, significant at

⁶ $-0.351 \times (\ln 10 - \ln 9) = -0.0369$

the 1% level. An additional minute of relevant coverage on *ABC World News Tonight* increases donations by 0.084 standard deviations, or 30.8%. An additional minute of coverage on the *CBS Evening News* or *NBC Nightly News* increases donations by 0.060 standard deviations (22.0%) and by 0.065 standard deviations (23.8%), respectively. All of these estimated coefficients are larger than those for total nightly news coverage, although this reflects the very high correlation of minutes allocated to tsunami coverage among the three largest networks.

Table 3 shows the effect of daily newspaper coverage of the 2004 tsunami on private donations to relief agencies, also using tobit analysis. Columns 2 and 3 report the effect of additional articles in the *New York Times* and the *Wall Street Journal*, respectively, measured in 100-word units. The smaller sample size for *Wall Street Journal* articles reflects the fact that this newspaper is not published on weekends or holidays. The total number of words in tsunami-related stories from the two sources is added together in Column 1.

Increasing relevant coverage by 100 words in the *New York Times* raises donations to relief agencies by 0.010 standard deviations from the mean, or 3.5%. An additional 100 words in the *Wall Street Journal* raise donations by 0.140 standard deviations, or 5.0%. As with television news coverage, the estimated effect of total word counts is smaller than that of either the *New York Times* or the *Wall Street Journal* alone, reflecting the fact that coverage among print media are highly correlated. One hundred additional total words increase donations to relief agencies by 0.007 standard deviations from the mean, or 2.6%. An additional story of 700 words (an average number among major dailies) raises donations by 18.2%. These results are all significant at the 1% level. In addition, the effects of

passing time and the tax extension are very similar to the estimated coefficients calculated when assessing the impact of television coverage.

While the above results are robust across specifications, endogeneity concerns remain. As noted in Section IV, both simultaneity and omitted variable bias may be problematic. For example, approximately 2% of the articles related to the tsunami published by the newspaper under consideration focused on the response by private donors, suggesting the existence of reverse causality. In terms of omitted variable bias, other media coverage of the disaster (including cable television news, additional newspapers, Internet news coverage, and other media) may also influence donations. Similarly, some relief agencies purchased advertising and/or undertook direct mail campaigns during this period, while others were mentioned in the media specifically for their assistance to tsunami victims. Each of these occurrences may result in increased Internet donations, leading to upward-biased estimates of our measures of media coverage. Fortunately, these problems may be addressed using instrumental variables.

Two different instrumental variables are separately employed in this analysis – daily media coverage of the Iraq war and the daily number of casualties among U.S. military personnel in Iraq in the 100 days following the tsunami disaster. These instruments are strong predictors of daily television news coverage of the tsunami disaster as indicated by the first stage tobit results presented in Table 4. They are also plausibly exogenous to tsunami-related donations. Regressing total time dedicated to the tsunami on time dedicated to the Iraq war while controlling for all of the other regressors in Equation 1 yields a robust z -statistic of 19.10 (Column 1), easily meeting the criteria for strong

instrumental variables (Bound, Jaeger, and Baker, 1995; Murray, 2005; Stock and Yogo, 2005). The number of casualties among U.S. military personnel is also strong (albeit considerably weaker than the previous instrument), with a robust z-statistic of 6.12 (Column 2). Finally, although both media coverage of the Iraq war and the number of U.S. military casualties in Iraq influence newspaper coverage of the tsunami disaster, neither is sufficiently strong in the first stage to yield unbiased estimates in the second stage, possibly because newspapers are less constrained in the number of stories covered on any given day than is broadcast news. Thus, the estimates which include instrumental variables will focus only television coverage of the tsunami.

Table 5 describes the effect of television coverage of the tsunami disaster on private donations to relief agencies using IV tobit estimation to control for any extant simultaneity and omitted variable bias. As above, private donations to relief agencies are expressed in terms of z-scores and heteroskedasticity-robust standard errors are reported. Column 1 presents results that employ daily television coverage of the Iraq war as the instrument and Column 2 presents results that use the number of U.S. military casualties in Iraq by day as the instrument. The estimated effect of nightly news coverage is essentially unchanged from the tobit results without instrumentation presented in Table 1: an additional minute of television news coverage raises donations to relief agencies by between 0.036 and 0.038 standard deviations from the mean, or between 13.2% and 13.9%. The estimates are significant at the 10% level when using U.S. military casualties in Iraq as the instrument and at the 1% level when using television coverage of the Iraq war as an instrument. These

results suggest that neither simultaneity bias nor omitted variable bias is a serious problem, and the subsequent results do not include instrumentation.

