

Major Life Changing Events and Prosocial Behavior:

Terrorism, Mass shootings, Natural disasters, Immigration and Philanthropy

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This work was carried out under the supervision of Professor Claude Berrebi.

Abstract

Philanthropy is a significant phenomenon that has a substantial impact on the economy and policy worldwide. Its importance to society is well documented, as it expresses the relationship between individuals and society, individuals' solidarity with their community, expressing and supporting individuals' values, and more. While there has been a great deal of academic literature written about the socio-economics determinants of philanthropy, the impact of extreme traumatic events on philanthropic behavior has been rarely explored.

Throughout life, individuals experience a plethora of events, some of their own choosing and some forced upon them externally. This thesis empirically analyzes various aspects of behavioral reactions to traumatic stress events: Terrorism, Mass Shootings, and Natural Disasters which are external punctuated events, and Immigration which is a life changing choice that lasts over a relatively long period of assimilation process. Theories predict that behavioral reactions to these events may be displayed in different ways. While some individuals react by holding back on their financial activities following stressful events, others may express more generosity by increasing their giving.

The studies included in this thesis utilize longitudinal data with multiple treatment periods and differing treatment intensities across time and space in a fixed effects approach, over a relatively long period of time. This approach allows us to statistically investigate the variation in philanthropic behavior across communities and individuals (treatment group) in comparison with other non-affected communities and individuals not subjected to these events (control group) across time, while controlling for other economic, demographic and political determinants of prosocial behavior. The first three chapters investigate the effect of natural disasters, terror attacks, and mass shootings on prosocial and antisocial behavior of individuals and communities through charitable giving, and the fourth chapter examines the relationship between immigration and the assimilation process, and philanthropic behavior.

The first chapter (coauthored with Claude Berrebi and Ariel Karlinsky) investigates the behavioral response of people and communities to natural disaster catastrophes. A

natural disaster is a type of external, quasi-random and unexpected catastrophic shock that carries psychological, social and economic implications. Using detailed county level administrative data of charitable contributions and natural hazards in the U.S. in the recent decade, we empirically identify and quantify the causal effect of natural disasters on prosocial and antisocial behavioral reactions.

The results presented in this chapter show that while monetary contributions decline in the local affected community in the aftermath of natural disasters, the neighboring and more distant communities react by increasing their charitable giving. Furthermore, we find evidence of a crowding-out effect of monetary contributions due to government aid to the affected communities. Interestingly, in spite of frequent reports by the media and social networks about looting and other crimes in the aftermath of natural disasters, our analyses show that, on the contrary, crime rate is negatively associated with natural disasters in the victimized communities in the United States.

In the second chapter (coauthored with Claude Berrebi) we use a longitudinal analysis of the Israeli-Palestinian conflict as a case study to uncover the relationship between terrorism and philanthropic behavior. Our empirical approach relies on a unique panel dataset of the entire population of tax itemizer donors in Israel (152,731 individuals and households) from 1999 to 2011, and detailed terrorism data for the respective period. Terrorism is exogenous to donors' contributions and its' standard determinant. This allows us to study the causal effect of terror attacks by using the potential changes in giving patterns by individual donors 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. Furthermore, we use a novel instrumental variable approach to identify a causal link and to address remaining potential endogeneity concerns.

The study's results show that overall, terror attacks increase considerably the scope of giving by individuals and households. However, we also find different philanthropic responses across social-demographic characteristics such as gender, minority status and ethnic origin.

The third chapter (coauthored with Claude Berrebi) explores the relationship between mass shootings and prosocial and antisocial behavior of individuals and

households in the United States. The recent decade has seen a noticeable spike in mass shootings and unlike other types of deadly crimes such as homicides, robberies or burglaries, most mass shootings are intended to kill as many random individuals as possible with whom the predator usually has no direct specific conflict. Although these events are relatively rare, they receive unproportionally frequent and sensational media coverage compared to other deadly events, thus amplifying their effect. We use data on charitable contributions, criminal activity and mass shootings in the U.S. from 2004 until 2015 to identify and quantify the relationship between mass shootings and prosocial and antisocial behavior.

We show that charitable contributions increase in the affected states following mass shooting events. However, this effect is not consistent within the state, so that in the counties where mass shootings occurred, we observe a decrease in charitable contributions, possibly due to blame that is attributed to the victims and the affected community. Moreover, testing for various criminal activities, we find other types of crime to be unrelated to charitable giving. We show that mass shootings are different than any other criminal behavior, including all other violent offenses, in terms of its effect on prosocial and antisocial behavior.

The last chapter focuses on the relationship between immigration, assimilation, and philanthropic behavior. The heterogeneity of the Israeli population and the special characteristics and diversity of Israeli society, which include migration from both wealthy and poor countries, allow for a unique opportunity to study the relationship between immigration and prosocial behavior. The methodology used in this study is based on the analysis of a unique panel dataset of the entire population of tax itemizer donors in Israel between 1999-2011, similar to the one used in chapter 2. The identification strategy relies on the variation in charitable giving between immigrants and natives, and the gradual assimilation process that immigrants experience in the host country.

The findings of this study suggest that recent immigrant philanthropists in Israel contribute significantly higher amounts than their native-born counterparts and veteran immigrants. These results differ from most of the literature on immigration and philanthropy and offer new ways to study the intersection of these issues. These unique results could be related to the relatively high share of highly skilled immigrant donors

originating from wealthy countries, mainly from the United States. However, with each year residing in Israel, assimilating and integrating into its society, their giving patterns decrease, converging to the level of native-born donors.

A Letter of Contribution

This thesis is the product of independent research conducted by Hanan Yonah.

All chapters were written by Hanan Yonah, who is the main author of chapters 1-3, and the sole author of chapter 4. His contribution includes research planning and conception, theoretical background, literature review, collection of data, methodology implementation, econometric analyses, interpretation of the research and writing.

Professor Claude Berrebi coauthored chapters 1-3. He contributed to the formulation of the research questions and agenda, advised on the methodology design and its implementation, as well as the interpretation of the empirical results, and critically supervised the research and the manuscript.

Mr. Ariel Karlinsky coauthored chapter 1. His main contribution was collecting the data and performing computer data programming (Stata). He also provided valuable comments which improved the empirical analyses of the research.

Introduction

In this research I investigate the relationship between significant stressors and prosocial behavior. Four types of extreme traumatic events are of particular interest due to either their relative unpredictability, exogeneity, or their temporal and spatial reoccurrences and variations: terror attacks, mass shootings, natural disasters and immigration. These events exert a physical, emotional and economic toll, and their impact is far beyond the immediate individuals involved and the surrounding communities. Changes in charitable giving patterns and crime rates are used as a measure for prosocial and antisocial behavior of individuals, households and communities, as a response to extreme events.

Terrorism, mass shootings and natural disasters are external punctuated events. For most of the population these events will be conveyed through the frequent and often sensational media coverage which distributes and amplifies its impact on the exposed population, and heavily influences the public's perception (Shultz et al., 2014). These traumatic events differ from each other in many aspects, and the impact on individuals, households and communities who were exposed to these events may vary accordingly. Unlike natural disasters, terrorism and mass shootings are intentional human-made acts, which in most cases are premeditated and involve preparation and planning by the aggressors. In many developed Western countries terrorism is perceived as an external threat on the majority population or even on the entire victimized nation, while in many of the mass shooting events the predator emerged from within the (affected) community. Immigration represents a different type of extreme life changing event. Unlike the previous punctuated type of events, immigration is a life changing choice that involves a relatively long period of assimilation process and has an impact on both the immigrants and the host community. The process of migration is usually psychologically stressful, and in many cases, can be traumatic, even in positive circumstances (Lopez, 2012).

The academic literature relating extreme events and prosocial behavior typically have investigated single case studies, and most research on this topic has 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). As of now, the literature lacks contemporary longitudinal analyses that could be used to study changes in prosocial

behavior associated with extreme events. With respect to immigration, unlike previous studies which focused mainly on migration from developing countries to Western developed countries, this research provides an opportunity to uncover changes in giving patterns by highly skilled immigrants originating from wealthy countries.

This research is intended to improve our knowledge and understanding of prosocial and antisocial behavior following stressful events and similar catastrophes. Beyond its academic contribution, the findings and insights of this research will allow us to better advise policy makers, professionals and organizations who deal with recovery of individuals and communities post traumatic events. This study will also contribute to our understanding of both theoretical and policy related aspects of immigrant assimilation and bring to light new insights on the role that social identity and cultural origins can play in shaping patterns of charitable giving.

This thesis and its findings represent a key step in the systemic evaluation of the effects of many types of extreme traumatic events on prosocial and antisocial behavior.

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Contents

Chapter 1- Individual and Community Behavioral Responses to Natural Disasters

1.	Introduction	5
2.	Theory and Conceptual Framework	7
3.	Related Literature	9
4.	Data	11
5.	Empirical Strategy	12
6.	Empirical Results	14
7.	Conclusions	24
8.	Tables	27

Chapter 2 - Terror and Philanthropy

1.	Introduction	41
2.	Background and Theoretical Framework	44
3.	Data	46
4.	Methodology	49
5.	Empirical Results	53
6.	Conclusions	61
7.	Tables	63
8.	Appendix	71

Chapter 3 - Crime and Philanthropy: Antisocial and Prosocial Responses to Mass Shootings

1.	Introduction	87
2.	Theory and Conceptual Framework	89
3.	Data and Empirical framework	93
4.	Empirical Strategy	94
5.	Empirical Results	96
6.	Robustness and Falsifications	107
7.	Conclusions and Discussion	107
8.	Tables	111

Chapter 4 - Immigration, assimilation and philanthropy: A longitudinal study

1.	Introduction	125
2.	Theory and Conceptual Framework	126
3.	Related Literature	128
4.	Data	129
5.	Methodology	131
6.	Empirical Results	133
7.	Conclusions	140
8.	Figures and Tables	143

Discussion and Conclusions	153
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References	157
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Chapter 1 – Individual and Community Behavioral Responses to Natural Disasters

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Individual and Community Behavioral Responses to Natural Disasters

Abstract

How do people and communities respond to catastrophes? A natural disaster is a type of external, quasi-random and unexpected catastrophic shock that generates psychological, social and economic implications. Using detailed county level administrative data of charitable contributions, crime and natural hazards in the U.S. in the recent decade, we empirically identify and quantify the causal effect of natural disasters on prosocial and antisocial behavioral reactions.

Our main finding is that while monetary contributions decline in the local affected community in the aftermath of natural disasters, the neighboring and more distant communities react by increasing their charitable giving. Additionally, we find that in the affected community, natural disasters effect crime negatively, dispelling popular conceptions regarding looting, and that while federal assistance crowds out charitable contributions, it does not change the residents' reaction to natural disasters.

1. Introduction

Between 2004 and 2015, over 10,000 natural disasters of different intensities occurred in the United States and claimed more than 8,300 lives, caused more than 46,500 injuries and created property damages estimated at more than 100 billion dollars (in 2015 dollars). Natural disasters, like mass shootings and terror attacks (i.e. extreme stress events), are a type of external, random and unpredictable shock that have a psychological, social and economic impact, generating fear and stress. Natural disasters often occur in a geographically constricted area and claim a physical price that creates an emotional shock and economic instability among individuals who are exposed to the traumatic event.¹ Following natural disasters, many regions face substantial loss of wealth, infrastructure, physical and ecosystem damages that affect local administration, governmental and public institutions, as well as individuals and household units. The shock and stress created by these events may affect the social behavior within, as well as outside, the affected community (Belasen and Polachek 2009; Berrebi and Yonah 2016; Bonanno et al. 2007; Schlenger et al. 2002; Schuster, M. A. et al. 2001; Silver et al. 2002; Spencer et al. 2016).

The relatively high rate of casualties and damages associated with natural disasters demands responses beyond that which are typically supplied by the government, which might also be slow to react (Shughart, 2006). This gap is partially filled by both individuals and nonprofit organizations dealing with the consequences of these events and their related aspects. For the most part, the aid organizations rely on contributions (such as support for victims, physical and post-trauma rehabilitation, and compensation for the loss of income and infrastructure). Behavioral reaction to traumatic events may not be restricted to providing aid to the victims and the affected communities but could potentially have a broader impact on prosocial and antisocial behavior as a whole, including people's attitude toward philanthropy, as we show in the theory and conceptual framework section.

Evidence tends to show that looting and antisocial behavior are relatively rare phenomena in American disasters (Barsky et al., 2006). Studies repeatedly show that the social effect immediately following a disaster is usually demonstrated by cooperation within the

¹ A traumatic event is defined by its capacity to evoke terror, fear, helplessness, or horror in the face of a threat to life or a serious injury (American Psychiatric Association, 1994. *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC).

community and social solidarity (Dacy and Kunreuther, 1969; De Alessi, 1967; Douty, 1972). On the other hand, in the aftermath of a more recent disaster caused by Hurricane Katrina, a number of media reports made references to looting that emerged from New Orleans and the surrounding heavily impacted areas. Statistics obtained on looting showed that 237 reports of arrests had been made in New Orleans in the month following the disaster (Barsky et al., 2006). Nevertheless, long-standing assertions in sociological literature on disasters portray widespread looting as a myth, and Tierney et al. (2006) argued that these reports were greatly exaggerated by the media.

