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Terrorism and philanthropy: the effect of terror attacks on the scope of giving by individuals and households

Claude Berrebi[1] · **Hanan Yonah**[1]

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Abstract Behavioral reactions to terrorism may be displayed in different ways. While some individuals react by holding back on their financial and charitable activities following stressful events, others may express more generosity by increasing their giving due to solidarity and empathy with the victims, or out of heightened nationalism and patriotism. Using a longitudinal analysis of the Israeli–Palestinian conflict as a case study to uncover the relations between terrorism and philanthropic behavior, we find that terror attacks increase considerably the scope of giving by individuals and households. Our empirical approach relies on a unique panel dataset of 152,731 tax itemizer philanthropists and terrorism data from 1999 to 2011. The results are statistically significant and robust across a multitude of model specifications. Furthermore, we use an instrumental variable approach to identify a causal link and address potential endogeneity concerns. This study is, to the best of our knowledge, the first attempt to empirically identify and quantify the effect of sequential terror attacks on philanthropy over a relatively long period using detailed micro-level information.

Keywords Terrorism · Philanthropy · Panel data

JEL Classification C23 · C33 · C36 · D12 · D14 · D74 · H27 · J10

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✉ Claude Berrebi
claude.berrebi@gmail.com

Hanan Yonah
hanan.yonah@mail.huji.ac.il

[1] The Federmann School of Public Policy and Government, Hebrew University, Mount Scopus, 91905 Jerusalem, Israel

1 Introduction

Immediately following the terror events of 9/11, many leading performing artists expressed their support for the victims and their families by donating substantial amounts of money to them. In the wake of the attacks, Madonna donated the full proceeds from a concert, Jim Carrey donated $1 million and Julia Roberts donated $2 million to help the survivors. Britney Spears raised almost $1 million with her US tour, which began in November 2001; Paul McCartney, Michael Jackson and David Bowie performed at benefit concerts, raising $2 million for the victims collectively. Celebrities were not the only ones to respond in this manner. Corporations reacted immediately as well, contributing more than $180 million in one single week.[1] Observing these anecdotal reactions, we wonder whether it would be reasonable to expect an increase in donations as a result of traumatic events such as terror attacks? theory alone does not provide a definitive answer.

Philanthropy is a significant phenomenon that has a substantial impact on society, the economy and public policy. Much has been written about the social importance of philanthropic behavior. Charitable giving may depend on the strengths of the relationships between individuals and the social networks in which they are embedded, the extent to which individuals identify with their communities, the impulse to provide safety nets to disadvantaged groups, the narrowing of the gap between groups from different socioeconomic classes, expressing and supporting the individual's values and more (Frumkin 2006; Payton and Moody 2008).[2] Total giving in the United States during 2014 exceeded $358 billion, which amounts to about 2 % of the GDP. The largest portion of charitable giving (72 %), was contributed by households and individual donors (Giving USA Foundation 2015). This level of philanthropy has remained steady over the years; Americans are more generous than the citizens of any other country. In Israel, total contributions in 2011 were about $1.58 billion (0.6 % of GDP), with the largest portion (approximately 70 %) donated by households and individual givers (Israel Central Bureau of Statistics 2014).[3] Western societies, including Israel, recognize the importance of philanthropy, taking actions and implementing policy in order to develop and encourage the culture of charitable donations (e.g., through tax incentives). The literature on philanthropy explores the effects of socioeconomic, psychological and cultural variables on charitable behavior, yet the effect of terrorism on philanthropy has not been studied. Terrorism is the premeditated use or threat to use violence in order to obtain a political or social objective by intimidating a large audience beyond that of the immediate victims (Enders and Sandler 2006). In practice, most definitions of terrorism share the notion that terrorism is a violent action against civilian targets in order to gain political and territorial concessions. In this study we use the definition set forth by the US State department, which defines terrorism as "premeditated, politically motivated violence perpetrated against noncombatant targets by sub-national groups or clandestine agents, usually intended to influence an audience." This definition fits our purposes and turns out useful since the US State department already has identified and categorized the set of

[1] For example, in the days following the 9/11 attacks, ExxonMobil, Coca-Cola and AT&T donated more than $10 million each. Also, on April 16th 2013, the day following the Boston Marathon bombings, a fund was created in order to accept the outpouring of donations by individuals and corporations.

[2] "Man naturally desires, not only to be loved, but to be lovely…" (Smith 1759).

[3] ICBS (Israel Central Bureau of Statistics), Philanthropy of Israelis 2009–2011, a press release: (www.cbs.gov.il/www/hodaot2014n/08_14_053b.pdf).

contemporary terrorist groups (Berrebi 2007; Krueger 2008).[4] The tactics used by terror groups to achieve their goals aim to stage shocking events or a series of shocking events that create an impact many times greater than the costs of inputs required for their execution.[5] The desired effect of terrorist's tactics are not necessarily the direct consequences of the violence (deaths and property damage), but primarily the climate of fear triggered among the targeted population. Although the likelihood of being harmed by terrorism is negligible, the fear and uncertainty generated by terror events have huge and enduring effects on human behavior. Beyond the direct losses from terrorist acts, the resultant "terror"—the intense and prolonged fear of imagined dangers—has other long-term repercussions, such as the shifting of individuals' political preferences (Berrebi and Klor 2008; Getmansky and Zeitzoff 2014) and the costs of stronger security measures and changes in individual choices (Becker and Rubinstein 2011).[6]

Terrorism exacts physical, emotional and economic tolls; large numbers of casualties and extensive property damage demand responses beyond those typically supplied by the government. This gap is filled partially by nonprofit organizations dealing with the consequences of terror attacks and their related aspects. For the most part, these organizations rely on contributions (such as support for terror victims, physical and post-trauma rehabilitation, promoting coexistence and dialogue, and compensation for the loss of income and infrastructure). Accordingly, we may observe a local effect on philanthropy as a result of terrorism. A terror attack induces residents of the targeted community to alter their daily routines as a consequence of changes in their perceived risks of personal harm, producing a direct effect on their attitudes toward philanthropy. Terror attacks may also impact the locality's economy and its residents' expected future incomes (Berrebi and Klor 2008; Berrebi and Ostwald 2013).

Behavioral reactions to terror attacks may be displayed in different ways. While some individuals react by reducing their financial activities (including charitable giving) following stressful events, others may become more generous in order to express solidarity and empathy with the victims, or out of heightened nationalism and patriotism. Steinberg and Rooney (2005) showed that the responses of individuals and corporations to the 9/11 terrorist attacks were immediate and unprecedented. Studies analyzing the aftermath of the 9/11 attacks found that Americans were willing to donate more time and money than before (Putnam 2002; Torabi and Seo 2004). Jonas et al. (2002) demonstrated that reminding people of death leads to more favorable attitudes toward charitable donations. In experimental studies, Ferraro et al. (2005) and Hirschberger et al. (2008) reported a positive relation between high mortality salience and the amounts contributed. On the other hand, many studies have emphasized the negative effect of terrorism on the targeted country's economy, its foreign investments, savings and economic growth (Abadie and Gardeazabal 2008; Berrebi and Klor 2010; Eckstein and Tsiddon 2004; Eldor and Melnick 2004; Fielding 2003a, b; Krueger 2008). The declines in economic indicators following a terror attack, together with the senses of vulnerability on the part of individuals who were affected by terrorism, could potentially result in a reduction in the scope of giving by local philanthropists following terror attacks.