Finally, Table 6 includes media-agency interaction terms to determine whether the marginal effect of media coverage differs for each relief agency using tobits. Again, private donations to relief agencies are expressed in terms of z-scores and heteroskedasticity-robust standard errors are reported. The estimated effect of television news coverage is not statistically different from zero for either Agency 1 or Agency 6 (Column 1), suggesting that variation in television coverage does not have any discernable effect on donations received during the study period. By contrast, an additional minute of broadcast news coverage increases donations to Agency 2 by 0.056 standard deviations ($P > \chi^2 = 0.001$), to Agency 3 by 0.082 standard deviations ($P > \chi^2 = 0.000$), to Agency 5 by 0.084 standard deviations ($P > \chi^2 = 0.000$), to Agency 7 by 0.009 standard deviations ($P > \chi^2 = 0.038$), and to Agency 8 by 0.048 standard deviations ($P > \chi^2 = 0.083$). Notably, additional television news *reduces* donations to Agency 4 by 0.012 standard deviations ($P > \chi^2 = 0.089$), suggesting that charitable giving may become more concentrated during the tsunami. This may occur, for example, if television coverage induces donors who have given to Agency 4 previously to donate to another agency instead.

Similar results are found for newspaper coverage (Column 2). The marginal effect of additional coverage of the tsunami in the *New York Times* and the *Wall Street Journal* are to increase donations to Agency 2 by 0.010 standard deviations ($P > \chi^2 = 0.010$), to Agency 3 by 0.015 standard deviations ($P > \chi^2 = 0.000$), to Agency 5 by 0.015 standard deviations ($P > \chi^2 = 0.008$), and Agency 8 by 0.011 standard deviations ($P > \chi^2 = 0.098$). The marginal effect of

media coverage on donations to Agencies 1 and 6 is again statistically indistinguishable from zero, as is the effect of media coverage on donations to Agency 4. Interestingly, newspaper coverage of the tsunami has the opposite effect of television coverage for Agency 7, with an additional 100 words reducing estimated donations by 0.003 standard deviations ($P > \chi^2 = 0.053$), suggesting that the source of information is also important for some relief agencies.

Together, these results show that both television and newspaper coverage of the 2004 tsunami had a positive and significant effect on Internet donations to relief agencies. However, the effect varies greatly by agency, and media coverage can lead to lower donations in some cases.

VI. CONCLUSION

This paper empirically investigates the relationship between media coverage of humanitarian crises and private donations to relief agencies. The 2004 tsunami provides an excellent case study because it prompted unprecedented media coverage, unprecedented charitable giving, and a great deal of speculation about the relationship between the two.

We assess the effects of tsunami-related reporting on *ABC World News Tonight*, the *CBS Evening News*, and *NBC Nightly News* and tsunami-related articles in the *New York Times* and the *Wall Street Journal* on donations to eight relief agencies. Because Internet donations played an important role in facilitating giving after the tsunami and because Internet donations are more likely to reflect contemporaneous media coverage of the disaster, we exclude other forms of giving in the analysis. We also control for donor fatigue via a variable measuring the number of days since the tsunami struck, for tax incentives via a

dummy indicating the last day that donations were eligible for 2004 deductions, and for agency-specific effects.

We find that an additional minute allocated to tsunami coverage on the evening news increases that day's donations by 0.036 standard deviations from the mean, or 13.2% for the average agency. Similarly, 100 additional words allocated to tsunami coverage in major newspapers increase that day's donations by 0.007 standard deviations from the mean, or 2.6% for the average agency; a typical 700-word article thus raises donations by 18.2% on average.

Simultaneity concerns may arise due to media coverage of donors' unparalleled generosity. Similarly, omitted variables such as news coverage of the tsunami in other media sources and advertising campaigns undertaken by relief agencies may bias the estimated effect of media coverage upward. To account for this possibility, we employ two different instrumental variables – media coverage of the Iraq war and U.S. military casualties in Iraq. These instruments are strong predictors of television news coverage while remaining plausibly exogenous to donations to relief agencies, yet instrumenting for media coverage of the tsunami does not appreciably affect the point estimates.