The behavioral reaction to disasters is not restricted to the affected region only. The associated media coverage distributes and amplifies its impact far beyond the immediate victims and the surrounding community. The media coverage of disasters was found to have a large impact on donations to relief agencies (Brown and Minty, 2008). Gifts of resources to victims of disasters are common, and charity from individuals outside the affected community and within the community are well documented.² Moreover, several institutions (e.g., the Red Cross, Salvation Army, etc.) exist specifically for the purpose of facilitating such charity. Interestingly, no dramatic rise in prices was recorded in disaster zones, as one might have expected due to the scarcity of available resources. On the contrary, the price of essential goods in some cases shortly declined, and shelter and food were offered to the victims for free or below market price (Dacy and Kunreuther, 1969; De Alessi, 1967). The cooperation and generally selfless acts by victims and others nearby is strikingly evident (Douty, 1972; Hirshleifer, 1983; Samuels and Puro, 1991; Lindell and Prater, 2003; Cavallo et al., 2014).

This study aims to identify and quantify the relationship between natural disasters and philanthropic behavior, towards all charitable causes, of households and individuals in the United States. While many studies of natural disasters focused on the physical and psychological effect on the victims and the disruptions of the community life, we focus on the effect of natural disasters on donations in both local and broader distance communities.³

² In certain cases the deterioration of wealth and its effect on the affected community is so great as to yield a decrease in charity within the community affected (De Alessi, 1967).

³ We refer to philanthropic donations as monetary donations to qualified organizations in the U.S. by individuals who itemize deductions.

Using longitudinal data with multiple treatment periods and differing treatment intensities across time and space in a fixed effects approach, we analyze natural disasters by date, geographic location, category, magnitude and other characteristics, along with data about charitable giving to nonprofit organizations following these events.

The goal of this research is to contribute to a growing body of literature on philanthropy that addresses the willingness of people to make contributions, and to improve our knowledge and understanding of pro and antisocial behavior following catastrophes and specifically natural disasters. Beyond its academic contribution, the findings and insights of this research will allow us to better advise policy makers, professionals and organizations who deal with recovery of individuals and communities following traumatic events. Previous research either studied a single case such as hurricane Katrina (Chamlee-Wright and Storr, 2010; Shughart, 2006), or focused on the recipient organizations which received contributions (Pena et al., 2014). The analysis herein is, to the best of our knowledge, the first attempt to empirically use spatial and temporal variations to systematically investigate the effects of natural disasters on prosocial and antisocial behavior, and specifically on philanthropy, in multiple comparative settings beyond the immediately affected community, over a relatively long period.

2. Theory and Conceptual Framework

Traumatic events trigger a wide variety of behavioral responses. While some individuals react by holding back on their financial activity (including charitable giving) following stressful events, others may express more generosity by increasing their giving due to solidarity and empathy with the victims. To explain the potentially feasible range of behavioral outcomes expected following natural disasters, we rely on two classes of theories: the Social Support Model, which may predict increases in charitable giving following natural disaster events, and the Stress Theory and the Conservation of Resources model (COR), which may predict a decline in giving.

The Social Support Model aims to explain social and psychological behavior in the immediate post disaster period (Barrera, 1998; Kaniasty, 2012). Natural disasters elicit an outpouring of immense mutual help where immediately after the impact, communities of victims, professional supporters, and empathetic witnesses rally to rescue, protect, and assist

each other (Kaniasty, 2012). This model suggests that a high level of social support counteracts and mitigates the negative social and psychological effects of potentially traumatic and stressful events. According to both theories people would potentially increase their charitable giving due to heightened feelings of compassion and empathy towards their fellow men and women.

The Stress Theory describes the cause of psychological stress in the context of a relationship between the individual and the environment, which is perceived as threatening his or her resources and endangering his or her well-being (Lazarus and Folkman, 1984). Lazarus and Folkman discuss the “concept of vulnerability” as related to adequacy of resources. 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 the COR model (Hobfoll, 1989), resources include both material and psychological resources, and a potential or actual loss of these resources results in stress. In such cases, people strive to protect their resources, including holding back on their charitable giving activity.

Economists and social scientists who have studied disasters assert that the classical economic theory fails to explain why prices fail to rise post disaster in the disaster region, as would be suggested by simple supply and demand analysis.⁴ The marginal utility of gifting theory suggests that disasters introduce short-run structural changes in individuals’ utility function toward greater charity (De Alessi, 1967; Dacy & Kunreuther, 1969). In the aftermath of a natural disaster, the wealth and the welfare of some individuals within the affected community decrease. Assuming that individuals derive utility from increasing the welfare of others (warm glow), a gift of a dollar yields more utility to a donor after a disaster than before. According to economic theory, individuals will increase their charity gifts until, at the margin, equilibrium conditions are restored.

Based on the mechanisms and the theories described above, we would expect a complex behavioral reaction by individuals as a response to the stress generated by natural disasters. Theory alone does not provide a definitive behavioral prediction, as the effect of natural disasters on charitable giving is theoretically ambiguous and needs to be determined

⁴ The classic economic theory would suggest that shortage in supply of goods would lead to an increase in prices, given demand remains the same.

empirically.

3. Related Literature

Many disaster studies examine the effects of a particular event, that when combined can be described as a series of case studies. Early mainstream sociological studies showed that extreme events enhance social cohesiveness and result in an emergence of strong altruistic norms in the immediate aftermath of natural disasters. They indicated that stress caused immediately following a natural disaster generates consensus regarding life values, solidarity, community and prosocial behavior, while disagreements and conflicts are suspended (Barton, 1969; Dynes and Quarantelli, 1971; Dynes, 1970; Fischer, 1998; Quarantelli and Dynes, 1985; Tierney, 2001). Several scholars described this phenomenon as “post-disaster utopia”, “altruistic community phase”, or “post-crisis benevolence” (Erikson, 1976; Kaniasty and Norris, 2004). These studies and others provide considerable evidence that social bonds are produced or enhanced during disasters and that altruism plays an important role (Barton, 1969; Drabek and Key, 1986).

On the other hand, recent studies have challenged the prosocial concept, presenting conflicting results. Tilcsik and Marquis (2013), in a study examining the effect of mega human-made and natural disasters on philanthropic spending of *Fortune* 1000 firms between 1980 and 2006, linked the effect to the magnitude of the event. A negative effect was found in the case of highly destructive disasters which offset the altruistic mechanism. In the event of a severe natural disaster, significant physical and economic damage is caused which may limit the philanthropic capacity of local firms, who may be more preoccupied with the impact of the disaster on their own operations.⁵ Furthermore, major disasters may compromise not only the philanthropic capacity of the firms, but also the overall philanthropic infrastructure of the community and the individuals, as was the case during Hurricane Katrina (Muller and Kräussl, 2011; Tilcsik and Marquis, 2013). However, charitable giving by individuals differs from corporate philanthropy in many ways. The motivation of a firm to donate is influenced by unique exogenous considerations such as the stock exchange market trends, corporate

⁵ Loayza et al. (2012) argue this notion. They conclude that disasters do affect economic growth, but not always negatively, with effects that differ across types of disasters, economic sectors and developing and developed countries. A meta-analysis study by Lazzaroni and Bergeijk (2014) indicates that disasters have a negative impact in average in terms of direct costs.

social responsibility policy, reputation, publicity and advertisement, and investor relations. Therefore, these studies may be less relevant to our purpose. Taylor (1976) in his research on the Xenia tornado in 1974, found that both stress and positive reactions were evoked among the exposed population. Erikson (1976) showed that survivors experienced a sense of loss of communality and connection, based on a study of the Buffalo Creek dam break which took place in 1972. Later studies on Hurricane Katrina show conflicting results regarding looting in the impacted areas (Barsky et al., 2006; Tierney et al., 2006). Pena et al. (2014), using linear, dynamic panel-data, studied the effect of natural disasters on U.S. nonprofit organizations' net assets and revenue.⁶ Although positive effects of disaster events on nonprofit activity were examined, the extent to which this relates to charitable giving by private donors, as opposed to firms and governmental sources (who may increase funding to certain charities) remains a question of interest.

Due to the tendency to study single events, the current literature lacks contemporary longitudinal analyses that could be used to study changes in philanthropic behavior associated with natural disasters. Research on other types of traumatic events, such as terrorist attacks and mass shootings, shows that the psychological effects are not limited to the direct victims and communities. Accordingly, residents near the afflicted communities and even those living far away can be affected (Berrebi and Yonah, 2016; Bonanno et al., 2007; Schlenger et al., 2002; Schuster et al., 2001; Silver et al., 2002). Psychological proximity was the main factor associated with stress reactions in the general population (Shultz et al., 2014), and collective traumas following such events have been observed to have public health effects, particularly with respect to stress-related symptoms (Holman et al., 2014). It is therefore valuable to further evaluate the spatial impact of natural disasters in relation to prosocial and particularly philanthropic behavior.

Based on the conceptual framework and the literature review, we address the following questions: What is the relationship between natural disasters and charitable giving? Do we observe different responses based on the type and source of disaster? Is the relationship between natural disasters and donations dependent on socio-demographic characteristics? Is the formal government (and welfare institutions) response to natural disasters crowding out

⁶ Nonprofits' net assets and revenue found to be positively correlated with disaster event damage levels.

private philanthropy? Can natural disasters have an opposing effect based on the proximity to the incident? What is the magnitude, if any, of crime and antisocial behavior sparked by natural disasters? Can repeated natural disasters shape the collective prosocial attitudes?

4. Data

To analyze the relationship between natural disasters and philanthropy in the United States, we constructed a panel dataset consisting of charitable contributions of household and individual tax itemizers, at a county level, for each year from 2004 to 2015, and combined it with supplementary economic and demographic information at the county level. This donor information was merged with natural disasters data for the respective period.

4.1. Philanthropy data

The data about philanthropy in the United States was retrieved from the IRS Statistics of Income (SOI) division.⁷ The data is based on the annual tax returns submitted by U.S. citizens, at the zip code level aggregated at the county level.⁸ The data contains, for each county, detailed information including, but not limited to, the adjusted gross income of all individuals and households who itemize deductions, the number of itemized returns reporting contributions, and the amount of charitable contributions made to qualified organizations, as reported to the IRS.⁹

4.2. Natural disasters data

Natural disasters data was obtained from the Storm Events Database of the National Centers for Environmental Information (NOAA).¹⁰ Contrary to its name, this database includes not only storms but all other significant weather events (“...storms and other significant weather phenomena that have sufficient intensity to cause loss of life, injuries, significant property damage and/or disruption of commerce; rare and unusual weather phenomena that generate media attention; other significant meteorological events such as record maximum or

⁷ <https://www.irs.gov/statistics/soi-tax-stats-individual-income-tax-statistics-zip-code-data-soi>

⁸ We followed SOI’s recommendations and instructions to aggregate the data to the county level.

⁹ Form 1040, Schedule A

¹⁰ <https://www.ncdc.noaa.gov/stormevents/>

minimum temperatures...”). Each observation in this dataset is a natural hazard event and each listing provides detailed information for every hazard, including date, location, number of individuals killed or injured and property damage caused by the event. We define natural disasters as natural hazards which have caused at least one casualty.

Other county level variables included in our analysis were chosen based on the theories and mechanisms described above and are the adjusted gross income (*AGI*) of all individuals and households who submitted tax returns (retrieved from the SOI); the number of residents (*Population*), share of residents below the poverty line (% *Poor*) and *Unemployment rate* as reported by the Bureau of Labor Statistics; the number of adults holding a *BA* (or equivalent) degree or higher, as reported by the Census Bureau; *Republican* is an indicator variable which equals 1 if the majority of the county’s residents voted for the republican presidential candidate in the most recent relevant elections.

Table 1 presents a summary of households’ charitable contributions, natural disasters’ statistics as well as other county characteristics in our sample, over the period 2004 to 2015. County’s average annual contributions was a little over 59 million dollars and the mean adjusted gross income was almost 3 billion dollars.¹¹ During the sample period (2004-2015), over 10,000 natural disasters of different intensities occurred in the United States and have claimed more than 8,300 lives, caused more than 46,500 injuries and created property damages estimated at more than 100 billion dollars.

Our main variable of interest is the number of natural disasters within each county. Our analysis includes all 3,134 counties and county equivalents in the mainland United States. In the next section we further analyze the relationship between natural disasters and philanthropy using econometric multivariate panel regression models in order to better identify this relationship.