[4] Office of the Law Revision Counsel, U.S. House of Representatives, Title 22 of the U.S. Code, Sect. 2656f (d).

[5] The impact also is intended to be greater than a similar increase in perceived risk associated with other types of events (Becker and Rubinstein 2011).

[6] Compared to other relatively rare events such as being struck by lightning.

In this paper we study the relations between terror attacks and the scope of giving by individuals and households in Israel. Using longitudinal data with multiple treatment periods and differing treatment intensities across time and space in a fixed effects approach, we analyze terror events by date, geographic location, attack method and other characteristics, along with information about charitable giving following these events. Our information on Israeli philanthropists includes their annual amount of giving to formal nonprofit organizations as well as their geographic locations (in addition to other demographic and economic variables). This allows us to study potential changes in giving patterns by philanthropists in localities that were affected directly by terrorism, compared to a control group of philanthropists in other localities not subjected to terror attacks, while holding constant income and other demographic variables.

The goal of this study is to contribute to a growing body of literature on philanthropy that addresses questions with respect to the willingness of people to make contributions and to a growing body of literature on the relation between terrorism and socioeconomic behaviors. While research relating to natural disasters or terrorism and philanthropy typically have investigated a single case study, the analysis herein is, to the best of our knowledge, the first attempt to investigate the effect of sequential terror attacks on philanthropy over a relatively long period.[7]

2 Background and theoretical framework

The beginning of the second *intifada* (Palestinian uprising) in September 2000 launched a new era of violence following a period of relative calm. Thousands of terror attacks against Israeli targets were carried out from the end of 2000 through 2007, killing hundreds and wounding more than 5000 civilians.[8]

The underlying motivation for this study relies on two classes of theories: those that predict increases in giving after an act of terror and those that predict declines in giving following such events. Among those, five theories seem most suitable to serve as a conceptual framework for analyzing the question of how terrorism affects philanthropy. They are the "stress theory" and the "conservation of resources model" from psychology, the "terror management theory" and the "identifiable victim effect" from the fields of sociology and philanthropy, and the economic theory based on the marginal utility of gifting.

Stress theory focuses on the causes of psychological pressure in the context of an environment that is perceived as threatening an individual's livelihood and endangering their well-being. Lazarus and Folkman (1984) discuss the "concept of vulnerability" as related to adequacy of one's personal incomes and wealth. Vulnerability is described as a potential threat that is turned into an active threat when one's resources actually are put in jeopardy.

According to Hobfoll's conservation of resources (COR) model, people strive to build and protect their assets, and stress can threaten or result in a potential or actual loss of these assets, which include both material and psychological resources (Hobfoll 1989, 2001, 2011). This model provides a framework for examining the impact of adverse experiences on individual's actions following a major stress event.

[7] Most papers on this topic dealt with events such as the 9/11 terror attack (Steinberg and Rooney 2005) or Hurricane Katrina (Chamlee-Wright and Storr 2010; Shughart 2006; Sobel and Leeson 2006).

[8] Israel Ministry of Foreign Affairs (http://www.mfa.gov.il/MFA/ForeignPolicy/Terrorism/Palestinian/Pages/Victims%20of%20Palestinian%20Violence%20and%20Terrorism%20sinc.aspx).

Terror management theory (TMT), first articulated by Greenberg et al. (1986) and based on Becker (1971), suggests that self-esteem, the belief that one is a valuable person within the context of one's cultural conception of reality, shields people from the fear of death. In other words, the awareness of one's mortality (the salience mortality paradigm) intensifies desires to express pro-social attitudes and to engage in pro-social behavior (Jonas et al. 2002).

The identifiable victim effect suggests that people are inclined to spend more to save the lives of recognizable victims than to save equal numbers of unidentified or statistical victims (Jenni and Loewenstein 1997).

Finally, the economic theory based on the marginal utility of gifting was developed by De Alessi (1967) and Dacy and Kunreuther (1969), who suggested that disastrous events may introduce short-run structural changes in individuals' utility functions, moving them toward greater charity. The hypothesis is that individuals also derive utility from increases in the welfare of others, and it implies that individuals would be willing to give away part of their wealth as long as the utility derived from the gifting is greater than the utility that could have been generated from allocating their wealth to alternative uses. Hence, if the cost of acquiring utility from gifts declines (following a terrorist event) relative to that of acquiring utility from other sources, ceteris paribus, individuals will increase the sizes of their gifts. In other words, following a terror attack, the wealth and welfare of some individuals within the community falls dramatically. Consequently, the utility maximization hypothesis as well as the declining marginal utility of income assumption implies that a gift of a dollar yields more utility to a donor after a terror event than it did before. Since it is now cheaper to acquire utility from charitable donations relative to the cost of acquiring utility from other sources, economic theory asserts that donors will increase their charitable gifts until, at the margin, equilibrium conditions are restored. "It is good to do good, and the lower the price the more good (as the donor sees it) will be done" (De Alessi 1975).

We therefore present two sets of theories. Based on the stress and COR models, we would expect that donors, who have been exposed to terror attacks, feel vulnerable and threatened by the potential loss of emotional and material resources and therefore will be less inclined to donate. On the other hand, according to the TMT and the identifiable victim effect, philanthropists will be motivated to donate more after terror attacks, owing to the pro-social behavior evoked by mortality salience and out of empathy for the victims, especially if the tragedy occurred nearby where the victims are more likely to be identifiable. The economic theory based on the marginal utility of gifting also suggests the possibility of larger contributions following terrorism, while traditional economic theory might suggest the opposite effect because of the grim economic forecasts typically associated with the aftermath of terrorism. Accordingly, the effect of terrorism on charitable giving is theoretically ambiguous and needs to be determined empirically. Our analysis, based on the Israeli experience following terror attacks, will help us determine which class of theories are better supported empirically.

3 Data

To analyze the effect of terrorism on philanthropy, we constructed a panel dataset consisting of demographic and socioeconomic information on every donor in Israel who claimed tax credits for charitable giving during 1999–2011. This donor information is then merged with terrorism data for that period.