Next, we find that the marginal effect of media coverage differs considerably among the eight agencies. Perhaps not surprisingly, media coverage results in significantly more donations for several of the relief agencies included in the study. For one agency, an additional minute of tsunami coverage on the evening news increases donations by 0.084 standard deviations while 100 additional words of tsunami coverage in newspaper articles increases donations by 0.015 standard deviations. By contrast, one agency did not see any

impact of news coverage on its Internet donations. Also, television coverage increased donations while newspaper coverage decreased donations for another agency, suggesting that the form of media coverage may also impact Internet donations for some charitable organizations.

Finally, we find that donations decay over time, even controlling for media coverage of the tsunami, providing evidence of donor fatigue. However, the Tsunami Disaster Aid Tax Relief Act, which extended tax deductions for tax year 2004 until 31 January 2005 for tsunami-related charitable contributions, prolonged high levels of giving and contributed to record giving. This result provides evidence that tax policy complements media coverage in inducing donations to charities.

These results clearly demonstrate the causal impact of media coverage of humanitarian crises on charitable giving. From the perspective of most relief agencies, this conclusion suggests that encouraging media to keep humanitarian crises in the news is in their best interest. Media-savvy relief agencies have certainly done so by making themselves available for updates long after disasters struck. In the case of the tsunami, relief workers from Oxfam provided commentary on all three network evening news broadcasts at the end of March 2005. Similarly, reconstruction efforts undertaken by Catholic Relief Services in Banda Aceh were featured in a three-minute segment on *NBC Nightly News* a year after the tsunami struck. Indeed, some humanitarian agencies even create news, as did the International Rescue Committee in awarding its Freedom Award to Presidents Bush and Clinton for their efforts on behalf of tsunami victims; reported by the Associated Press and highlighted by CNN, this pushed the tsunami back into the news in mid-November 2005.

Other agencies may follow these examples, perhaps relying on non-profit advocacy groups such as *Media 4 Humanity* for assistance in working with news outlets.

It is our hope that the television and newspaper media will also recognize this relationship and that the beneficiaries of relief agencies' efforts will enter into their calculus when deciding what news to present. In this way, celebrity trials and movie star divorces may not push disasters out of the media spotlight, as happened by the middle of March 2004.

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FIGURE 1
Donations and Television Coverage from Day 0 to Day 21