5. Empirical Strategy

To study the relationship between natural disasters and the scope of giving we use the spatial and temporal variation in philanthropic contributions and natural disasters within and across U.S. counties in a comparative setting. This approach allows us to statistically investigate

¹¹ All monetary variables are indexed by the CPI to 2015 dollars.

the variation in philanthropy in disaster stricken counties (treatment group) in comparison with other non-affected counties (control group) across time, while controlling for other relevant economic, demographic and political variables, and while controlling for the county's and period's particularities. Our main empirical strategy (discussed below) utilizes lags of explanatory variables in order to ascertain the chronological order of events. Accordingly, philanthropic donations in any given year are explained via natural disaster events in the preceding year (and controlled for with covariates of that preceding year).¹² Formally, our main Panel Fixed Effects model specification is:

$$D_{it+1} = \alpha ND_{it} + \beta \sum ND_{i \neq jt \mid r \leq 3000} + \gamma X_{it} + \mu_i + \tau_t + \epsilon_{it+1}$$

Where:

D_{it+1} is the scope of giving by all philanthropists in county i in year $t+1$. ND_{it} is the number of natural disasters in county i at year t . $ND_{i \neq jt \mid r \leq 3000}$ is the number of natural disasters in counties bordering or nearing county i within a radius of up to 3000 km. X_{it} is a vector of socio-economic, demographic, and political control variables that vary across time and space. μ_i is a geographical fixed effect unique to county i , and τ_t is a year fixed effect.

Accordingly, our main coefficients of interest are α and β . While α is the coefficient for the direct effect of natural disasters on the locally affected community, the β coefficient allows us to test the effect of natural disasters that occur outside the local community, on charitable giving. Ideally, we would have estimated a model in which β captures the effect of all natural disasters which occur at year t outside county i , yet this is technically impossible as it would be collinear with the time fixed effects. Therefore, limiting the radius and aggregating events to a distance of 3000 KM from the affected county, solves the collinearity problem while keeping the basic approach that allows us to estimate the effect of natural disasters on philanthropy in counties outside of the victim county.¹³ Standard errors are clustered at the county level, as this is the level in which treatment of natural disaster events are applied (Abadie et al., 2017).

¹² A contemporaneous model was estimated as well, yielding virtually identical results, and is available upon request from the authors

¹³ This approach is practical as more than 95% of counties are located at a distance of up to 3,000 KM from each other.

In order to achieve a valid causal estimate of α and β , natural disasters must be exogenous to charitable contributions. Naturally, as these events are caused by “nature”, they are clearly exogenous. However, their effect might not be. An earthquake might cause much more damage in a low-income county than in a high-income one, as allegedly high-income counties are better equipped with institutions, building quality and emergency services that deal with such occurrences. It could be argued that such factors are independent of natural disasters within the United States, as all counties have similar building regulations and emergency services. In order to account for variation within the U.S. in such factors, we include county fixed effects which control for inter-county variance.

Since our data is aggregated at the county level, it is subject to the “ecological fallacy” risk. The mean charitable contribution in a county does not represent the actual distribution of monetary donations by each or some representative individuals or households. However, counties are relatively small units and are homogeneous on several dimensions, such as culture, economic activity, religiosity and political division. Analyzing the relationship between natural disasters and charitable giving at the county level allows us to better analyze factors for which differences are only indicative at the county level. Although it is impossible to completely eliminate the “ecological fallacy” concern, we alleviate it by running several robustness checks such as analyzing the relationship between natural disasters and charitable giving based on different variations of the dependent and the explanatory variables. It should also be noted that our main focus in this study is on the average national level phenomena and not on the effect of natural disasters on any particular group or individual.

6. Empirical Results

6.1. Main specification

Table 2 reports the results for our baseline model in which we estimate the effect of lagged natural disaster events on the scope of charitable giving by U.S. donors. The first and the second rows present the coefficients for the effect of natural disasters on the scope of charitable giving (within the affected county and outside respectively) which are our main variables of interest. We use our longitudinal data to exploit both spatial and temporal variations, as well as to include year and county fixed effects, to further reinforce evidence of a link between the severity of natural disasters and philanthropy.

The first row of Table 2 shows the coefficient for the effect of natural disasters within the affected county, while the second row presents the coefficient for this effect in all other counties in the range of up to 3,000 km radius from the affected county. Our preferred specification is presented in column 8 and includes the full set of explanatory variables. The results presented in the table are statistically significant and support the hypothesis that natural disasters negatively affect philanthropy within the affected county, while positively affect philanthropic behavior in neighboring and distant counties. Thus, an additional natural disaster event is associated with a mean decrease of 1.96 million USD in charitable contributions in the affected county in the following year. To put this result into perspective, 1,327 natural disaster events occurred in the United States in 2011, an increase of 210 events from the previous year. According to our model this translates to a reduction of 411.5 million USD in the annual total contributions in all directly affected counties. The average yearly number of natural disaster events between 2004-2015 is 900, thus the mean total annual effect of natural disasters on charitable contributions in all directly affected counties is a reduction of approximately 1.7 billion USD.

In order to compute the total effect of natural disasters on charitable giving, recall that the mean county's natural disaster is 0.29 (Table 1), while the mean total disasters in the neighboring and surrounding counties (not including the directly affected counties) is 848.3 (not presented in the table). Thus, the total effect on a national scale is \$95,713K ($= -1,959.6 \times 0.29 + 113.5 \times 848.3$). Hence, the total effect of natural disasters on charitable giving in all counties translates to an increase of 95.7 million USD in donation on average.¹⁴

These findings show that the local community reacts differently to natural disasters when compared to the surrounding communities, by reducing charitable contributions. Theory suggests that when one's resources are at jeopardy, she or he will strive to protect and conserve their resources (COR model) which includes financial resources. Empathy tends to diminish and a decrease of prosocial behavior becomes plausible.

Considering the other covariates, we see that as expected, income is positively related to charitable giving and the scope of giving increases as counties' Adjusted Gross Income is higher, and counties with higher shares of unemployment are negatively associated with

¹⁴ This is an approximation, as each county is also the neighbor of its neighbors. The spatial econometrics literature shows that our approach is a reasonable approximation (Elhorst, 2014).

giving. These findings are in line with previous literature about philanthropy (Bekkers and Wiepking, 2007). Interestingly, the predicted covariate for the education variable (*BA or higher (%)*) is found to be negative, suggesting that county's average contribution decreases as the share of higher education in the county increases. We measure educational attainment at the county level by using the percentage of the population with college degrees or higher. However, since our data is aggregated at the county level, one should be careful when interpreting this finding, as our dependent variable does not represent the scope of giving by an individual, but rather the county's average contribution in a given year.¹⁵

The political affiliation variable "*Republican*" in our main specification model represents counties where the majority of voters voted for a Republican candidate in the most recent presidential election. The political affiliation coefficient is statistically insignificant, suggesting that on average, after controlling for other covariates, there is no statistically significant relationship between political preferences at the county level and charitable giving.

6.2. Crime

As described in the theoretical section, catastrophic events may evoke solidarity and empathy towards the victims, but also might result in a decline in prosocial behavior. Moreover, the chaos and vulnerability of social structure, institutions and governance might incite an antisocial response. In the wake of natural disasters, reports about looting and other types of crime are often spread through the media and social networks, for example: "It's a burglars paradise" a policeman was quoted in the New York Times after hurricane Sandy (2012). In this section we investigate the relationship between natural disasters and antisocial behavior in the affected county. Table 3 presents six different models to test the effect of natural disasters on various types of crimes, thus in each model we use a different crime indicator as our dependent variable. The information about the number and type of crime is collected and reported by the FBI at the county level in its annual publication - Uniform

¹⁵ For example, an ecological fallacy could occur if highly educated individuals increase their donations, but at the same time counties with a higher share of highly educated people also tend to suffer from more severe economic downturn than those with lower education pulling the average contribution down. If that were the case the decrease in contributions in these counties should not be attributed to the highly educated individuals.

Crime Reporting Program (UCR). The dependent variable in model 1 includes all types of criminal acts, while models 2 and 3 are restricted to violent and property crimes respectively.¹⁶ In order to ascertain the chronological order of events, all the explanatory variables are lagged, thus ensuring that natural disasters occur before the criminal acts. However, the effect of natural disasters on crime could be immediate and transitory. In order to test this, models 4-6 repeat the analysis in models 1-3, but with contemporaneous explanatory and dependent variables.

Our results show that crime rate is negatively associated with natural disasters in the victimized county. In all our models, the coefficient of natural disasters in the county are negative, indicating, if anything, a decrease in criminal activity in the aftermath of disasters. These results do not depend on the type of crime analyzed and hold true for crime altogether as well as violent and property crimes separately. A possible explanation for this phenomenon could be that the unrest and disarray brought by natural disasters also impact the tendency to report crimes to the authorities, as both residents and authorities re-prioritize following such events. However, the fact that the estimated coefficients are negative in all models, including those where disasters occurred strictly in the year before reporting and the negative and statistically insignificant coefficient for violent crimes (where reporting is more likely), suggests that these results are unlikely to be driven by an omitted reporting bias. The negative and sometimes null effect we find also support previous studies' claims that looting following natural disasters is uncommon, and reports of its spread are exaggerated by the media (Barsky et al., 2006; Tierney et al., 2006).

Interestingly, the coefficients for the effect of natural disasters on crime rates in the neighboring counties is positive in all specifications. These results could be interpreted as spatial spillover of criminal activity from the affected county to the surrounding counties, with criminals reallocating their efforts to surrounding areas which were less affected by natural disasters. As security personnel may be divested away from unaffected counties to affected counties, causing a reduction in crime in directly affected counties, the relative vacuum in the neighboring counties can be exploited by criminals (Berrebi and Oswald,

¹⁶ Violent crimes include murder, rape, robbery and aggravated assault. Property crime includes burglary, larceny and motor vehicle thefts.

2013; Enders and Sandler, 2003; Lakdawalla and Zanjani, 2005).

6.3. Counties' characteristics

In Table 4 we test whether communities with different characteristics respond differently to natural disasters. We use several indicators at the county level to proxy for wealth, religious diversity income inequality. Counties were divided into two categories: those below the mean level of these indicators, and those above. This allows us to distinguish between the effect of natural disasters on different types of population. In column 1 we test the effect of natural disasters on contributions in wealthy counties, as the share of population with a subprime credit score (<660) is low. The interaction coefficient is positive, statistically significant and slightly larger than the raw coefficient (in row 1), indicating that while the average effect of a natural disaster in the victimized counties is negative, wealthier communities respond differently by increasing contributions. Individuals and communities' resources are not limited to their current income but also capital and wealth. However, wealth is harder to measure, as administrative data on it is rare or private. This different response by relatively wealthier counties might be explained simply by their higher level of available economic resources, making them less vulnerable to the threat of natural disasters on their economic well-being.

In column 2 we use data from the 2010 American Religious Census (Bacon et al., 2018) conducted by the Association of Statisticians of American Religious Bodies (ASARB) to investigate differing responses to natural disasters by religiosity. The census contains information on the number of religious establishments and adherents of over 236 religious bodies – from different Christian denominations to Jewish, Muslim and Eastern religions such as Buddhism, in all U.S. counties in 2010.¹⁷ In column 2, we construct an index of religious diversity of eight religious groups¹⁸ (based on Simpson (1949)), which can be interpreted as “the chance that two randomly selected religious adherents belong to different faiths”. The estimated coefficient indicates that counties with low religious diversity are less

¹⁷ There are no coefficients for the religious indicators themselves as there is virtually no temporal variation at the county level and the data was collected only for 2010. The variables are thus time-invariant and colinear with the county fixed effects.

¹⁸ The religious groups are: Catholics, Eastern-Orthodox Christians, Eastern-Religions (Buddhism, Hinduism, etc.), Jews, Mormons, Muslims, Protestants and others.

sensitive to the effect of natural disasters and are less likely to decrease their charitable contributions in response. An explanation for this result might be similar to the effect on low income-inequality counties. The lower the religious diversity, the higher the social cohesion.

In column 3 we investigate the link between income inequality, natural disasters and charitable contributions.¹⁹ Income inequality is defined as the ratio between the mean income of the highest quintile and the lowest quintile. For example, in 2014 the income inequality in New York, NY was 40.7 (i.e., the average income of the highest quintile is more than 40 times larger than that of the lowest quintile), while in Houston, TX it is 10.4. The estimated interaction coefficient shows that counties with a relatively low level of income-inequality respond differently to natural disasters. Counties with high income-inequality decrease their charitable contributions in response to natural disasters much more than counties with low income-inequality. This might be due to higher community cohesion, social connections, etc., in low income-inequality communities (Wilkinson and Pickett, 2009).