3.1 Philanthropy data

Philanthropic information was obtained and merged from two sources: (1) the Israeli Tax Authority, and (2) the Israeli Central Bureau of Statistics—Population Registry.[9] Those sources provide us with about 1,378,170 observations derived from the tax returns submitted by 153,130 individuals and households claiming tax credits for contributions to "certified" non-profit organizations during at least one of the following years: 1999, 2000, 2004, 2006–2011.[10] This information represents the entire universe of all donors who claimed tax credit during this period. For each observation, the dataset also includes economic variables, such as annual income, spouse's annual income, source of income (salaries, business profits or loss, interest, capital gains, and so on), the amounts donated by each individual and household per year and the total tax credit received. This information was paired with annual sociodemographic data for each observation culled from the Population Registry. The dataset includes, on an annual basis, sociodemographic variables, such as age, marital status, residential address and number of children.[11] Individual, who died during the sample period were excluded from the data following the year of death, which brings the total number of observations to 1,359,251.

Table 1 presents a summary of the donors' statistics. Donors' average annual contribution was 2943 NIS* (about $822).[12] This figure is higher than findings reported in previous studies of Israel, which were based on telephone surveys (Haski-Leventhal et al. 2011; Katz et al. 2007). The average donation according to these surveys was 750 NIS (N = 1000) in 2006 (865 NIS*) and 1540 NIS (N = 1538) in 2008 (1690 NIS*). Based on our data, donors' average annual income was 298,508 NIS* (about $83,426), more than twice the average income in Israel in 2011.[13]

Demographically, 98.89 % of all itemizers are Jewish. The oldest donor is 106 years old, and the youngest individual in our dataset is 7 years old. Children younger than 18 do not submit tax returns. However, since our data consist of a full and complete panel, it includes young donors who claimed tax credits in the later waves of the panel. The youngest donor's age when donating was 18.[14] The median donation is 0 since most individuals are inconsistent donors who donated only in one or a few years, whereas in the other years they reported no donations. The average donor's age was 48.61 years and 19.19 % of the donors were female.[15] Married donors account for 81.68 % of the charitable givers and the average number of children among donors was 2.89.

Table A1 in the Online Appendix presents summary statistics of the trend in philanthropy over the sample period. While the number of itemizers who claimed tax credits more than doubled over the years—from 29,419 individuals in 1999 to 61,038 in 2011—total donations increased by almost four times (in real terms) during that period.

[9] The dataset was created for the purpose of this particular study and is not readily publicly available.

[10] Years in which the Israeli Income Tax Authority's data are available.

[11] We excluded from the analysis 399 tax returns representing entities, which are not individuals, or individuals who are neither Israeli citizens nor Israeli residents. These cases (a total of 3591 observations) had neither an indication of a residence address in Israel nor any socioeconomic information.

[12] Amounts in NIS* correspond to New Israeli Shekels (NIS) in fixed 2011 NIS (i.e., in real terms).

[13] ICBS: http://www.cbs.gov.il/reader/?MIval=cw_usr_view_SHTML&ID=404.

[14] Owing to privacy concerns our age variable has been divided into five categories: 0–20, 21–40, 41–60, 61–80 and 81+.

[15] In the case of household donations, gender is associated with the head of household.

Table 1 Philanthropy summary statistics

	Mean	SD	Min	Max	P50
Donation	2943	150,078	0	113,858,344	0
Income	298,508	979,235	−33,521	942,341,376	200,917
Age[a]	48.61	14.57	7	106	49
# Children	2.89	2.01	0	21	3
Females	19.19 %				
Married	81.68 %				
Jewish	98.89 %				
N = 1,359,251					

Table 1 reports summary statistics for a panel dataset of 152,731 tax itemizers-individuals and households who contributed at least once during the years 1999, 2000, 2004, 2006–2011. All monetary variables are in 2011 New Israeli Shekels (NIS)

Minimum donors' age computed for full panel dataset which includes donors who contributed in the later waves of the panel. Minimum donor's age who reported donations over 0 NIS was 18. Individuals who died during the data period were excluded from the data following the year of death

[a] Age has been divided into five groups in order to protect the privacy of the individuals in the dataset, the groups are: 0–20, 21–40, 41–60, 61–80, 81+

Theoretically, one could question whether the set of tax itemizers who claimed tax credits for their donations are representative of all donors. Indeed, individuals and households who make non-substantial (i.e., small) donations are less likely to submit tax returns. However, these donors are of lesser interest for the purpose of this study. Since philanthropy is motivated by many factors and a stressful event such as a terrorist attack is only one variable among many, it is unlikely to have noticeable effect on small donors. This study focuses on those likely to make substantial donations.[16]

3.2 Terrorism data

Our dataset on terror attacks contains daily information on each and every terror attack on Israeli soil against noncombatants that resulted in one or more fatalities between 1999 and 2011. During this period, 433 fatal terror attacks occurred against Israeli citizens and residents, killing 1162 people and injuring thousands more. The data do not include failed attacks (i.e., attacks that were foiled or attacks with no casualties). Each observation includes detailed information about the weapon used by the perpetrators (e.g., gun, bomb, suicide attack, knife or rocket), the specific date and the geographic location (by locality) of the attacks, and the number of fatalities. This dataset was constructed by Berrebi (2007), and updated in Benmelech et al. (2012). The information on the attacks was obtained from the Israeli Foreign Ministry, the Israeli National Insurance Institute, the Israeli Defense Forces and the archives of two Israeli newspapers (*Ma'ariv* and *Ha'aretz*).

Table 2 presents summary statistics on the terror attacks. Overall, during the period studied, an average of 33.31 terror attacks occurred each year, causing 89.38 fatalities on the average. While the most frequent method of attack was by gun (n = 209) (not presented in the table), suicide attacks (n = 81) caused the largest number of fatalities

[16] Since the decision to engage in philanthropic behavior might be endogenous, one should be careful in generalizing our findings to the entire population.

Table 2 Terrorism descriptive statistics

Year	All terrorist attacks		Suicide bombers' attacks	
(1)	# Attacks (2)	# Fatalities (3)	# Attacks (4)	# Fatalities (5)
1999	4	6	0	0
2000	29	38	0	0
2001	104	210	14	84
2002	102	395	31	219
2003	48	189	17	142
2004	35	96	8	55
2005	25	55	6	24
2006	38	94	2	15
2007	6	9	1	3
2008	18	30	1	1
2009	7	8	0	0
2010	6	9	0	0
2011	11	23	1	1
Total	433	1162	81	544

(n = 544). During the data period, the fatalities per suicide attack were 3.8 times larger than fatalities per attack by all other terrorism methods. The largest numbers of fatalities was recorded in the most populated cities—Jerusalem, Tel Aviv and Haifa, resulting in 231, 84 and 84 fatalities, respectively (not presented in the table).

3.3 Data on localities' proximity

To strengthen the causal interpretation of our results, an IV approach using terrorist incidents in neighboring jurisdictions was implemented. Data on distances between localities were obtained from the Israel Central Bureau of Statistics (ICBS) and the Israeli Ministry of the Interior. The dataset contains the X and Y coordinates of each locality in Israel's geographic coordinates system, also known as the Israeli Transverse Mercator. This information enabled us to calculate the distances between localities and determine the set of neighboring towns within a given radius for each of Israel's local terrorist targets. Using those data, we generated lagged measures of proximate terror attacks and fatalities in neighboring localities within a radius of 20 km to be used as instruments for a locality's level of terror incidents.