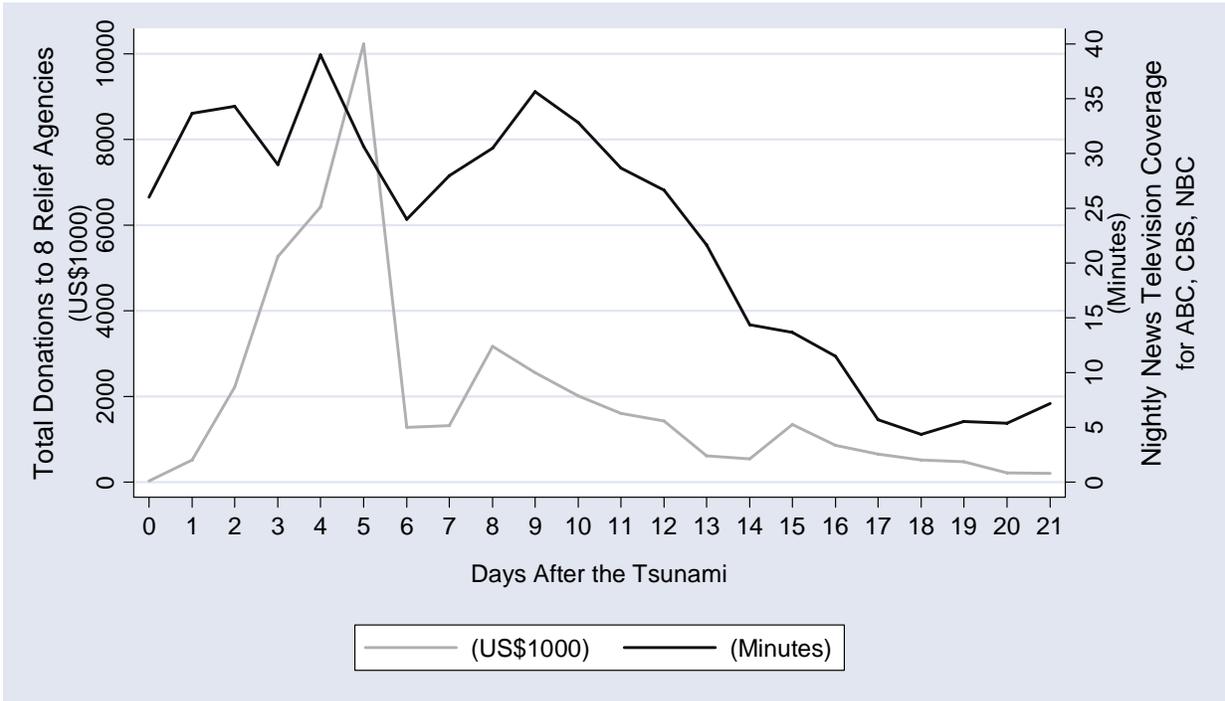


FIGURE 2
Donations and Television Coverage from Day 21 to Day 100

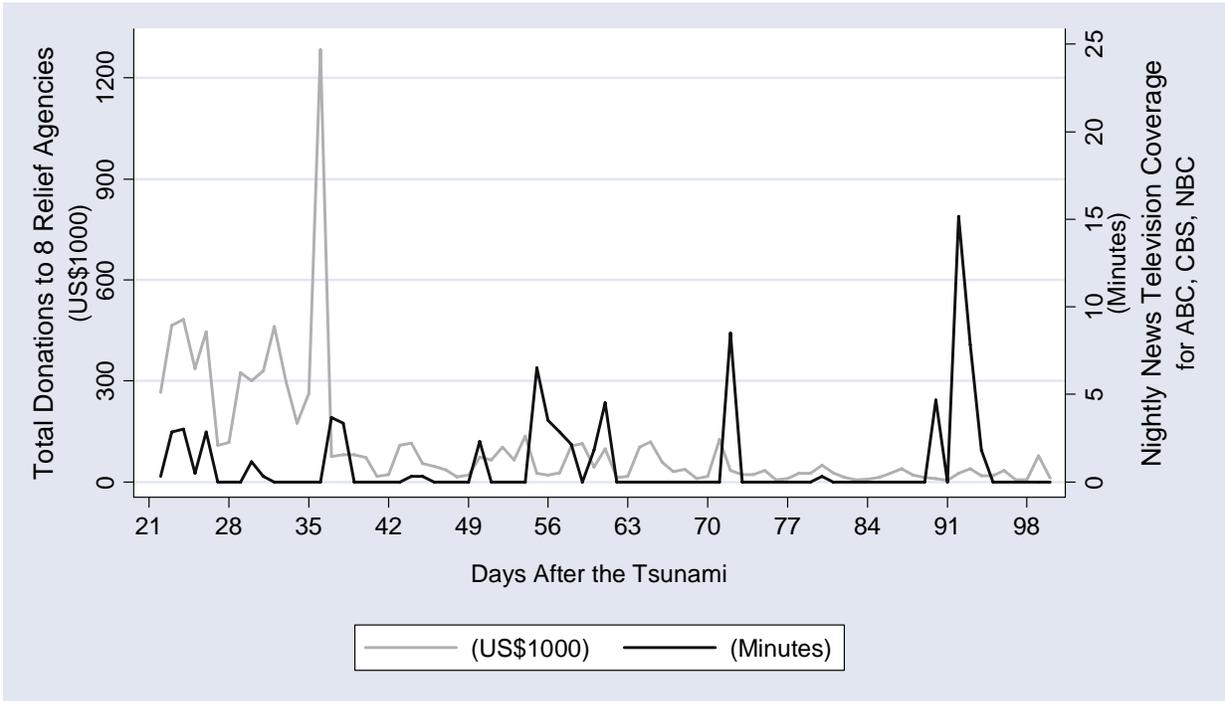


FIGURE 3
Newspaper and Television Coverage from Day 0 to Day 100

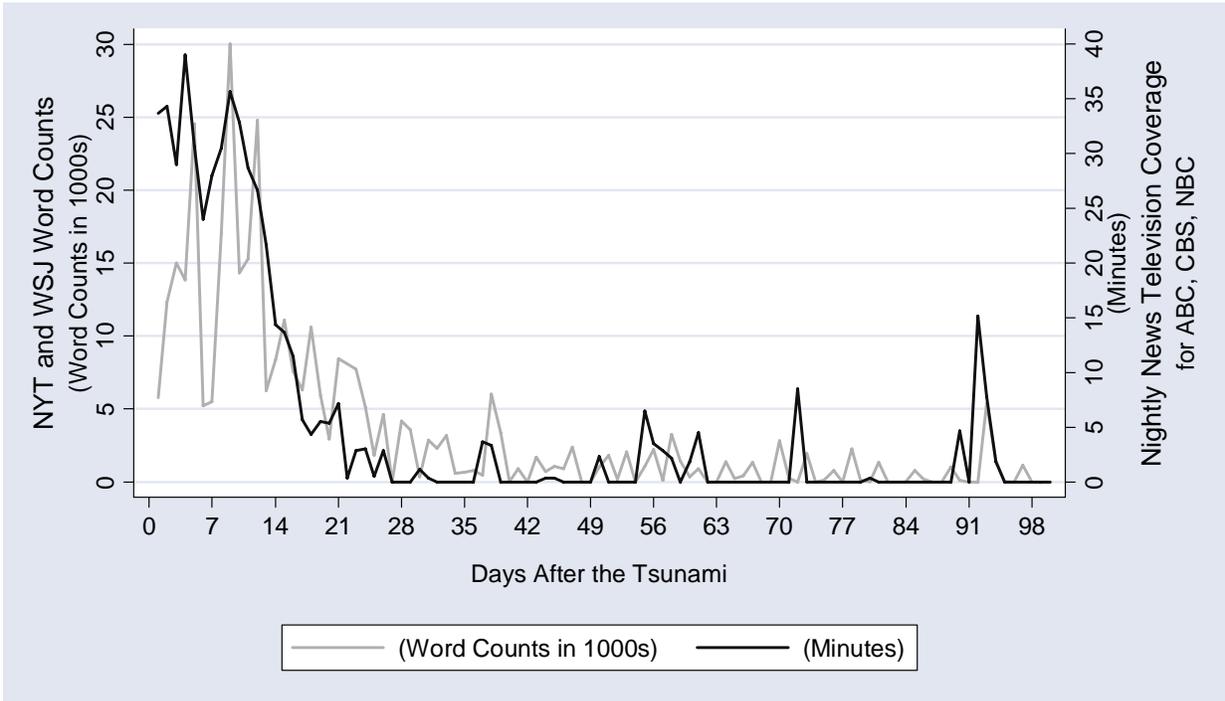


TABLE 1
Summary Statistics

| Variable | Unit | Obs. | Mean | Std. Dev. | Min. | Max. |
|-----------------------|------|------|--------------|--------------|------------|----------------|
| Total Internet | | | | | | |
| Donations | # | 714 | \$72,583.30 | \$265,802.00 | \$0.00 | \$3,145,853.00 |
| Donations to Agency 1 | # | 101 | \$171.60 | \$556.96 | \$0.00 | \$5,000.00 |
| Donations to Agency 2 | # | 101 | \$106,561.60 | \$287,211.00 | \$1,143.00 | \$1,968,930.00 |
| Donations to Agency 3 | # | 101 | \$126,914.90 | \$357,153.40 | \$0.00 | \$2,004,113.00 |
| Donations to Agency 4 | # | 71 | \$3,515.61 | \$12,530.91 | \$0.00 | \$98,346.22 |