6.4. Governmental aid

There is no consensus among scholars who have studied the relationship between private donations and government funding, with respect to the direction or the magnitude of this relationship. The question of whether an increase in government expenditure increases or decreases individuals' and households' private contributions (i.e., crowding-in and crowding-out respectively) is important for academic research, as well as for professionals and policy makers.²⁰ A meta-analysis study of the crowding-out hypothesis by (de Wit and Bekkers, 2016), show that two-thirds of previous estimates found a negative correlation (crowding-out), while about one-third of the estimates found a positive correlation (crowding-in). They concluded that the results of these studies were shaped by the research method that was used.

In the U.S. the President has the prerogative to approve a disaster declaration.²¹ The presidential disaster declaration will allocate federal aid and funding to local governments,

¹⁹ Column 3 does not include a separate coefficient for income-inequality as the data is only available for a limited number of time periods. As the variation of this variable within counties is very low ($SD = 1.25$) compared to the variation between counties ($SD = 3.16$), we used the level of this variable in 2014 as a measure of each county's income inequality. Thus this variable is time-invariant, and is colinear with the county fixed effects.

²⁰ For example, can the private sector replace government support to charities (Khanna and Sandler, 1998).

²¹ Formally, a governor must first request a declaration, and the president may grant or deny it.

businesses and individuals in the affected area. Cash grants and low-interest loans are provided by the Federal Emergency Management Agency (FEMA) through the Small Business Administration (SBA). County level data about disaster related loans was retrieved from the SBA website and it includes, for each county-year, the number of grants (loans) and the principal amount of loans in USD.²²

It is possible that the negative effect of natural disasters on local philanthropic donations is due to the crowding-out properties resulting from expectations for public intervention. These expectations are further reinforced following governmental announcements of disaster relief programs and interventions. In this case, theory suggests that the severe economic damages associated with the catastrophic event combined with expectations that relief will be provided through public agencies could undermine tendencies to increase charitable giving. We utilize the variation in natural disasters and federal assistance to empirically separate out these intertwined effects. In Table 5, we investigate the crowding-out hypothesis of SBA grants on charitable contributions.

In columns 1 and 2 we include variables indicating the number of grants received in a county, and the principal amount in USD, respectively. The estimated coefficients are negative and statistically significant, supporting the crowding-out hypothesis. An additional SBA grant reduces donations by 1.09 million USD on average, and an additional 1,000 USD in the principal amount of SBA loans reduces donations by 1,500 USD. This holds even when we account for the direct effect of natural disasters on charitable contributions.

In columns 3 and 4, we test whether counties that received SBA grants and loans respond differently to natural disasters by including an interaction term between natural disasters and SBA grants and loans. While the coefficients of the natural disasters, SBA grants and principal amounts remain virtually unchanged from the previous two models, the non-statistically significant interaction coefficients suggest that counties which received federal monetary assistance do not respond differently to natural disasters than counties which did not receive such grants.

²² <https://www.sba.gov/about-sba/sba-performance/open-government/digital-sba/open-data/open-data-sources>

6.5. Philanthropy variations

Theory suggests that there might be substitution between different types of philanthropic and prosocial behaviors. Table 6 presents seven different variations for measuring our dependent variable – philanthropy. Column 1 presents our main specification model (similar to column 8 of Table 3) for comparison.

The decrease in donations (as seen in column 1) might be due to smaller amounts contributed by existing donors in the affected county. However, it is possible that catastrophic events drive current individuals who previously engaged in philanthropy to exit the giving circles. The SOI data includes in addition to the annual total monetary contribution amounts in each county, the number of individuals and households who reported charitable contributions. This is a measure of the number of donor households in each county. The negative and statistically significant coefficient in Column 2 indicates that each additional natural disaster event relates to a decrease in the number of donors on average. In other words, natural disasters not only decrease the scope of giving by current donors, but also decrease the number of individuals and households engaging in philanthropic activity.

In columns 3 and 4 the dependent variables and all control variables are in a per capita basis. We show that even when data is normalized by the counties' total population and by the donors' population, natural disasters are associated with a statistically significant decrease in charitable giving. The estimated coefficient indicates that a natural disaster is associated with a \$3.4 decrease in contributions per capita, and a \$19.5 decrease in contributions per donor.²³ For example, an additional natural disaster in Los Angeles, CA translates to a direct decrease of 34 million USD in charitable contributions in that county.

In column 5 we use the amount contributed and the adjusted gross income to create a new variable of contributions relative to income which we define as “county’s generosity”. Although our data is not detailed enough to investigate the generosity of individual philanthropists since it lacks crucial information about their wealth, using annual income and charitable giving provide a proxy measurement at the county level. The estimated coefficient is negative and statistically significant, indicating that on average natural disasters relate not only to a decrease in charitable giving, but also to a decrease in

²³ One should be careful interpreting this finding as a relationship between natural disasters and charitable giving on the individual level, since the data is aggregated on the county level and is subject to “ecological Fallacy” risk.

contributions as a share of the reported income.

In column 6 we test whether the effect of a disaster lasts beyond one calendar year. The model presented tests whether a more appropriate way to estimate the effect of natural disasters on prosocial behavior would be to use aggregates over longer periods. Accordingly, assuming that the effect could last longer than one year, we measured the effect on the scope of accrued donations in the subsequent two years. Although the estimated coefficient is slightly smaller than in our main model result, it is still negative and statistically significant indicating that contributions decrease even two years after the traumatic event. It is plausible that individuals and communities in the affected area feel vulnerable for a relatively long period, and as the recovery process may take several years, it influences negatively the prosocial behaviour in the local community for the long term.

In column 7 we use the amount of volunteering hours reported in each state (by year) retrieved from “Volunteering in America”.²⁴ Since the data is available only at the state level, we allocated to each county the value in its state. The estimated coefficients indicate that indeed, natural disasters are associated with a relative increase in the number of volunteers. This result is in line with Freeman's (1997) study, finding evidence for labor supply substitution effect in hours volunteered relative to charitable donations.

Catastrophic events such as natural disasters create a need for a variety of non-professional assistance possibilities. Providing shelter, collecting and delivering food and clothes to the vulnerable communities are a few examples that allow non-skilled individuals the opportunity to provide basic services and elementary goods to a massive population in stress in the aftermath of devastating events. In this case, it is possible that individuals might prefer to contribute time rather than dollars, as they might believe that volunteering their time will be more impactful than monetary donations. Other studies that investigated the trade-off between giving time and money are scarce and yielded mixed results (Bekkers, 2001; Freeman, 1997; Lee et al., 1999; Reed et al., 2016). A common belief is that volunteering has a significant role in the development of a healthy society. Indeed, in many cases volunteer activity is crucial, and in the case of natural disasters, the need for both professional and non-professional volunteers is salient.

²⁴ Unlike the monetary data which was retrieved from administrative datasets, volunteering data is based on surveys and questionnaires and therefore may be subject to a survey bias.

In this section we have provided further evidence to our main model results that natural disasters decrease monetary contribution in the affected county by testing the relationship between natural disasters and prosocial behavior over several different variations of the dependent variable. We show that the decrease in prosocial behaviour in the aftermath of a natural disaster is not restricted to a decrease in the monetary donations contributed, but the number of individuals who engage in philanthropic activity decreases as well. In addition, we provide an indication of an increase in the time of individuals engaging in volunteering activity following these events.

6.6. Main variable variations

In this section, we use different variations of our main explanatory variable of interest, natural disasters, to test the robustness of our preferred model's results presented in column 8 of Table 3. Table 7 presents five variations in addition to our preferred model. All models include the number of natural disaster events outside the affected county as a control variable. In column 1 we repeat our main model, where natural disasters are measured in terms of the number of events, where at least one fatality or injury occurred as a result of a natural hazard.

In column 2 we test the effect of the number of victims (fatalities and injuries) on charitable contributions. This variation provides a measure for the magnitude of the event. For example, in 2005, in Orleans Parish, Louisiana, hurricane Katrina was a single event, that claimed 638 fatalities. The estimated coefficient is statistically significant and negative, suggesting that a one standard deviation increase in victims from natural disasters (20.2), decreases charitable contributions by 1.5 million USD.

In column 3, we test the effect of significant natural disasters on the scope of charitable giving. For this purpose, we define a new independent variable - natural disasters which caused financial damages estimated at more than 1 million USD. Throughout our sample period, 1,055 significant disasters occurred. The estimated coefficient is much larger than in our main model, suggesting that the effect of such disasters is stronger than the effect of a typical natural disaster.

In column 4, we focus on metrological natural disasters, as defined by the Integrated

Research on Disaster Risk (IRDR) “Peril Classification and Hazard Glossary”.²⁵ Meteorological disasters are extreme weather and atmospheric conditions including extreme storms, extreme temperature and fog. These events constitute more than two thirds of all natural disasters and have claimed more than 75% of the total victims during our sample period. As such, these events could potentially be the main driving force behind our main model results. The estimated coefficient is negative and statistically significant, however it is smaller (in absolute terms) than in our main model, indicating that such events are not the sole driving force behind our results, emphasizing the importance of all types of natural disasters.

In column 5, we use natural hazards, as reported in the NOAA “Storm-Events” database. These include extreme weather phenomena which caused no injuries or fatalities in addition to natural disasters (our primary explanatory variable). As expected, the estimated coefficient is negative and statistically significant, yet much smaller in absolute terms than in our main model. Thus, all natural hazards have an effect on charitable contributions, yet natural disasters, which have more impact on human lives and livelihoods have a much stronger effect.

In column 6, we use natural hazards from another widely used dataset - Spatial Hazard Events and Losses Database for the United States (SHELDUS) from Arizona State University.²⁶ SHELDUS is an annual county level database of climatological, geophysical, hydrological and meteorological natural hazards and perils in the United States. Using this alternative data source for natural hazards allows us to verify that our results are not driven by methodological differences in data collection between the NOAA Storm-Events database and other potential sources. Indeed, the estimated coefficient for SHELDUS Natural Hazards is negative and statistically significant, thus lending support that our results are not driven by data-collection peculiarities.

7. Conclusions

This study uncovered the effect of natural disasters on individuals’ and communities’ pro and antisocial behavior by utilizing the exogenous spatial and temporal variation in

²⁵ <http://www.irdrinternational.org/2014/03/28/irdr-peril-classification-and-hazard-glossary/>

²⁶ Hazards & Vulnerability Research Institute (2016): <https://cemhs.asu.edu/sheldus>

natural disasters in the United States for over a decade to estimate its' causal effect. Our empirical strategy allows us to investigate both the reaction to natural disasters which impact an area directly, as well as individuals' response to natural disasters which strike at other communities.

Our main finding is that the local affected community reacts differently to natural disasters when compared to the surrounding communities, by reducing charitable contributions. Natural disasters have a negative impact on the affected communities in terms of reduction in the scope of charitable giving and in the number of individuals and households engaging in philanthropic activity following such events, while the surrounding neighboring communities increase their formal giving. These findings lend support to theories which suggest that when one's resources are at jeopardy, she or he will strive to protect and conserve these resources (COR model) in particular financial resources, which translates to a decrease in prosocial behavior. However, when one's resources are not directly threatened, feelings of empathy and solidarity with the victims increase, which translate into an increase in prosocial behavior (Social Support Model). Our results suggest that the overall effect is positive due to the reaction by those whose resources aren't threatened, as they more than offset the strong direct local negative effect. We further show that social cohesion is a determining factor in the vulnerability of communities to natural disasters, as the reduction in prosocial behavior is strongest among counties with a high level of income-inequality, low wealth and low religious homogeneity.

Interestingly, we find that natural disasters not only affect prosocial behavior in the victimized counties, but also antisocial behavior. In the wake of natural disasters, media and social networks often report on looting and other types of crime. However, on the contrary, our analysis shows that crime rate is negatively associated with natural disasters in the victimized communities. This result supports previous studies which argued that looting following natural disasters in the United States is uncommon, and reports about its spread are exaggerated by the media.

Additionally, we utilize information on federal assistance issued as special loans by the Small Business Administration to test for a crowding-out effect of private contributions by governmental aid, and find that while there is some evidence for

crowding-out whereby federal loans are associated with a reduction in private charitable contributions. However, both counties which received federal assistance and those which did not are negatively affected by natural disasters, and the magnitude of said effect on charitable contributions does not differ between them. Two possible explanations to the apparent non-effect of governmental aid emerge. Either the governmental assistance is not high enough to offset the overall negative effect and risk to the individual's resources and expected income, or alternatively the behavioral reduction response in charitable contributions stems mostly from perceived expected threats to resources, so that even a small increase in uncertainty following natural disasters triggers anxiety, which is enough to cause a decrease in charitable contributions.

This study provides insights for policy makers and professionals in the field of disaster recovery. The apparent threat on resources affects the willingness to engage in prosocial behavior in response to natural disasters. Policy measures to increase individuals' confidence might cause a resurgence in contributions in the directly affected communities, while a viable route to increase overall contributions would be to target fundraising among the non-directly affected neighboring communities.