4 Methodology

This section describes our main empirical strategy for identifying the causal effects of terrorism on philanthropy. The strategy is based on longitudinal (panel) data that uses the variation in terror attacks across time and space to control for time- and location-specific effects. This methodology allows us to estimate the causal effect of terrorism by comparing changes in giving patterns by philanthropists who live in localities that suffered from terror

attacks (treatment group) versus changes in the scope of giving by philanthropists in other localities that did not suffer from terror attacks (control group). The key identifying assumption is that in the absence of terrorism, the trends in giving preferences by treatment and control groups would be the same once other local and individual characteristics have been held constant.[17]

The unit of observation is an individual philanthropist and the dependent variable is the amount of annual giving by that philanthropist. This approach is described by the following fixed effects model:

$$donation_{ilt+1} = \alpha + \beta terrorism_{lt} + \gamma socio\_demg_{it} + \varrho locality_l + \tau_t + \varepsilon_{ilt+1}$$

where donation_{ilt+1} is the scope of giving by philanthropist i in locality l in year $t + 1$, $terrorism_{lt}$ is the number of terror attacks in locality l in year t, $socio\_demg_{it}$ is a vector of socioeconomic and demographic control variables for individual i at time t, $locality_l$ is a locality fixed effect unique to locality l, and τ_t is the time fixed effect. The last captures time-specific changes that would affect all philanthropists simultaneously.[18] The proposed econometric specification is intended to identify the local effect of terror attacks on the scope of giving.[19]

We estimated the effect of terrorism on philanthropy using a panel dataset of 152,731 individuals and households in 264 localities over the 9-year period between 1999 and 2011. Our specifications utilizes a panel ordinary least squares (Panel - OLS), framework with both locality and year fixed effects, which mitigate many of the concerns for potential omitted variable bias. Factors such as the geographic locations and physical characteristics of localities tend to persist. The locality fixed effects model allows us to control for these and other time-invariant factors that could influence the donor's behavior in any particular locality. Once we control for time and locality factors, the assumption for a valid causal interpretation is that any remaining within-locality variation in terrorism is exogenous. This assumption is supported strongly in the Israeli context. Terrorist targets tend to be determined by a locality's characteristics, such as proximity to terror bases, proximity to borders and the symbolic importance of the target (Berrebi and Lakdawalla 2007). Once the time-invariant features are controlled for by the locality fixed effect, the remaining within-locality variation in terrorism is likely to be exogenous. In addition, we might want to account for changes in national tax policy that may influence the itemizers' giving decisions across all localities, or we may be concerned with the effects of the timing of nationwide security events, political negotiations and accords. This is why we also enter

[17] Importantly, unlike the traditional difference-in-differences approach, our methodology has the additional advantage of relying on an explanatory variable with differing treatment intensities across localities on a yearly basis. See Angrist and Pischke (Angrist and Pischke 2009, Chap. 5) for a thorough explanation of the panel fixed effects model with multiple periods and differing treatment intensities across time and space.

[18] Spatial and temporal fixed effects help support the exclusion of local and state activities (such as counterterrorism and other responses to attacks). See Benmelech et al. (2015) and Dugan and Chenoweth (2012) for the effects of different responses to attacks.

[19] For robustness sake, and in order to estimate separately the effect of terrorism outside of the donor's locality, we also estimated models that include controls for the countrywide effects of terror attacks in addition to the yearly temporal fixed effects. See Table A2 in the online appendix.

year fixed effects to control for any time specific factors, such as national trends in giving patterns that would affect all localities and donors equally in any given year.[20]

In our main specification we estimate a model in which the independent covariates are lagged one year, which is in line with the literature's customary practices. We find this approach to be the most appropriate because it assumes that all of the events of the previous year are reflected in the current year's charitable donations.[21]

While fixed effects models reduce many of our concerns with respect to omitted variable bias, endogeneity of other terrorism variables potentially remain an issue. Specifically, as noted earlier, exogeneity requires that the within-locality variation in terrorism be unrelated to any of the within-locality changes in unobservable factors affecting philanthropy. Simply put, after controlling for socioeconomic and demographic factors, we want to make sure that our measures of terrorism are strictly exogenous. To address endogeneity concerns further, we implemented an instrumental variable (IV) approach. Doing so will allow us to obtain consistent parameter estimates. To be valid, the IV must be predictive of the endogenous regressor while remaining independent of the error term. To that end, we had to find a variable predictive of the level of terrorism, but not associated with charitable giving except through the influence of terrorist attacks.

Our approach uses lagged domestic terrorism incidents and fatalities in neighboring localities as instruments for a locality's level of terrorism. We chose domestic terrorism in neighboring localities as our instrument for two main reasons. First, high correlation with our potentially endogenous regressor (locality's level of terrorism). Second, independence with respect to the dependent variable (charitable giving).

Empirical studies have shown that terrorist shocks are likely to influence levels of domestic terrorism in neighboring geographical places, finding that local terrorism often spread to bordering areas (Berrebi and Ostwald 2013; Enders et al. 2011). Accordingly, nearby terrorism and local terrorism tend to be highly correlated. With respect to independence, the literature on the segregated nature of Israel's localities and the lack of socioeconomic, demographic and political spillovers among neighboring localities is vast. For example, the Floersheimer Institute (2006) and the Institute (2009) provide strong evidence about persistent segregation and differences among adjacent localities in Israel. Hence factors that could simultaneously influence both terrorism and charitable donations in a specific locality are typically domestic (e.g., economic, political, geographic and demographic characteristics). These factors are therefore unlikely to be related to the neighboring area's local conditions (except for the effect through terrorism).

As noted, our methodology relies on the exogeneity of our instrument, so that after controlling for the above-mentioned covariates, philanthropy in a given locality is affected by neighboring localities' domestic terrorism only through its effect on the level of terrorism in the locality in question. For the IV specifications we use lagged neighboring domestic terrorism incidents and fatalities in the range of 20 km as our instruments.[22] In addition, controls for time and locality fixed effects account for inherent temporal shocks

[20] All models include standard errors clustered at the individual level, which are robust to arbitrary heteroscedasticity and serial correlation.

[21] The philanthropy data are provided on an annual basis; therefore, it is impossible to know when a contribution was made during the year. Using a lagged model as our main specification increases our confidence in the chronological order of the events, in which terror attacks occurred prior to contributions. This avoids the possibility that a donation made in January for example is being "explained" by attacks that occurred later that year.