| Donations to Agency 5 | # | 98 | \$135,070.50 | \$389,883.50 | \$1,773.00 | \$2,896,813.00 |
| Donations to Agency 6 | # | 101 | \$23,735.52 | \$59,864.76 | \$0.00 | \$392,857.60 |
| Donations to Agency 7 | # | 71 | \$964.16 | \$1,660.80 | \$0.00 | \$9,560.00 |
| Donations to Agency 8 | # | 70 | \$175,339.40 | \$403,689.70 | \$1,670.00 | \$3,145,853.00 |
| ABC Daily Minutes | # | 101 | 1.88 | 4.02 | 0.00 | 18.00 |
| CBS Daily Minutes | # | 101 | 1.52 | 3.17 | 0.00 | 12.67 |
| NBC Daily Minutes | # | 101 | 2.23 | 4.11 | 0.00 | 14.83 |
| Total Daily TV | | | | | | |
| Minutes | # | 101 | 5.63 | 10.42 | 0.00 | 39.00 |
| NYT Daily Word | | | | | | |
| Count | # | 101 | 1,791.85 | 2,745.96 | 0.00 | 15,132.00 |
| WSJ Daily Word | | | | | | |
| Count | # | 73 | 2,356.27 | 3,644.75 | 0.00 | 14,888.00 |
| Total Daily Word | | | | | | |
| Count | # | 101 | 3,494.90 | 5,642.75 | 0.00 | 30,020.00 |