Table 1. Summary statistics

	Mean	SD	Min	Max
Charitable contributions (K)	59,313	239,348	0	7,352,734
Natural Disasters	0.29	0.81	0	19
Adjusted Gross Income (K)	2,896,603	10,684,665	533	333,116,736
Unemployment rate (%)	6.73	2.87	1.12	28.85
BA or higher (%)	18.89	8.61	3.20	78.80
Poverty rate (%)	15.42	5.97	2.39	57.80
Population (K)	98.67	315.38	0.07	10,123.25
Republican county (=1)	0.77			
N = 37,137				

Notes: Monetary variables are in 2015 terms. (K) denotes variables is in thousands.

Table 2. The effect of natural disasters on charitable contributions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Contributions amount (K) (t+1)							
Natural Disasters	-1816.1*** (697.5)	-1790.9*** (689.7)	-1873.9*** (640.0)	-1871.5*** (638.1)	-1960.4*** (699.8)	-1956.4*** (699.8)	-1956.9*** (699.7)	-1959.6*** (699.6)
Natural Disasters Out		118.3*** (24.23)	115.8*** (23.32)	109.7*** (22.86)	114.7*** (24.02)	113.7*** (23.91)	113.8*** (24.01)	113.5*** (23.99)
AGI			0.00572** (0.00275)	0.00566** (0.00275)	0.00465* (0.00281)	0.00466* (0.00281)	0.00467* (0.00282)	0.00466* (0.00282)
Unemployment rate (%)				-733.6*** (185.5)	-812.3*** (209.1)	-823.8*** (210.4)	-837.6*** (212.6)	-841.7*** (213.2)
Population					164.1 (182.6)	166.9 (183.1)	166.7 (183.2)	168.4 (183.8)
BA or higher (%)						-554.7*** (208.7)	-550.9*** (207.4)	-545.1*** (207.7)
Poverty Rate (%)							51.18 (91.27)	55.91 (90.32)
Republican								1145.3 (947.0)
Constant	59701.2*** (205.1)	-41830.6** (20823.5)	-56067.0*** (21535.7)	-45617.5** (21581.1)	-62566.7** (29346.2)	-51537.7* (27347.8)	-52382.5* (27919.5)	-53311.8* (28059.8)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34036	34036	34036	34036	34036	34030	34030	34030
R ² Within	0.00158	0.00875	0.0361	0.0370	0.0412	0.0415	0.0415	0.0416

Notes: Standard Errors clustered at the county level in parentheses

* $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$

Table 3. The effect of natural disasters on crime

Dependent variable:	(1) Crime rate (t+1)	(2) Violent crime rate (t+1)	(3) Property crime rate (t+1)	(4) Crime rate (t)	(5) Violent crime rate (t)	(6) Property crime rate (t)
Natural Disasters	-0.131** (0.0624)	-0.00397 (0.0112)	-0.127** (0.0554)	-0.112* (0.0594)	-0.00322 (0.00937)	-0.109** (0.0543)
Natural Disasters Out	0.0164*** (0.00174)	0.00151*** (0.000284)	0.0149*** (0.00161)	0.0218*** (0.00176)	0.00211*** (0.000290)	0.0197*** (0.00163)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	30953	30953	30953	34075	34075	34075
R ² Within	0.00675	0.00463	0.00668	0.00965	0.00638	0.00942

Notes: Standard Errors clustered at the county level in parentheses.

** $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$*

Table 4. Natural disasters and county characteristics - Wealth, Religious Diversity and Income Inequality

Dependent variable:	(1)	(2)	(3)
	Contributions amount (K) (t+1)		
Natural Disasters In	-3688.1*** (1184.0)	-3092.9*** (1051.9)	-3210.0*** (1156.0)
Natural Disasters Out	113.7*** (23.93)	112.6*** (23.99)	113.0*** (24.04)
Credit Score<660 (% of pop) Below mean	1999.5 (1853.2)		
Natural Disasters In × Credit Score<660 (% of pop) Below mean	3749.9** (1663.9)		
Natural Disasters In × Religious Diversity Below mean		3126.7*** (1073.0)	
Natural Disasters In × Income Inequality Below mean			2901.1** (1182.1)
Control Variables	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Observations	34027	34030	33934
R ² Within	0.0442	0.0427	0.0426

Notes: Standard errors clustered at the county level in parentheses.

** p<0.1 ** p<0.05 *** p<0.01*

Table 5. Natural disasters and federal assistance

Dependent variable:	(1)	(2)	(3)	(4)
	Contributions amount (K) (t+1)			
Natural Disasters In	-1785.8*** (683.5)	-1840.1*** (681.4)	-1779.4*** (532.8)	-1758.0*** (537.3)
Natural Disasters Out	111.8*** (23.12)	112.7*** (23.68)	111.8*** (23.40)	112.5*** (23.94)
# SBA Grants	-1098.5** (530.4)		-1097.3* (566.5)	
Funds from SBA(K)		-1.527** (0.708)		-1.510** (0.740)
Natural Disasters In × # SBA Grants			-0.516 (45.09)	
Natural Disasters In × Funds from SBA(K)				-0.00967 (0.0630)
Control Variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Observations	34030	34030	34030	34030
R ² Within	0.0536	0.0564	0.989	0.989

Notes: Standard errors clustered at the county level in parentheses.

** p<0.1 ** p<0.05 *** p<0.01*

Table 6. Dependent variable variations

Dependent variable:	(1) Contributions amount (K) (t+1)	(2) #Itemizer donors (t+1)†	(3) Contributions amount per capita (t+1)	(4) Contributions amount per donor (t+1)	(5) Generosity (t+1)	(6) Contributions amount (K) (t+2)	(7) Volunteer Hours (M) (t+1)
Natural Disasters	-1959.6*** (699.6)	-188.6* (105.7)	-3.418*** (1.223)	-19.52** (7.912)	-0.00318* (0.00162)	-1454.5** (739.2)	0.606** (0.290)
Natural Disasters Out	113.5*** (23.99)	8.123*** (1.202)	0.266*** (0.0282)	1.216*** (0.224)	0.000336*** (0.0000515)	68.42*** (16.66)	-0.211*** (0.0112)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34030	30944	34030	30740	34030	30923	34047
R ² Within	0.0416	0.139	0.0285	0.0140	0.00666	0.0568	0.0241

Notes:

† #Itemizer donors is measured by the number of tax returns reporting charitable contributions.

Data is unavailable in 2008 due to SOI's data policy change at this year.

Standard Errors clustered at the county level in parentheses.

* $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$

Table 7. Main variable variations

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Contributions amount (K) (t+1)					
Natural Disasters – Events	-1959.6*** (699.6)					
Natural Disasters – Victims		-74.70* (40.27)				
Natural Disasters – Financial Damage Over 1M \$			-3372.7** (1453.1)			
Natural Disasters – Meteorological				-1345.9** (549.3)		
Natural Hazards					-94.33*** (31.58)	
SHELDUS Natural Hazards						-195.7** (88.28)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	34030	34030	34030	34023	34030	34030
R ² Within	0.0416	0.0367	0.0382	0.0402	0.0389	0.0373

*Notes: Hazards are all extreme climate events registered by the NCDC.
SHELDUS is an alternative dataset of natural hazards at the county level.
Standard Errors clustered at the county level in parentheses.*

** $p < 0.1$ ** $p < 0.05$ *** $p < 0.01$*

The previous chapter investigated the effect of natural disasters on prosocial and antisocial behavior of individuals and communities. The next two chapters uncover the behavior respond of individuals and communities to human-made extreme events. Chapter 2 focuses on the relationship between terror attacks and charitable giving of individuals and households in Israel in the recent decade.

Chapter 2 – Terrorism and philanthropy: the effect of terror attacks on the scope of giving by individuals and households

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Terrorism and Philanthropy: The Effect of Terror Attacks on the Scope of Giving by Individuals and Households

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.

1. Introduction

Immediately following the terror events of 9/11, many leading performing artists expressed their support by donating substantial amounts of money to the victims and their families. In the wake of the attacks, Madonna donated the entire proceeds from her concert, Jim Carrey donated \$1 million and Julia Roberts donated \$2 million to help the victims. Britney Spears raised almost \$1 million with her U.S. tour that began in November 2001, and Paul McCartney, Michael Jackson, and David Bowie performed at benefit concerts for the victims raising \$2 million collectively. Celebrities were not the only ones to respond in this manner. Corporations reacted immediately as well, contributing over \$180 million in one single week.²⁷ 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, economy and policy. Much has been written about the importance of philanthropic behavior to society such as the relationship between individuals and society, the identification level between the individual and their community, the provision of a security net to disadvantaged groups, the narrowing of the gap between groups from different socio-economic classes, expressing and supporting the individual's values and more (Frumkin 2006; Payton and Moody 2008). Total giving in the USA during 2014 was over \$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 rate has remained steady over the years and highest in comparison to other countries. In Israel, total contributions in 2011 were about \$1.58 billion (0.6% of GDP) with the largest portion (approximately 70%) also gifted by households and individual donors (Israeli Central Bureau of Statistics 2014).²⁸ 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 about

²⁷ 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.

²⁸ ICBS (Israel Central Bureau of Statistics), Philanthropy of Israelis 2009-2011, a press release: (www.cbs.gov.il/www/hodaot2014n/08_14_053b.pdf).

philanthropy explores the effects of socio-economic, psychological and cultural variables on philanthropic 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 through intimidation of 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 U.S. 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 U.S. State Department has already categorized and specified the set of contemporary terrorist groups (Berrebi 2007; Krueger 2008).²⁹ The tactic used by terror groups to achieve their goals is to create a shocking event, or a campaign of a series of shocking events that causes an impact many times greater than the input invested in its execution that influences a target audience beyond the immediate victims.³⁰ The desired effect of terrorist’s tactics are not necessarily the direct consequences of the violence (deaths and property damage), but primarily the consequences of the fear triggered among the targeted population. Although the likelihood of being harmed by terrorism is negligible, the fear created by terrorism has 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 shifting of individuals’ political preferences (Berrebi and Klor 2008; Getmansky and Zeitzoff 2014), and the costs of increased security measures and changes in individual choices (Becker and Rubinstein 2011).³¹

Terrorism claims a physical, emotional and economic price, and the relatively high rate of casualties and damages demands responses beyond that which are typically supplied by the government. This gap is partially filled by nonprofit organizations dealing with the consequences of terror attacks and their related aspects. For the most part, these

²⁹ Office of the Law Revision Counsel, U.S. House of Representatives, Title 22 of the U.S. Code, Section 2656f (d).

³⁰ The impact is also intended to be greater than a similar increase in risk caused by other types of events (Becker and Rubinstein 2011).

³¹ Compared to other relatively rare events like being struck by lightning, etc.

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 triggers residents of a locality to alter their daily routine as a consequence of a change in their perceived personal security. This can have a direct effect on their attitude toward philanthropy. Terror attacks may also impact the locality's economy and its residents' expected future income (Berrebi and Klor 2008; Berrebi and Ostwald 2013).

Behavioral reactions to terror attacks may be displayed in different ways. While some individuals react by holding back on their financial activity (including charity giving) 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. Steinberg and Rooney (2005) showed that individuals' and corporations' response to the 9/11 terrorist attacks was immediate and at an unprecedented level. Studies analyzing the aftermath of the 9/11 attacks found that Americans were willing to donate more time and money (Putnam 2002; Torabi and Seo 2004). Jonas et al. (2002) demonstrated that reminding people of death leads to a more favorable attitude toward charities. In experimental studies, Ferraro et al. (2005) and later Hirschberger et al. (2008) found a positive relation between high mortality salience and the amount 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, 2003b; Krueger 2008). The decrease in the economic indicators following a terror attack, together with the vulnerable sense of individuals who were affected by terrorism, could potentially result in a decrease in the scope of giving by local philanthropists following terror attacks.

In this paper we study the relationship between terror attacks and the scope of giving by local 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 varying characteristics, along with information about charitable giving following these

events. Our information about Israeli philanthropists include their annual scope of giving to formal nonprofit organizations as well as their geographic location (in addition to other demographic and economic variables). This allows us to study potential changes in giving patterns by philanthropists in localities that were directly affected by terrorism, compared to a control group of philanthropists in other localities not subjected to terror attacks, while controlling for 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 a contribution, and to a growing body of literature on the relation between terrorism and socio-economic behaviors. While studies relating to catastrophes or terrorism and philanthropy have typically investigated a single case study disaster, this study 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.³²

2. Background and theoretical framework

The beginning of the second *intifada* (Palestinian uprising) in September 2000 marked a new era of violence following a period of relative calm. Thousands of terror attacks against Israeli targets were launched from the end of 2000 through 2007, killing hundreds and wounding more than 5,000 civilians.³³

The underlying motivation for this study relies on two classes of theories: those that predict an increase in giving after an act of terror and those that predict a decline in giving following an act of terror. 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 model from the fields of sociology and philanthropy, and the economic theory based on the marginal utility of gifting.