[22] Since, owing to imagined spillovers, a possible concern always remains that neighboring terrorism will affect charitable giving in nearby locations directly. We additionally tested larger geographic distances

as well as spatial fixed differences between localities. Our formal two-stage least squares (2SLS) IV model for the effect of terror attacks on philanthropy is described as follows:

Second stage:

$$donation_{ilt+1} = \alpha + \beta terrorism_{lt} + \gamma socio\_demg_{it} + \varrho locality_l + \tau_t + \varepsilon_{ilt+1}$$

First stage (neighbouring terrorism):

$$terrorism_{lt} = \acute{\alpha} + \omega \sum_{k=1}^{n} (near\_terror_{k \neq l,t-1,t-2}) + \acute{\gamma} socio\_demg_{it} + \acute{\varrho}_l locality + \acute{\tau}_t + \acute{\epsilon}_{lt}$$

The excluded instrument used was $near\_terr_{k \neq l,t-1,t-2}$.

The variable $near\_terr_{k \neq l,t-1,t-2}$ is the number of terror attacks and fatalities in locality k (within a distance of 20 km radius from the donor's locality l), in years $t-1$ and $t-2$, $socio\_demg_{it}$ is a vector of time variant socioeconomic and demographic control variables for individual i at time t. Locality and year fixed effects are labeled $locality_l$, and τ_t, respectively. The parameter β captures the effect of terror attacks in locality l on the scope of giving by philanthropists living in that locality.

Finally, our analysis also allows for the possibility that the effect of terrorism may have different impacts on different subgroups of populations, even if its overall effect is positive. To account for these effects, we include interaction terms in our baseline models. The interaction terms are the product of terrorism and various demographic indicators for each donor. These include: gender, marital status, religious affiliation, and ethnic origin indicators. This allow us to estimate the particular responsiveness of each subcategory of donors to terrorism. Also, as the literature on charitable contributions emphasizes income, wealth and persistent giving, we present three additional models with interactions terms which are the product of terrorism and donor's income, whether or not they rely on salaried income, and whether or not they persistently contribute to charity. These additional models allow us to estimate the marginal effect of income, its sources, and persistent giving in conjunction with terrorism on the donated amounts.

5 Empirical results

5.1 Main specification

Table 3 reports the results for our baseline model in which we estimate the effect of lagged terror attacks on the scope of giving by Israeli philanthropists. The first row shows the coefficient for the effect of terrorism within a locality, which is our main variable of interest. The analysis uses our panel data to exploit both spatial and temporal variations, as well as to include year and locality fixed-effects, to further reinforce evidence of a causal connection between the severity of terrorism and philanthropy.

Our preferred specification is presented in column six and includes the full set of explanatory variables. The results presented in the table support the hypothesis that terrorism positively affects philanthropy. We observe a statistically significant and positive

Footnote 22 continued
(where direct spillovers are less likely) and within reasonable distance (from 10 to 40 kM) provided qualitatively similar results.

Table 3 Panel OLS-the effect of terrorism on philanthropy

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: donation (t + 1)						
Terror	325.3448** (136.4504)	326.1609** (136.5739)	320.9631** (136.4274)	320.9513** (136.4270)	320.3565** (136.3139)	320.3414** (136.0330)
Income	0.0011 (0.0009)	0.0011 (0.0009)	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)
Age		1053.1975*** (287.5542)	767.1104*** (267.0075)	765.6473*** (266.9418)	751.9388*** (266.3220)	752.7461*** (264.2923)
Children			535.8777*** (110.7947)	534.8045*** (110.7990)	480.1629*** (123.7779)	480.2579*** (121.9076)
Non Jewish				−1148.1414*** (319.1777)	−1181.4940*** (320.3199)	−1181.6967*** (318.9929)
Non Married					−745.0110** (369.4015)	−749.8174 (528.0641)
Female						18.4118 (825.8353)
Constant	−1240.1606** (518.8457)	−3145.3079*** (843.3501)	−3909.5715*** (934.3996)	−3904.6699*** (934.1304)	−3561.9907*** (1018.9578)	−3566.7916*** (892.2067)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes
N	902996	902996	902996	902996	902996	902996
R^2 overall	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008

Terrorism terror attacks in the donor's locality

Significance levels: *** is 0.01, ** is 0.05, and * is 0.10; clustered standard errors in parentheses

effect of terror attacks on the scope of donations to formal organizations in the subsequent year.[23] In the other covariates, we see that age and the number of children are positively associated with charitable contributions in the following year. Non-Jewish religious affiliation is negatively associated with donations.[24] Older donors and those with more children tend, on average, to make larger contributions. These findings are consistent with the literature about the relationship between age, having children, and philanthropy (Bekkers and Wiepking 2010).

Though the mechanism for reverse causality between contributions and terrorism fatalities seems unlikely, we lag the explanatory variables both to ascertain the chronological order of the events, in which terror attacks occurred prior to contributions, and in order to better address endogeneity concerns. The effect presented in our preferred specification translates into a 10,444 NIS* (about $2900) increase in average donations observed in the year following one standard deviation increase in the number of terrorist attacks.[25] To put these findings into perspective, one should note that this effect is larger than the average US household's annual charitable donations, and more than 3.5 times the average Israeli household's annual donations among charitable contribution itemizers.[26] In context of the Israeli income distribution this effect exceeds the gross monthly earnings of 70 % of the nation's employees, and is larger than the average gross monthly income.[27] Our results are robust to the inclusion of various controls and the relationship between terror attacks and giving remains consistently statistically significant.

It is possible that terror attacks outside the donor's locality could also affect the scope of giving. Terrorism beyond the donor's locality is accounted for in our models by entering year fixed effects. However, to alleviate any remaining concerns we additionally examined this potential spillover effect in a longitudinal analysis setting. Since the sum of terror attacks in a donor's locality and terror attacks outside the locality is a constant for all localities in any given year, it is impossible to simply add a variable for all the terrorist attacks outside the donor's locality as an explanatory variable in the model. One way to overcome this obstacle and still account for terror events that occurred outside the locality, beyond the control provided by the year fixed effects, is to limit the analysis to terror events outside the locality that occurred in a nearby relevant geographical range (e.g., within the region, district and sub-district). Districts and sub-districts were defined in accordance with ICBS definitions. Regional boundaries were expanded to cover a wider geographical area, so that Israel was divided into four main regions: North, South, Center and an area outside the 1967 borders. Table A2 in the Online Appendix shows clearly that no additional effect of terror attacks outside a donor's locality materializes once year fixed effects are entered. The remaining coefficients for all other control variables remain of similar magnitude and direction, and maintain similar statistical significance to the ones reported in Table 3.

[23] "Formal" or "qualified" organizations are similar to approved 501(c)(3) organizations in the United States.

[24] Non-Jewish residents are minorities in Israel.

[25] A one standard deviation change in the number of yearly terrorist attacks equals 32.6034.