TABLE 2
Effect of Nightly News Coverage on Donations to Relief Agencies (z-scores)
(Tobit)

| | (1) Total | (2) ABC | (3) CBS | (4) NBC |
|------------------------------------|---------------------|---------------------|---------------------|---------------------|
| Coverage on Nightly News (Minutes) | 0.035*** (5.32) | 0.084*** (4.81) | 0.060*** (3.49) | 0.065*** (4.76) |
| Log Days After | -0.351*** (4.15) | -0.412*** (5.03) | -0.531*** (5.62) | -0.450*** (4.81) |
| Dummy for 31 January | 0.659*** (3.05) | 0.616*** (2.87) | 0.555*** (2.58) | 0.601*** (2.82) |
| Agency 2 | 1.143*** (6.56) | 1.140*** (6.54) | 1.167*** (6.64) | 1.161*** (6.58) |
| Agency 3 | 1.106*** (6.00) | 1.103*** (6.01) | 1.122*** (6.00) | 1.118*** (5.98) |
| Agency 4 | 0.210 (1.38) | 0.198 (1.30) | 0.210 (1.45) | 0.235 (1.60) |
| Agency 5 | 1.266*** (5.84) | 1.264*** (5.84) | 1.293*** (5.86) | 1.285*** (5.85) |
| Agency 6 | 0.778*** (5.17) | 0.775*** (5.13) | 0.800*** (5.38) | 0.794*** (5.30) |
| Agency 7 | 1.024*** (5.84) | 1.011*** (5.80) | 1.039*** (5.91) | 1.041*** (5.90) |
| Agency 8 | 1.360*** (5.45) | 1.351*** (5.41) | 1.383*** (5.53) | 1.396*** (5.54) |
| Constant | 0.027 (0.09) | 0.296 (1.12) | 0.761** (2.55) | 0.423 (1.39) |
| Observations | 709 | 709 | 709 | 709 |
| Censored Observations | 118 | | | |

NOTE: Absolute value of robust z-statistics in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 3
Effect of Newspaper Coverage on Donations to Relief Agencies (z-scores)
(Tobit)

| | (1) Total | (2) NYT | (3) WSJ |
|----------------------------------|---------------------|---------------------|---------------------|
| Newspaper Word Count (100 Words) | 0.0071*** (3.61) | 0.0096*** (3.05) | 0.0138*** (3.71) |
| Log Days After | -0.353*** (4.11) | -0.493*** (5.30) | -0.321*** (3.06) |
| Dummy for 31 January | 0.674*** (3.00) | 0.565*** (2.62) | 0.773*** (3.23) |
| Agency 2 | 1.166*** (6.81) | 1.184*** (6.73) | 1.331*** (6.48) |
| Agency 3 | 1.126*** (6.12) | 1.137*** (6.06) | 1.327*** (5.84) |
| Agency 4 | 0.183 (1.21) | 0.236* (1.65) | 0.285 (1.62) |
| Agency 5 | 1.281*** (6.08) | 1.302*** (6.00) | 1.453*** (5.64) |
| Agency 6 | 0.802*** (5.40) | 0.817*** (5.48) | 0.889*** (4.99) |
| Agency 7 | 1.064*** (6.05) | 1.081*** (6.00) | 1.210*** (5.80) |
| Agency 8 | 1.359*** (5.82) | 1.420*** (5.76) | 1.496*** (5.78) |
| Constant | -0.045 (0.12) | 0.522 (1.51) | -0.336 (0.73) |
| Observations | 709 | 709 | 554 |
| Censored Observations | 118 | | |