³² Most papers on this topic dealt with case studies such as the 9/11 terror attack (Steinberg and Rooney 2005).

³³ Israel Ministry of Foreign Affairs

(<http://www.mfa.gov.il/MFA/ForeignPolicy/Terrorism/Palestinian/Pages/Victims%20of%20Palestinian%20Violence%20and%20Terrorism%20since.aspx>)

Stress Theory describes the cause of psychological stress in the context of a relationship between individuals and the environment, which is perceived as threatening their resources and endangering their well-being. Lazarus and Folkman (1984) discuss the “concept of vulnerability” as related to adequacy of resources. Vulnerability is described as a potential threat that is turned into an active threat when one’s resources are actually put in jeopardy.

According to Hobfoll’s Conservation of Resources (COR) model, people strive to build and protect their resources, and stress can threaten or result in a potential or actual loss of these resources, 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.

Terror Management Theory (TMT), first presented by Greenberg et al. (1986) 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, provides protection from the fear of death. In other words, awareness of mortality (the salience mortality paradigm) intensifies the desire to express pro-social attitudes and to engage in pro-social behavior (Jonas et al. 2002).

Identifiable Victim Effect suggests that people are inclined to spend more to save the lives of identified 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 function 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 increased welfare caused by the gifting is greater than the forgone utility that could have been generated from their wealth in alternate uses. Hence, if the cost of acquiring utility from gifts decreases (following terrorism) relative to the cost of acquiring utility from other sources, *ceteris paribus*, individuals will increase the size of their gifts. In other words, following a terror attack, the wealth of some individuals within

the community and their welfare dramatically decreases. Consequently, the utility maximization hypothesis 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 charity 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 Theory 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, due 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 increased contributions following terrorism, while traditional economic theory might suggest the opposite effect due to 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 socio-economic information of every donor in Israel, who claimed tax credit during 1999-2011. This donor information is then merged with terrorism data for that period.

3.1 Philanthropy data

Data on philanthropy were obtained and merged from two sources: (1) The Israeli Tax Authority, and (2) The Israeli Central Bureau of Statistics - Population Registry.³⁴ This provides us with information about 1,378,170 observations derived from the tax return reports submitted by 153,130 individuals and households who claimed tax credit from contributions to “certified” non-profit organizations during at least one of the years: 1999, 2000, 2004, 2006-2011.³⁵ This represents the entire universe of all donors who claimed tax credit during this period. For each observation the dataset includes economic variables such as annual income, spouse’s annual income, source of income (salaries, business profits or loss, interest, capital gain, etc.), annual amount donated by each individual and household and the sum of tax credit received. This information was paired with annual socio-demographic data for each observation culled from the Population Registry. The dataset includes, on an annual basis, socio-demographic variables such as age, marital status, residence, and number of children.³⁶ Individuals, who died during the panel analyzed period, were excluded from the data following the year of death, which brings the total number of observations to 1,359,251.

Donor’s average annual donation was 2,943 NIS* (about \$822).³⁷ This number is higher than findings reported in previous studies about Israel that 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=1,000) in 2006 (865 NIS*) and 1,540 NIS (N=1,538) in 2008 (1,690 NIS*). Based on our data, donors’ average annual income was 298,508 NIS* (about \$83,426), more than twice the annual average income in Israel in 2011.³⁸

98.89% of all itemizers were 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 return reports. However, since our data consist of a full and complete panel, it includes

³⁴ The dataset was created for the purpose of this particular study and is not readily publicly available.

³⁵ Years in which the Israeli Income Tax Authority’s data are available.

³⁶ 399 cases representing entities, which are not individuals, or individuals that are neither Israeli citizens nor Israeli residents were excluded from the analyses. These cases (a total of 3,591 observations) had neither an indication of a residence address in Israel nor any socio-economic information.

³⁷ Amounts in NIS* correspond to New Israeli Shekels (NIS) in fixed 2011 NIS (i.e. in real terms).

³⁸ ICBS: http://www.cbs.gov.il/reader/?Mival=cw_usr_view_SHTML&ID=404

also young donors who claimed tax credit in the later waves of the panel. The youngest donor's age when donating was 18.³⁹ 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 0 donations. The average donor age was 48.61 and 19.19% of the donors were female.⁴⁰ 81.68% of the donors were married 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 dataset period. While the number of itemizers who claimed tax credit more than doubled over the years - from 29,419 individuals in 1999 to 61,038 in 2011, the total donations reported increased almost four times (in real terms) during that period.

Theoretically, one could question whether the set of tax itemizers who claimed tax credit for their donations are representative of all donors. Indeed, individuals and household who make non-substantial (i.e. small) donations are less likely to submit a tax return report. 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 among small donors. This study focuses on those likely to make substantial donations.⁴¹

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 fatalities between 1999 and 2011. During this time period, 433 fatal terror attacks occurred against Israeli citizens and residents that killed 1,162 and injured thousands. The data does not include failed attacks (i.e. attacks that were prevented, foiled, or attacks with no casualties involved). Each observation includes detailed information about the weapon used by the perpetrators (gun, bomb, suicide attack, knife, rocket, etc.), 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 about the attacks was obtained from the Israeli

³⁹ Due to privacy concerns our age variable has been divided into five categories: 0-20, 21-40, 41-60, 61-80, 81+.

⁴⁰ In the case of household donations, gender is associated with the head of household.

⁴¹ Since the decision to engage in philanthropic behavior might be endogenous, one should be careful in generalizing our findings to the entire population.

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 of terror attacks. Overall, during the time period studied, the data displays an average of 33.31 terror attacks a year and 89.38 fatalities per year. While the most frequent method of attack committed was by gun (n=209) (not presented in the table), suicide attacks (n=81) caused the largest number of fatalities (n=544). During the data period, the fatalities per suicide attack ratio were 3.8 times higher than fatalities per attack from all other terrorism methods. The highest number 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 neighboring terrorism levels was implemented for a locality's level of terror attack incidents. Data on localities' distances 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 the Israeli geographic coordinates system, also known as the Israeli Transverse Mercator. This enabled us to calculate the distances between localities and determine the set of neighboring localities within a given radius for each of Israel's localities. Using this data, we generated lagged measures of proximate terror attacks and fatalities in neighboring localities within the range of 20 km (radius) to be used as instruments for a locality's level of terror incidents.

4. Methodology

This section describes our main empirical strategy used to identify the causal effects of terrorism on philanthropy. The strategy is based on longitudinal (panel) data that uses the variation of terror attacks across time and space in order 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) vis-à-vis 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 of giving preferences by treatment and control groups would be the same once other local and individual characteristics have been controlled for.⁴²

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

$$donation_{ilt+1} = \alpha + \beta terrorism_{lt} + \gamma socio_demg_{it} + \rho locality_l + \tau_t + \varepsilon_{ilt+1}$$

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 socio-economic 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 latter captures time specific change that would simultaneously affect all philanthropists.⁴³ The proposed econometric specification is intended to identify the local effect of terror attacks on the scope of giving.⁴⁴

We estimated the effect of terrorism on philanthropy using a panel dataset of 152,731 individuals and households in 264 localities over a period of nine years between 1999 and 2011. Our specifications utilized 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 geographic location and physical characteristics tend to be constant over time. The locality fixed effects model allows us to control for these and other time-invariant factors that could potentially influence the donor's behavior in any particular locality. Once we control for time and locality determinants, the

⁴² Importantly, unlike the traditional difference-in-differences approach, our methodology has the additional advantage of relying on an explanatory variable with differing treatment intensity across localities on a yearly basis. See Angrist and Pischke (2009, Chapter 5) for a thorough explanation of the panel fixed effects with multiple periods and differing treatment intensity across time and space methodology.

⁴³ 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), Dugan and Chenoweth (2012) for the differing effects of different responses to attacks.

⁴⁴ For robustness sake, and in order to estimate separately the effect of terrorism outside of the donor's locality, we also introduced models that include controls for the countrywide effects of terror attacks in addition to the yearly temporal fixed effects in Table A2 in the online appendix.

assumption for a valid causal interpretation is that any remaining within-locality variation in terrorism is exogenous. This assumption is strongly supported in the Israeli context. Terrorism targets tend to be determined by locality's properties, such as proximity to terror bases, proximity to borders and the symbolic importance of the target (Berrebi and Lakdawalla, 2007). Once the time invariant characteristics are controlled 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' decision 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 use year fixed effects to control for any time specific factors, such as national trends in giving patterns that would equally affect all localities and donors in any given year.⁴⁵

In our main specification we used a model in which the independent covariates are lagged one year 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 that year were captured by the charitable donation considerations.⁴⁶

While fixed effects models reduce many of our concerns with respect to omitted variable bias, endogeneity of other terrorism variables could potentially still remain a concern. 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 socio-economic and demographic factors, we want to make sure that our measures of terrorism are strictly exogenous. To further address endogeneity concerns, 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 maintaining its independence from the error term. To do so we had to find a variable predictive of the level of terrorism, but not associated with charitable giving except through its influence on terrorism levels.

⁴⁵ All models include standard errors clustered at the individual level, which are robust to arbitrary heteroskedasticity and serial correlation.

⁴⁶ 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.

Our approach uses lagged domestic terrorism incidents and fatalities in neighboring localities as instruments for a locality's level of terrorism. Empirical studies have shown that shocks to terrorism are likely to influence levels of domestic terrorism in neighboring geographical areas (Berrebi and Ostwald 2013; Enders et al. 2011). In particular Enders et al. (2011) demonstrated the potential for domestic terrorism to spread into neighboring countries, finding that domestic terrorism often results in spillover. We chose domestic terrorism in neighboring localities as our instrument, since on the one hand neighboring terrorism and local terrorism are highly correlated, and terrorism tends to spillover from one locality to the neighboring one, while on the other hand, due to localities' segregated nature the factors that could simultaneously influence both terrorism and charitable donations in a specific locality are typically domestic (e.g. economic, political, geographic, demographic conditions). These factors are unlikely to be related with the neighboring area's local conditions (except for the effect through terrorism). The literature on the segregated nature of Israel's localities, and the lack of socio-economic, demographic and political spillovers among neighboring localities is vast. For example, Floersheimer Institute (2006) and Van Leer Jerusalem Institute (2009) provide strong evidence about persistent segregation and differences among adjacent localities in Israel.

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 locality's level of terrorism. For the IV specifications we use lagged neighboring domestic terrorism incidents and fatalities in the range of 20 km as our instruments.⁴⁷ In addition, controls for time and locality fixed effects account for inherent temporal shocks 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:

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

⁴⁷ Since, owing to imagined spillovers, there always remains a possible concern that neighboring terrorism will affect charitable giving in nearby locations directly. We additionally tested alternative ranges (where direct spillovers are less likely) and within reasonable distance provided qualitatively similar results.

First stage (neighbouring terrorism):

$terrorism_{it} =$

$$\alpha + \omega \sum_{k=1}^n (near_terr_{k \neq l, t-1, t-2}) + \gamma socio_demg_{it} + \rho locality_l + \tau_t + \epsilon_{it}$$

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

Where, $near_terr_{k \neq l, t-1, t-2}$ 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 socio-economic and demographic control variables for individual i at time t . *Locality*, and *year* fixed effects are designated as $locality_l$, 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 a different impact on different subgroups of populations even if its overall effect is positive. To account for these effects, we used interaction terms in our models, which interacts each of the variables “gender”, “marital status”, “religious affiliation”, and “ethnic origin” with “terrorism” to estimate the particular responsiveness of these subgroups of donors to terrorism. In addition, an interaction term for “income” levels and other donor's subclasses with “terrorism” allowed us to estimate the effect of marginal income, its sources and persistent giving in conjuncture with terrorism on the scope of donation.

5. Empirical results

5.1 Main specification

Table 3 depicts the results for our main model in which we estimated the effect of lagged terror attacks on the scope of giving by philanthropists. The first row presents 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 6 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 effect of terror attacks on the scope of donations to formal organizations in the subsequent year.⁴⁸ In the other covariates, we see that age and the number of children are positively associated with donation contributions in the following year. Non Jewish religious affiliation is negatively associated with donations.⁴⁹ 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 to a 10,444 NIS* (about \$2,900) increase in average donations observed in the year following one standard deviation increase in the number of terrorist attacks.⁵⁰ To put these findings into perspective one should note that this effect is larger than the average U.S. household yearly charitable donations, and greater than 3.5 times the Israeli average household annual donations among charitable contribution itemizers.⁵¹ In context of the Israeli income distribution this effect is greater than the gross monthly earnings of 70% of Israel's employees, and greater than the average gross monthly income.⁵² Our results are robust to the inclusion of various controls and the relationship between terror attacks and giving remains consistently statistically significant.⁵³

It is possible that terror attacks outside the donor's locality could also affect the scope of giving. Terrorism outside the donor's locality is accounted for in our models through the inclusion of year fixed effects. However, to alleviate any remaining concerns

⁴⁸ "Formal" or "qualified" organization are similar to approved 501(c)(3) organizations in the U.S.