[26] Based on an Urban Institute (2013) report, the average annual charitable contribution by US households between 2001 and 2011 is $2689 in 2011 fixed dollars. Source available at: http://www.urban.org/sites/default/files/alfresco/publication-pdfs/412923-The-Nonprofit-Sector-in-Brief-Public-Charities-Giving-and-Volunteering-.PDF

[27] Earnings distribution statistics were obtained from Knesset Research and Information Center (2013). Source available at: http://www.knesset.gov.il/mmm/data/pdf/m03346.pdf. To this day the average monthly income never reached 10,000 NIS and currently (May 2016) is 9355 NIS*. Income statistics were obtained from the ICBS http://www.cbs.gov.il/reader/shnaton/templ_shnaton.html?num_tab=st12_34&CYear=2012.

5.2 First differenced model

The fixed effects estimator helps address locality specific omitted variable concerns. However, in cases of serial correlation the standard errors can be underestimated. To address this concern and to test the robustness of our findings we estimated the following first-differenced model:

$$\Delta donation_{il(t+1-t)} = \beta \Delta terrorism_{l(t-t-1)} + \gamma \Delta socio\_demg_{i(t-t-1)} + \varepsilon_{lt+1}$$

Differencing serves the same purpose as locality-fixed effects, eliminating locality-specific, time-invariant factors, but has the additional benefit of alleviating concerns of serial correlation as well as focusing explicitly on the effect of a change in terrorism on changes in the scope of giving. In Table A3 in the Online Appendix we report the results of the first-differenced model's estimation. As before, we find that the effect of terror attacks on the annual amount of donations remains positive and statistically significant, which reinforces confidence in our findings of a positive effect.

5.3 Instrumental variable approach

To further reinforce the causal argument for an effect, and since endogeneity between philanthropy and terrorism potentially could be a concern that must be addressed in order to establish greater certainty in a causal relationship and in the direction of the effect, we additionally estimated an instrumental variable approach using terrorism in neighboring localities to instrument for local terrorism. Table 4 reports the results of this analysis. Once again we find that local terrorist attacks increase the scope of giving in the subsequent year. In order to be valid, our instruments must satisfy both conditions of relevance and exclusion restriction. The F-statistic tests the relevancy of our instruments. Its large magnitude suggests that our instruments are strongly correlated with the potentially endogenous regressor. Since we use multiple instruments, we can also test the validity of our exclusion restriction (to be precise, the over-identifying restrictions) with the null hypothesis being that our instruments are valid. Hansen's J statistic tests this hypothesis. The resulting p value shows that the null is far from being rejected at any acceptable statistical significance, hence supporting the validity of our instruments. Our IV results reflect the netted out effect of terrorism on donations. On the one hand, the netted effect typically returns smaller coefficients; on the other hand, our instruments, by design, include the entire neighboring terrorism environment and are therefore likely to result with an effect of larger magnitude. Overall, we find our IV coefficients to be larger than the ones obtained from OLS estimation. Whether or not we include the full set of control variables, however, the terrorism coefficient remains positive and statistically significant. Other covariates display results similar to our findings in earlier specifications. The results of our IV analysis provide reassuring evidence that the link found earlier is indeed causal, alleviating potential endogeneity concerns with respect to the effect of local terrorism on philanthropic donations.

5.4 Log variations

Some researchers may argue that the effect of terrorism is non-linear, and should rather be analyzed based on relative changes as opposed to discrete changes. Others may argue that the effect should be analyzed in such a way that it measures relative changes in the

Table 4 IV Approach: nearby domestic terrorism

Instruments	Lagged (t−1 and t−2) nearby terror attacks and fatalities					
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: donation (t + 1)						
Terrorism	1900.324** (968.2644)	1897.626** (967.4722)	1890.964** (966.3373)	1890.734** (966.3428)	1891.833** (966.3618)	1892.39** (966.407)
Income	0.0008914 (.0007082)	0.000892 (0.0007087)	0.0008724 (0.0006936)	0.0008723 (0.0006935)	0.0008644 (0.0006877)	0.0008622 (0.0006862)
Age		1136.306*** (374.1006)	857.977*** (334.0788)	855.925*** (334.1048)	855.5511*** (334.0902)	816.392** (330.9775)
Children			663.1024*** (128.757)	661.5635*** (128.8042)	606.0793*** (131.2835)	600.8468*** (130.9919)
Non Jewish				−1477.493*** (185.5606)	−1506.442*** (187.4765)	−1500.845*** (187.4133)
Non Married					−810.7329*** (223.9801)	−597.2425*** (227.892)
Female						−785.4447*** (201.4584)
Constant	1132.497*** (262.5175)	−1480.114 (904.9405)	−2917.831** (1126.04)	−2907.409*** (1126.277)	−2585.274** (1133.639)	−2336.557** (1119.307)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes
N	751793	751793	751793	751793	751793	751793
R^2	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006
Hansen J (p value)	0.3595	0.3610	0.3589	0.3587	0.358	0.3587
Kleibergen–Paap rk Wald F statistic	12436.96	12437.05	12436.6	12436.58	12436.54	12436.53

G2SLS regression; *Terrorism* terror attacks in the donor's locality

Significance levels: *** is 0.01, ** is 0.05, and * is 0.10; clustered standard errors in parentheses

amounts donated, as opposed to the absolute donation amounts. In order to evaluate these possibilities, we test our model using non-linear regression model specifications. The results and further details are presented in Table A4 in the Online Appendix and are consistent with the results of our main model.

5.5 Donors' subcategories

The literature on charitable giving devotes great attention to the particularities of subcategories of donors with respect to income, wealth and giving persistence (Beldad et al. 2012; Lilly Family School of Philanthropy 2014). We now turn to test whether terrorism has differing effects on different subcategories of donors.

5.5.1 Income

The first column in panel A of Table 5 presents an estimation of the effect of terrorism on donors of different incomes, by looking at the interaction between *terrorism* and *income,* where income is a continuous variable measuring the donor's yearly income in 2011 NIS. While a rise in *income* increases the average scope of giving, as can be seen by the positive and statistically significant coefficient of the income variable, the model also suggests that higher income individuals on average reduce their donations following terrorist attacks, as can be seen by the negative and statistically significant coefficient of the interaction variable. Accordingly, higher income individuals seem to be more sensitive to the income risks associated with terrorism.

5.5.2 Wealth

Wealth owners are defined as those who did not report any salaried income during the entire period. The second column of Panel A presents the coefficient for the interaction of "*Terror*" and the indicator "*Wealth Owner*". In this case we find positive and statistically significant coefficients for both the *wealth owner* indicator variable as well as for the interaction term. This suggests that wealthier donors who do not rely on salaried income are both more likely to donate more, and also more likely to increase their average donations significantly following terrorism.

5.5.3 Persistent donors

Panel B presents the effect of terror attacks on persistent charitable givers. This subcategory of donors contains individuals who contribute to charities every year. Recent research shows that persistent donors often have unique attributes (Rooney et al. 2014; Wu and Brown 2010). Interestingly, with respect to terrorism, they too, are found to contribute more than average donors, and increase their donations significantly in response to terrorism.