NOTE: Absolute value of robust z-statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 4
 Effect of Iraq News Coverage and U.S. Military Casualties
 on Tsunami Coverage During Evening News Broadcasts
 (First Stage of IV Tobit)

| | (1) Iraq News Coverage | (2) US Military Casualties |
|------------------------------------|------------------------------|----------------------------------|
| Coverage on Nightly News (Minutes) | -0.286*** (19.10) | -0.191*** (6.12) |
| Log Days After | -9.302*** (34.22) | -9.264*** (31.82) |
| Dummy for 31 January | 2.396*** (5.27) | -5.682*** (22.77) |
| Agency 2 | 0.000 (0.00) | 0.000 (0.00) |
| Agency 3 | 0.000 (0.00) | 0.000 (0.00) |
| Agency 4 | 0.340 (0.40) | 0.391 (0.43) |
| Agency 5 | 0.091 (0.12) | 0.083 (0.10) |
| Agency 6 | 0.000 (0.00) | 0.000 (0.00) |
| Agency 7 | -0.350 (0.50) | -0.524 (0.70) |
| Agency 8 | 0.340 (0.40) | 0.391 (0.43) |
| Constant | 41.643*** (34.01) | 39.597*** (30.75) |
| Observations | 800 | 800 |
| Censored Observations | 440 | |

NOTE: Absolute value of robust z-statistics in parentheses
 * significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 5
 Effect of Television Coverage on Donations to Relief Agencies (z-scores)
 with Instrumental Variables
 (Second Stage of IV Tobit)

| | (1) Iraq News Coverage | (2) US Military Casualties |
|------------------------------------|------------------------------|----------------------------------|
| Coverage on Nightly News (Minutes) | 0.038*** (3.32) | 0.036* (1.65) |
| Log Days After | -0.311*** (4.75) | -0.333* (1.95) |
| Dummy for 31 January | 0.646*** (2.94) | 0.632*** (2.58) |
| Agency 2 | 1.035*** (6.04) | 1.035*** (6.02) |
| Agency 3 | 1.031*** (5.68) | 1.032*** (5.67) |
| Agency 4 | 0.186 (1.25) | 0.186 (1.27) |
| Agency 5 | 1.158*** (5.42) | 1.158*** 5.40 |
| Agency 6 | 0.681*** (4.61) | 0.681*** 4.61 |
| Agency 7 | 0.916*** (5.26) | 0.915*** 5.21 |
| Agency 8 | 1.251*** (5.12) | 1.253*** 5.11 |
| Constant | -0.024 (0.08) | 0.069 (0.09) |
| Observations | 709 | 709 |
| Censored Observations | 118 | |

NOTE: Absolute value of robust z-statistics in parentheses
 * significant at 10%; ** significant at 5%; *** significant at 1%

TABLE 6
Effect of Media Coverage on Donations to Each Relief Agency (z-scores)
(Tobit)

| | (1) Television | (2) Newspaper |
|---|----------------------|----------------------|
| Media Coverage (Minutes or Word Counts) | -0.0055 (0.87) | 0.00060 (0.56) |
| Log Days After | -0.3133*** (3.99) | -0.3255*** (4.03) |
| Dummy for 31 January | 0.6149*** (2.74) | 0.6253*** (2.64) |
| Agency 2 | 0.6274*** (4.79) | 0.6572*** (4.67) |
| Agency 3 | 0.4519*** (3.82) | 0.4589*** (3.39) |
| Agency 4 | 0.2236** (2.24) | 0.2376** (2.14) |
| Agency 5 | 0.6087*** (4.81) | 0.6090*** (4.25) |
| Agency 6 | 0.6057*** (4.83) | 0.6701*** (5.39) |
| Agency 7 | 0.6343*** (4.91) | 0.7525*** (5.83) |
| Agency 8 | 0.8840*** (7.12) | 0.7834*** (5.19) |
| Media Coverage*Agency 2 | 0.0616*** (3.56) | 0.0092** (2.56) |
| Media Coverage*Agency 3 | 0.0878*** (4.25) | 0.0137*** (3.62) |
| Media Coverage*Agency 4 | -0.0068 (0.93) | -0.0012 (1.39) |
| Media Coverage*Agency 5 | 0.0896*** (3.63) | 0.0138*** (2.68) |
| Media Coverage*Agency 6 | 0.0005 (0.08) | -0.0012 (1.14) |
| Media Coverage*Agency 7 | 0.0147* (1.77) | -0.0036** (2.42) |
| Media Coverage*Agency 8 | 0.0531* (1.89) | 0.0104* (1.69) |
| Constant | 0.2931 (1.04) | 0.2621 (0.81) |
| Observations | 709 | 709 |
| Censored Observations | 118 | |

NOTE: Absolute value of robust z-statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%