⁴⁹ Those of non Jewish religious affiliation are minorities in Israel.

⁵⁰ One standard deviation of Israel's yearly terrorist attacks equals 32.6034.

⁵¹ Based on the Urban Institute (2013) report the average annual household charitable contribution in the U.S. between 2001 and 2011 is \$2,689 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> .

⁵² Earning 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 9,355 NIS*. Income statistics were obtained from the ICBS http://www.cbs.gov.il/reader/shnaton/templ_shnaton.html?num_tab=st12_34&CYear=2012 .

we additionally examined this potential effect in a longitudinal analysis setting. Since the sum of terror attacks in a donor's locality and terror attacks outside the locality equals 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 variables were set in accordance to ICBS definitions. Region ranges were created to include a wider geographical area, so that it divides the country into four main regions: North, South, Center and outside the 1967 borders. Table A2 in the online appendix clearly shows that there is no additional effect of terror attacks outside a donor's locality once year fixed effects are included. The remaining coefficients for all other control variables remain of similar magnitude and direction, and maintain similar statistical significance to the one presented in Table 3.

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 implemented 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 analysis. 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 could potentially 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 implemented an instrumental variable approach using terrorism in neighboring localities to instrument for local terrorism.

Table 4 depicts 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 shows 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. The 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 threshold, 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 result in 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 the OLS analysis, however whether or not we include the full set of control variables, the terrorism coefficient remains positive and statistically significant. Other covariates display similar results 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 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 so that it measures relative changes in the amounts donated, as opposed

to the absolute amount of donations. 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' subclasses

The literature on charitable giving devote great attention to the particularities of subclasses 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 subclasses of donors.

Income: The first column in panel A of Table 5 presents an estimation of the effect of terrorism on donors of different income, 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 an increase 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 are more sensitive to the income risks associated with terrorism.

Wealth: Wealth owners are defined as donors 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 significantly increase their average donations following terrorism.

Persistent donors: Panel B presents the effect of terror attacks on persistent donors. This subclass of donors contains individuals who donate 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 significantly increase their donations in response to terrorism. In

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

5.6 Individual characteristics

Tables 6 in the appendix 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.

Gender and Marital Status: While there are no significant differences in terms of average donations between male and female donors, or between married and non-married individuals, the negative and statistically significant coefficients for the interactions variables of terrorism with gender and marital status indicates 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 coping with stress may be more emotionally focused and therefore following a stressor threat may assume more responsibilities towards their own home, family and children. 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 the potential income loss, and other risks associated with terrorism and 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).

Minorities (non Jewish religious affiliation): In Israel, Arabs are the largest minority amongst all religiously based minority groups (about 20% of the population). Column 3 of Table 6 suggests that minorities on average gives less in comparison to 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 main possibly contradicting behavioral effects, on one hand the conservation of resources as a result of expected economic decline, and on the other hand growing empathy with the victims. The negative

and statistically significant coefficient indicates that the Arab minority in Israel on average shows less solidarity and empathy with the community's distress following terrorism.⁵⁴

Ethnic origins: Israel is often praised as an immigration country where immigrants of many different ethnicities have successfully assembled together. However, since its establishment, Israel has also 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 and 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 compared 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 performed to the main analysis presented in Table 3. These tests show that the effect of terrorism on the scope of giving by philanthropists is robust to alternative specifications of the main variables of interest used in the analysis, 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 the frequency of terrorist acts had more impact than the severity of the acts. Accordingly, consistent terrorist campaigns, whether of high or low severity, had a larger impact than rare but 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 of attacks (Berrebi and Ostwald 2014). Since this study analyzes the effect of sequential terror

⁵⁴ While our analysis provide insight to religious heterogeneity, Putnam & Campbell (2010) show the additional importance of religiosity levels on charitable giving. Provided appropriate data this distinction could be a venue for future directions of inquiry.

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 to the level of terrorism. The fatalities variable is a good proxy for the magnitude of the attacks, and is measured by the number of fatal casualties resulting from each attack. This measure emphasizes attacks resulting in many fatalities as opposed to those that result in a single or few fatalities. According to the terrorism coefficient presented in the fatalities specification of Table 7 one standard deviation increase in terror fatalities increase the yearly average donations by 8,156 NIS* (about \$2,300). This measure is comparable to the one obtained when using attacks to estimate terrorism, since during the dataset 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 effect 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 dataset period were the most lethal amongst 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 compared to 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 localities beyond the 1967 borders, or localities with particular national and religious characteristics. Column 5 measures the effect of terror attacks excluding localities in the territories occupied in 1967. These localities are geographically located in areas characterized by higher friction with the 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 excluding non-Jewish localities. Jewish localities are defined as localities 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 from terrorist attacks against Israeli targets, and who might on average attenuate the effect of terrorism on the majority of donors. Indeed, the coefficient for the effect of terrorism in this specification is almost twice as large in magnitude when compared to our basic model specification. In both models the main effect remains positive and statistically significant and all other covariates show quantitatively similar effects as 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 due to the selection of the donations measure, and in order to increase the confidence in our results we performed several robustness tests using alternative variations of the dependent variable. Table A6 in the online appendix presents the effect of terrorism on different measures of the dependent variable. These 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 empirically assessed the effect of terrorism on the scope of giving by individual donors. The evidence suggests that terrorism has a positive and statistically significant effect on the scope of giving. The findings are robust across a multitude of model specifications, different measures of terrorism as well as different measures of donations. Furthermore, we used an instrumental variable approach to identify a causal link and address potential endogeneity concerns. Our robustness analyses reinforce our 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 salaried income, both higher average donations and greater 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 in face of terrorism females and non-married donors tend to reduce their average donations. Religious minorities (non-Jewish) and Israelis of Asian, African, and European ethnic origin (i.e. non- American origins) donate less on average, and further reduce their giving in response to terrorism. These groups associated with an average reduction in donations following terrorism were either likely to be more sensitive to the economic risks following terrorism, or less likely to increase solidarity and empathy with the distress that follows terrorist attacks.

In terms of combating terrorism and alleviating the consequences in the aftermath of terrorist attacks, it is important to consider a more systematic mechanism and potentially greater reliance on the willingness of philanthropists to step-in and fill the immediate needs, in particular in those places where government response tend to be too slow or too bureaucratically cumbersome.

Table 1. Philanthropy summary statistics

	Mean	SD	Min	Max	p50
Donation	2,943	150,078	0	113,858,344	0
Income	298,508	979,235	-33,521	942,341,376	200,917
Age [†]	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

Notes: 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.

[†] Age has been divided into 5 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+

Table 2. Terrorism descriptive statistics

Year	All terrorist attacks		Suicide bombers' attacks	
	# Attacks	# Fatalities	# Attacks	# Fatalities
(1)	(2)	(3)	(4)	(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

Table 3. Panel OLS - The effect of terrorism on philanthropy

Dependent Variable: Donation (t+1)

Variable	(1)	(2)	(3)	(4)	(5)	(6)
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

Notes: *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

Table 4. IV approach: nearby domestic terrorism

Dependent Variable: Donation (t+1)						
Instruments	Lagged (t-1 and t-2) Nearby Terror Attacks and Fatalities					
Variable	(1)	(2)	(3)	(4)	(5)	(6)
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)	.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

Notes: 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

Table 5. Panel OLS -Interactions (donors' subclass by: Income, Wealth, Consistency)

Dependent Variable: Donation (t+1)				
	Panel A		Panel B	
	(1)	(2)		(3)
Subclass:	Income	Wealth Owner	Subclass:	Consistent Donor
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 (0.0008)	Income	0.0010 (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	902996
R ² Overall	0.0009	0.0008	R ² Overall	0.0010

Notes: *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

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

Dependent Variable: Donation (t+1)			
	(1)	(2)	(3)
Individual Characteristic:	Female	Non Married	Non Jewish (minorities)
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

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

Table 7. Panel OLS - Terror variable variations

Dependent Variable: Donation (t+1)						
Terror Variable	(1) Attacks	(2) Fatalities	(3) Suicide Attacks	(4) Suicide Fatalities	(5) Attacks	(6) Attacks
Sample	All Localities	All Localities	All Localities	All Localities	Localities within 1967 Borders	Jewish Localities
Terrorism	320.3414** (136.0330)	74.4032** (31.1200)	1343.4420* (690.7458)	138.4756** (68.4663)	325.3520** (142.1912)	574.4204* (293.2132)
Income	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0009)	0.0006 (0.0005)
Age	752.7461*** (264.2923)	752.6222*** (264.2360)	752.6254*** (264.1743)	752.7437*** (264.1888)	762.1200*** (273.6047)	747.4910** (354.6369)
Children	480.2579*** (121.9076)	480.5267*** (121.9167)	480.6815*** (121.9212)	480.6741*** (121.9208)	505.5956*** (136.6169)	460.3036*** (108.5923)
Non Jewish	-1181.6967*** (318.9929)	-1181.3865*** (319.0355)	-1182.1662*** (319.0292)	-1182.1617*** (319.0303)	-1202.7497*** (323.0922)	-1149.7788*** (408.9832)
Non Married	-749.8174 (528.0641)	-750.6824 (528.2118)	-751.8458 (528.4489)	-751.8770 (528.4467)	-760.7939 (570.7712)	-693.8568 (639.7317)
Female	18.4118 (825.8353)	18.9873 (825.9109)	19.6134 (826.0505)	19.5821 (826.0423)	-6.1617 (893.9796)	597.5932 (1345.7942)
Constant	-3566.7916*** (892.2067)	-3594.1100*** (897.8331)	-3620.1078*** (902.0746)	-3618.8362*** (901.6144)	-3676.2228*** (962.7114)	-3300.2616*** (1053.3573)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes
N	902996	902996	902996	902996	834388	783930
R ² Overall	0.0008	0.0008	0.0008	0.0008	0.0008	0.0007

Notes: 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

Appendix: Supplementary Material

Table A1. Philanthropy trends summary statistics

Year	# Itemizers	Annual average donation	Donations to income ratio	Avg. donation to GDP per capita	Donations	
					Total	Mean (SD)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1999	29,419	5,214	0.36%	5.29%	153,381,203	1,004 (10,717)
2000	33,533	9,036	0.60%	8.64%	302,999,225	1,985 (291,877)
2004	42,116	7,110	0.70%	6.92%	299,464,325	1,970 (40,149)
2006	49,604	9,069	0.93%	8.29%	449,883,167	2,971 (64,775)
2007	59,821	9,253	1.11%	8.12%	553,551,378	3,665 (88,630)
2008	60,507	9,856	1.22%	8.54%	596,358,701	3,959 (297,809)
2009	65,653	7,546	1.06%	6.57%	495,391,461	3,299 (59,338)
2010	72,459	7,479	1.21%	6.29%	541,913,362	3,622 (69,536)
2011	61,038	9,946	1.95%	8.11%	607,113,623	4,076 (78,131)

N = 1,359,251

Notes: Table A1 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).

Table A2. Panel OLS - The effect of terrorism (incl. terrorism outside of the locality) on philanthropy

Dependent Variable: Donation (t+1)				
Terror Out Variable	None (1)	Region (2)	District (3)	Sub-district (4)
Terrorism	320.3414** (136.0330)	333.5147** (140.8374)	325.3750** (140.3375)	312.8569** (129.9292)
Terrorism-Out		80.3367 (63.7521)	52.2568 (57.0555)	110.1011 (131.2257)
Income	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)
Age	752.7461*** (264.2923)	754.3403*** (264.2691)	752.8308*** (264.3344)	752.9310*** (264.3724)
Children	480.2579*** (121.9076)	479.6873*** (122.1218)	479.9660*** (121.9731)	479.9940*** (121.9837)
Non Jewish	-1181.6967*** (318.9929)	-1181.4477*** (319.0263)	-1181.3707*** (318.9091)	-1181.4671*** (318.9146)
Non Married	-749.8174 (528.0641)	-749.8367 (528.0649)	-749.7385 (528.0208)	-749.7052 (528.0077)
Female	18.4118 (825.8353)	18.4879 (825.8920)	18.2822 (825.7684)	18.3824 (825.8232)
Constant	-3566.7916*** (892.2067)	-3520.1137*** (913.9347)	-3716.7341*** (907.5213)	-3624.2017*** (893.3211)
Time FE	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes
N	902996	902996	902996	902996
R ² Overall	0.0008	0.0008	0.0008	0.0008

Notes: *Terrorism* = terror attacks in the donor's locality; *Terrorism Out* = terror attacks outside donor's locality; *Region* = total of 4 regions; *District* = total of 7 districts; *Sub-district* = total of 24 sub-districts; Significance levels: *** is 0.01, ** is 0.05, and * is 0.10 ; Clustered standard errors in parentheses

Table A3. FD Panel OLS - The effect of terrorism on philanthropy

Dependent Variable: Δ Donation (t+1)				
Variable	(1)	(2)	(3)	(4)
Δ Terrorism	203.3951** (95.5237)	229.9569* (125.2804)	229.8931* (125.2991)	229.8595* (125.2989)
Δ Income		0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Δ Children			68.5780 (330.8206)	77.2564 (328.0227)
Δ Non Married				168.4596 (240.6457)
Δ Constant	410.4835*** (150.1354)	409.1950*** (150.3727)	405.0060*** (153.6198)	404.9844*** (153.6188)
Δ Time FE	Yes	Yes	Yes	Yes
N	902142	600372	600372	600372
R2 Overall	0.0000072	0.0000067	0.0000067	0.0000067

Notes: Dependent variable is the change in the scope of giving (t+1)-(t) by donor i in locality l ; *Terrorism* = terror attacks in the donor's locality; Significance levels: *** is 0.01, ** is 0.05, and * is 0.10 ; Robust standard errors in parentheses

Log variations:

Some 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 so that it measures relative changes in the amounts donated, as opposed to the absolute amount of donations. In order to evaluate these possibilities, we test our model using "level-log", "log-level" and "log-log" regression model specifications. The "level-log" model analyzes the effect of changes in terrorism on the scope of donations, the "log-level" model analyzes the effect of terrorism on the relative change in the scope of giving, and the "log-log", model presents the elasticity, which measures the percentage change in the scope of giving in response to a percentage change in terrorism.