In summary, persistent donors and wealth owners tend to be less sensitive to income risks and respond to terrorism with larger charitable contributions.

Table 5 Panel OLS-interactions (donors' subcategories by: income, wealth, consistency)

Subcategory	Panel A		Panel B	
	(1) Income	(2) Wealth Owner	Subcategory	(3) Consistent donor
Dependent variable: donation (t + 1)				
Terrorism	939.4196*** (229.3413)	221.0980* (132.0423)	Terrorism	273.4357* (139.5923)
Income type	0.0045*** (0.0013)	5214.2777*** (1677.4205)	Consistent donor	12990.2158*** (1766.8207)
Terrorism × income type	−0.0020*** (0.0006)	6476.5699* (3375.1563)	Terrorism × consistent donor	902.6631* (505.5111)
Income		0.0011	Income	0.0010
		(0.0008)		(0.0008)
Age	765.4741*** (264.0316)	588.1033** (265.7944)	Age	461.1994* (271.4129)
Children	455.5020*** (122.0809)	513.2789*** (119.9049)	Children	394.6240*** (122.2991)
Non Jewish	−1134.2343*** (319.4577)	−1194.9261*** (320.5915)	Non Jewish	−885.4963*** (314.8034)
Non married	−250.1462 (553.0079)	−809.4305 (528.2281)	Non married	−633.8647 (525.4158)
Female	109.8907 (824.7775)	−58.5847 (828.9716)	Female	186.2382 (823.7896)
Constant	−4463.8256*** (937.0053)	−3323.5170*** (895.6400)	Constant	−3188.7851*** (901.6219)
Time FE	Yes	Yes	Time FE	Yes
Locality FE	Yes	Yes	Locality FE	Yes
N	902996	902996	N	902,996
R^2 overall	0.0009	0.0008	R^2 overall	0.0010

Income continuous variable for the reported income in 2011 NIS; *Wealth owner* indicator variable for donors who reported not having salaried income; *Persistent donor* indicator variable for donors who reported making a donation every year of the panel; significance levels: *** is 0.01, ** is 0.05, and * is 0.10; clustered standard errors in parentheses

5.6 Individual characteristics

Tables 6 and A5 in the Online Appendix present the results of interaction models for the particular effect of terrorism and relevant individual characteristics on philanthropic donations.

5.6.1 Gender and marital status

While no significant differences in terms of average donations between male and female donors, or between married and non-married individuals are evident, the negative and statistically significant coefficients for the interactions variables of terrorism with gender

Table 6 Panel OLS-interactions (gender, marital status and religious minorities)

Individual characteristic:	(1) Female	(2) Non married	(3) Non Jewish (minorities)
Dependent variable: donation (t + 1)			
Terrorism	465.9588** (181.9458)	404.9178*** (150.5942)	324.0212** (136.5874)
Individual characteristic	191.0875 (879.6212)	−636.8552 (533.7754)	−1025.6658*** (327.5939)
Terror × individual characteristic	−608.5972** (262.5222)	−438.3377** (175.2720)	−462.4945*** (148.5613)
Income	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)
Age	752.6581*** (264.2894)	756.5045*** (264.3348)	752.7527*** (264.2929)
Children	480.0833*** (121.9259)	477.9240*** (121.9172)	480.1896*** (121.9087)
Non Jewish	−1191.1262*** (319.4424)	−1179.0521*** (318.7522)	
Non Married	−746.9635 (527.2398)		−749.7325 (528.0621)
Female		23.1777 (825.4249)	18.0906 (825.8400)
Constant	−3607.8204*** (886.2549)	−3597.6372*** (893.0779)	−3566.4800*** (892.2033)
Time FE	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes
N	902996	902996	902996
R^2 overall	0.0008	0.0008	0.0008

Significance levels: *** is 0.01, ** is 0.05, and * is 0.10; clustered standard errors in parentheses

and marital status indicate that terrorism reduces the average contributions of females and of non-married individuals (Table 6, columns 1–2). Psychological theories such as the "role constraint theory" and the "socialization theory" (Rosario et al. 1988), suggest that women may be more emotionally focused and therefore may assume more responsibilities towards their own homes, families and children following a stressful event. Doing so could come at the expense of one's care to the outside community. Accordingly, in the face of terrorism they would become more sensitive to potential income losses and other risks associated with terrorism, becoming less likely to make charitable contributions. Our results support these theories as well as other studies about the link between philanthropy and marital status (Bekkers and Wiepking 2007, 2010).

5.6.2 Minorities (non-Jewish religious affiliation)

In Israel, Arabs are the largest of all religiously based minority groups (about 20 % of the population). Column 3 of Table 6 suggests that minorities on average give less than the

Jewish majority, and under terror attacks they are more likely to reduce their donation contributions even further. As described earlier, stressful events may cause two possibly contradicting behavioral effects: On one hand, conserving resources as a result of expected economic decline and, on the other hand, expressing empathy for victims. The negative and statistically significant coefficient indicates that the Arab minority in Israel, on average, expresses less solidarity with and empathy for the community's distress following terrorism.[28]

5.6.3 Ethnic origins

Israel is often praised as an immigrant country where people of many different ethnicities have assembled together successfully. However, since its establishment, Israel also has experienced conflicts and discrimination based on the different ethnic origins among its Jewish population. While we didn't observe statistically significant differences between donation patterns of those with African, Asian, European or American origins, the results presented in Table A5 in the Online Appendix show that Israeli donors of non-American ethnic origin, on average, donate less than to those of American origin, and on average reduce their giving in response to terrorism.

5.7 Robustness tests

This subsection presents several robustness tests of the baseline analysis presented in Table 3. These tests show that the effect of terrorism on the scope of philanthropic giving is robust to alternative specifications of the main variables of interest as well as to the exclusion of sub-groups of potentially exceptional, or outlier, observations from the data. Table 7 repeats the estimations of Table 2 for alternative measures of terrorism: number of fatalities, number of suicide attacks, number of fatalities as a result of suicide attacks, excluding attacks that occurred in localities beyond the 1967 borders, and excluding attacks that occurred outside of Jewish localities.

For the main models of this study, following the literature, we chose to use the number of terrorist attacks as our terrorism measure. Our preference for a measure of terrorism frequency as opposed to intensity relied on studies that showed that the effect of terrorist attack frequency had more explanatory power than measures of the severity of such acts. Accordingly, persistent terrorist campaigns, whether of high or low severity, generated larger impacts than rare, high-casualty terror events (Pizam and Fleischer 2002). More attacks, regardless of lethality, expose a higher percentage of the population to the stress and anxiety associated with terrorism (Berrebi and Ostwald 2014). Since this study analyzes the effect of sequential terror incidents over a relatively long period of time, using attacks rather than fatalities seems more appropriate. In order to ascertain that our findings are robust to the chosen measure of terrorism, the second column of Table 7 uses *terror fatalities* instead of *terror attacks* as an alternative proxy for the level of terrorism. The former variable is a good proxy for the magnitude of the attacks, and is measured by the number of fatalities resulting from each attack. This measure emphasizes attacks resulting in many fatalities as opposed to those that result in a single or only a few fatalities. According to the terrorism coefficient presented in the fatalities specification of Table 7, a

[28] While our analysis provides insight into religious heterogeneity, Putnam and Campbell (2010) show the additional importance of religiosity on charitable giving. Provided appropriate data, that distinction could be a venue for future directions of inquiry.

Table 7 Panel OLS-terror variable variations

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable: donation (t + 1)						
Terror Variable	Attacks	Fatalities	Suicide Attacks	Suicide fatalities	Attacks	Attacks
Sample	All localities	All localities	All localities	All localities	Localities within 1967 Borders	Jewish localities
Terrorism	320.3414**	74.4032**	1343.4420*	138.4756**	325.3520**	574.4204*
	(136.0330)	(31.1200)	(690.7458)	(68.4663)	(142.1912)	(293.2132)
Income	0.0011	0.0011	0.0011	0.0011	0.0011	0.0006
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0009)	(0.0005)
Age	752.7461***	752.6222***	752.6254***	752.7437***	762.1200***	747.4910**
	(264.2923)	(264.2360)	(264.1743)	(264.1888)	(273.6047)	(354.6369)
Children	480.2579***	480.5267***	480.6815***	480.6741***	505.5956***	460.3036***
	(121.9076)	(121.9167)	(121.9212)	(121.9208)	(136.6169)	(108.5923)
Non Jewish	−1181.6967***	−1181.3865***	−1182.1662***	−1182.1617***	−1202.7497***	−1149.7788***
	(318.9929)	(319.0355)	(319.0292)	(319.0303)	(323.0922)	(408.9832)
Non Married	−749.8174	−750.6824	−751.8458	−751.8770	−760.7939	−693.8568
	(528.0641)	(528.2118)	(528.4489)	(528.4467)	(570.7712)	(639.7317)
Female	18.4118	18.9873	19.6134	19.5821	−6.1617	597.5932
	(825.8353)	(825.9109)	(826.0505)	(826.0423)	(893.9796)	(1345.7942)
Constant	−3566.7916***	−3594.1100***	−3620.1078***	−3618.8362***	−3676.2228***	−3300.2616***
	(892.2067)	(897.8331)	(902.0746)	(901.6144)	(962.7114)	(1053.3573)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes
N	902,996	902,996	902,996	902,996	834,388	783,930
R^2 overall	0.0008	0.0008	0.0008	0.0008	0.0008	0.0007

Jewish localities are defined as localities in which the Jewish population is 80 % or more; Total of 246 localities, 164 of them are Jewish localities

Significance levels: *** is 0.01, ** is 0.05, and * is 0.10; clustered standard errors in parentheses

one standard deviation increase in terror fatalities increases the average annual donations by 8156 NIS* (about $2300). This estimate is comparable to the one obtained when using attacks to measure terrorism, since during the sample period the average number of fatalities per attack was approximately 2.6. The results remain statistically significant in both models.

In the third and fourth columns of Table 7, we focus on the effects of suicide attacks and fatalities from suicide attacks on philanthropy. It is possible that some types of terrorist attacks create greater stress and fear amongst the population and generate a different, potentially stronger, behavioral effect. Suicide attacks perpetrated during the sample period were the most lethal of all attack methods. They caused both the largest number of casualties in absolute terms as well as in relative terms measured by the number of fatalities per attack. Suicide attacks also drew significant public and media attention. Our analyses show that when focusing on suicide terrorism, the coefficients' magnitudes are about four times larger than for other types of attacks, and they remain statistically significant.

It is important to test whether our results might be biased because of attacks that occurred in areas beyond Israel's 1967 borders, or localities with particular ethnic and religious characteristics. Column 5 looks at the effect of terror attacks excluding localities in the territories occupied in 1967. Those localities are geographically located in places characterized by greater friction with neighboring Palestinian populations, and donors in these localities might react differently to terrorism. Clearly, the resulting coefficients suggest that our main findings are not driven by these potentially exceptional observations. Similarly, column 6 presents the effect of terror attacks when non-Jewish localities are excluded. Jewish localities are defined as those in which the share of the Jewish population is at least 80 %. Excluding non-Jewish localities is likely to exclude non-Jewish donors, who might be less sensitive to the plight created by terrorist attacks against Israeli targets and, hence, the effects of terrorism on the majority of donors might on average be attenuated. In fact, the estimated coefficient on terrorism in this specification is almost twice as large as the one reported in our basic model specification. In both models the main effect remains positive and statistically significant and all other covariates show effects quantitatively similar to the ones reported in our main model.

The most obvious variable used to measure philanthropy is the amount of money donated (in real terms). However, in order to refute any possibility of biases in our results owing to the selection of the donations measure and in order to increase the confidence in our results, we performed several robustness tests using alternative definitions of the dependent variable. Table A6 in the Online Appendix presents results. The different definitions include donations in nominal terms, donations as a share of GDP per capita, donations per household size, the change in donation amount from the previous year, and the accrued donation amount in the following two years. These variations provide alternative standardizations of the reported charitable contributions. Across all variations, the results show a consistent, positive and statistically significant relationship between terrorism and charitable giving.

6 Conclusions

This paper has assessed empirically the effect of terrorism on the scope of giving by individual donors in Israel. The evidence suggests that terrorism has a positive and statistically significant effect on charitable giving. The findings are robust across a multitude

of model specifications, different measures of terrorism as well as different measures of donations. Furthermore, we employed an instrumental variable approach to identify a causal link and address potential endogeneity concerns. Our robustness tests reinforce certainty in the causal findings of an effect of terrorism on philanthropic donations. Donor's age, number of children and the religious affiliation of the majority group (Jewish) were found to be positive and statistically significant factors as well. We show that while higher income individuals donate more, terrorism reduces their willingness to donate. However, for wealthier donors who do not depend on income from employment, both larger average annual donations and increases in contributions following terrorism were recorded. While we did not find statistically significant differences in charitable contributions based on gender or marital status, we did find that females and non-married donors tend to reduce their average donations in response to terrorist events. Religious minorities (non-Jewish) and Israelis of Asian, African, and European ethnic origin (i.e., non-American origins) donate less on average, and reduce their giving further in response to terrorism. The members of the groups that reduce their average donations following terrorist attacks are either more likely to be sensitive to terrorist-related economic risks, or less likely to feel empathy for or solidarity with the victims.

In terms of combating terrorism and alleviating distress in the aftermath of terrorist attacks, it is important not to ignore the willingness of philanthropists to step into fill the immediate needs, in particular in those places where governmental responses tend to be too slow or too bureaucratically cumbersome.

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