The results are presented in Table A4 are consistent with the results of our main model. In each of the presented variations, regardless of the measurement method used, whether we measured the dependent variable and/or the independent variable in levels or as a relative change, the effect of terrorism on philanthropy remains positive and statistically significant. Column 4 shows that one percent increase in terror attacks generates 4.3 percent increase in the scope of giving by individuals and households. In other words, the elasticity of donations with respect to terrorism is 4.3 percent.

Table A4. Panel OLS - The effect of terrorism on philanthropy - log variations

Dependent Variable:	Donation (t+1)	Donation (t+1)	Log Donation (t+1)	Log Donation (t+1)
Variable	(1)	(2)	(3)	(4)
Terrorism	320.3414** (136.0330)		0.0115** (0.0045)	
Log-Terrorism		926.6405** (367.2496)		0.0434*** (0.0110)
Income	0.0011 (0.0008)	0.0011 (0.0008)	8.12e-08 (6.34e-08)	8.12e-08 (6.34e-08)
Age	752.7461*** (264.2923)	753.3111*** (264.4239)	0.1866*** (0.0080)	0.1866*** (0.0080)
Children	480.2579*** (121.9076)	479.9066*** (121.9052)	0.1757*** (0.0040)	0.1757*** (0.0040)
Non Jewish	-1181.6967*** (318.9929)	-1182.3726*** (319.0348)	-0.7468*** (0.0659)	-0.7469*** (0.0659)
Non Married	-749.8174 (528.0641)	-749.4818 (527.9985)	-0.4881*** (0.0179)	-0.4880*** (0.0179)
Female	18.4118 (825.8353)	17.9974 (825.7528)	-0.0527*** (0.0156)	-0.0528*** (0.0156)
Constant	-3566.7916*** (892.2067)	-3540.1434*** (891.0381)	0.4958** (0.2083)	0.4980** (0.2083)
Time FE	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes
N	902996	902996	902996	902996
R2 Overall	0.0008	0.0008	0.0585	0.0585

Notes: *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

Ethnic origins:

Israel is often praised as an immigration country where immigrants of many different ethnicities have successfully assembled together. Israel, however, has also experienced, since its establishment, conflicts and discrimination based on the different ethnic origins among its Jewish population. Although some scholars claim that the gap between the two main ethnic groups (those with African and Asian origins, versus those with European and American origins) is significantly narrowing, and is less noticeable among second and third generation Israelis (Dahan 2013), it still plays a major role in every political campaign, in the media, and in academia. We therefore perform an analysis for the effect of terrorism on donors of different ethnic origins. While we didn't observe statistically significant differences between donation patterns of those with African, Asian, European and American origins, the results presented in Table A5 show that Israeli donors of non-American ethnic origin, on average, donate less compared to those of American origin, and on average reduce their giving in response to terrorism.⁵⁵ These findings may suggest that as far as philanthropic behavior goes the traditional division between those of European and those of African and Asian ethnic origins are no longer noticeable among Israelis. However, the philanthropic culture and sensitivities brought by those Israelis of American origins has not yet trickled down locally.

⁵⁵ Ethnic groups in Israel include: Native Israelis, and those of African, Asian, European, American origins. In our analyses the American sub-group is our omitted category of comparison.

Table A5. Panel OLS - Interactions (ethnicity background)

Dependent Variable: Donation (t+1)					
	(1)	(2)	(3)	(4)	(5)
Ethnicity:	African+Asian +Israeli	African+Asian +Israeli+Unknown	African+Asian +European	African+Asian +European+Israeli	African+Asian +European+Israeli +Unknown
Terrorism	556.9971*** (194.2238)	674.4442*** (248.2000)	601.8786** (255.5651)	1054.4660*** (378.8804)	2164.3008*** (821.8084)
Ethnicity	-1368.8460*** (359.5879)	-1298.3430*** (473.3274)	-1442.2698*** (473.7971)	-1200.2218** (493.1088)	-3590.5564*** (919.6030)
Terrorism × Ethnicity	-633.8891*** (226.6193)	-622.4212** (284.8506)	-513.1789* (293.7060)	-1061.0033*** (393.1247)	-2077.5478** (819.4254)
Income	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)	0.0011 (0.0008)
Age	444.3859* (247.9633)	656.5676*** (243.5760)	785.3490*** (263.7437)	553.3783* (290.3117)	759.7343*** (264.6484)
Children	479.4502*** (121.5047)	498.7445*** (124.0870)	474.7396*** (122.3549)	461.7507*** (122.6104)	481.5818*** (121.6772)
Non Jewish	-1464.0782*** (337.0721)	-1484.0133*** (345.1928)	-1278.0360*** (329.0634)	-1144.5882*** (314.8932)	-1168.5053*** (317.3382)
Non Married	-727.3743 (530.6710)	-701.0201 (532.9602)	-788.8850 (535.9743)	-771.4365 (527.7111)	-728.9122 (527.7381)
Female	-45.6915 (835.5021)	-34.6104 (832.8406)	-66.1016 (810.5764)	-22.5131 (829.0328)	-73.3472 (831.1723)
Constant	-2535.6310*** (733.5816)	-2543.7257*** (654.2193)	-2998.6525*** (999.9498)	-2426.1789** (1053.6802)	-155.2755 (1102.7691)
Time FE	Yes	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes	Yes
N	902996	902996	902996	902996	902996
R2 Overall	0.0008	0.0008	0.0008	0.0008	0.0008

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

Additional robustness tests:

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 due to the selection of the donations measure, and in order to increase the confidence in our results we performed several robustness tests using alternative variations of the dependent variable. Table A6 below presents the effect of terrorism on different measures of the dependent variable. These 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. Some economists may argue that due to menu cost effect, contributions do not adjust immediately to changing economic conditions, thus leading to nominal rigidity (also known as sticky prices).⁵⁶ In order to test this, we repeated our main model specifications while using all our monetary variables (i.e. donations and income) in nominal prices. Column 2 in Table A6 display the resulting coefficients, all our estimates including the coefficients of other covariates are in accordance with our main model.

In column 3 we present the results for a macroeconomic oriented indicator that measure our dependent variable as the share of donation relative to GDP per capita. Column 4 presents a micro level oriented ratio that measures donations relative to the donor's household size. These ratios present alternative approaches for measuring philanthropy which emphasizes in different ways the relative generosity of the donor. Assuming that a donor's decision to contribute is not detached from the macroeconomic conditions, column 3 presents the results for donations normalized to the GDP per capita. Column 4 emphasizes the importance of the donor's household size in the decision of how much to contribute. Assuming that the donation decision is a household joint decision, the donations to household size ratio takes into account the number of individuals taking part in this decision. This ratio also reflects the number of family dependents taken into consideration when determining the scope of giving. The results for these variations are consistent with the results of our main model specification.

⁵⁶ For further details see Sheshinski and Weiss (1977).

Columns 5 and 6 offer alternative measures that reflect the change and persistence of the charitable contribution. The model presented in Column 5 analyzes the effect of terrorism on the relative change in donations from one year to next. While the model presented in column 6 tests whether a more appropriate way to estimate the effect of terrorism on philanthropy would be to use aggregates over longer periods. Accordingly, assuming that the effect could last longer than one year, we measured the effect of terrorism on the scope of accrued donations in the subsequent two years. Across all variations, the results show a consistent, positive and statistically significant relationship between terrorism and charitable giving.

Table A6. Panel OLS - Dependent Variable Variations

Dependent Variable:	Donation (t+1)	Donation (t+1) (Current Prices)	Donation/GDP per capita (t+1)	Donation/HH size (t+1)	Δ Donation (t+1)	Donations (t+1)+(t+2)
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Terrorism	320.3414** (136.0330)	280.0415** (116.9844)	0.0029** (0.0012)	79.9593** (31.9682)	395.0064* (214.7619)	218.9744* (130.6936)
Income	0.0011 (0.0008)	0.0011 (0.0009)	9.53e-09 (7.42e-09)	0.0002 (0.0002)	0.0002 (0.0001)	0.0007 (0.0007)
Age	752.7461*** (264.2923)	675.7609*** (244.5108)	0.0066*** (0.0023)	308.1929*** (62.3345)	-112.2075** (50.9405)	641.0271 (397.5186)
Children	480.2579*** (121.9076)	446.1674*** (109.8845)	0.0041*** (0.0011)		-12.5748 (42.3803)	1301.5113*** (342.9027)
Non Jewish	-1181.6967*** (318.9929)	-1120.2150*** (275.6184)	-0.0100*** (0.0029)	-221.8362*** (85.3667)	175.2806 (249.5860)	-3509.5350*** (441.8536)
Non Married	-749.8174 (528.0641)	-608.6500 (434.9048)	-0.0070 (0.0049)		-500.3860 (455.9543)	-1019.2335** (499.8577)
Female	18.4118 (825.8353)	-102.7546 (654.8412)	0.0010 (0.0078)	86.3089 (151.3351)	811.0702 (800.2397)	-1652.2900*** (621.7803)
Constant	-3566.7916*** (892.2067)	-3464.9131*** (787.6704)	-0.0295*** (0.0079)	-839.6999*** (153.1376)	704.9842 (451.7988)	-2988.8554*** (828.3810)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes
N	902996	902996	902996	902996	902996	602222
R2 Overall	0.0008	0.0008	0.0008	0.0010	0.0004	0.0008

Notes: 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

Unlike terror attacks in Israel which are usually carried out by perpetrators from outside the victimized community, active shooters in the United States usually emerge from within the affected communities and differ from terrorists in their motivation. While both events cause stress and fear among the affected populations. Their effect on pro and antisocial behavior on individuals and communities may differ. The next chapter uncovers the relationship between mass shootings and philanthropy in the U.S in the recent decade.

Chapter 3 – Crime and Philanthropy: Antisocial and Prosocial Responses to Mass Shootings

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Crime and Philanthropy: Antisocial and Prosocial Responses to Mass Shootings

Abstract

Mass shootings have a strong impact on public discourse and perception, affecting more than their direct victims. We use data on charitable contributions and criminal activity in the U.S. over the last decade to identify and quantify the effect of mass shootings on prosocial and antisocial behavior. We find that the effect of mass shootings on prosocial behavior is positive and statistically significant. However, the directly affected localities react to mass shootings differently than their neighboring communities, decreasing their charitable contributions. Additionally, we show that mass shootings are different than any other criminal behavior, including all other violent offenses, in terms of its effect on prosocial and antisocial behavior.

1. Introduction

Mass shootings are distinctive events compared to other deadly types of events. They are unpredicted, practically impossible to forecast, occur without warning and frequently end abruptly with the death of the shooter. Unlike other types of deadly crimes such as homicides, robberies or burglaries most mass shootings are premeditated and intended to kill as many random individuals as possible with whom the predator has no direct specific conflict (Langman, 2009; Newman, 2004; Wilson and Petersilia, 2011).

Mass shootings are always geographically constricted to a single community, taking place within a single location such as a school, workplace, theatre, shopping center etc., and although these events are relatively rare, the frequent and sensational media coverage distributes and amplifies its impact far beyond the immediate victims involved and the surrounding community.⁵⁷

Lankford (2016a), finds that more public mass shootings occurred in the U.S. than in any other country in the world. According to the FBI's 2014 active shooter report, mass shootings in the United States have increased three-fold in the last fifteen years (Blair and Schweit, 2014). The issue of mass shooting has crossed the political spectrum. In his statement following the traumatic event in Oregon in 2015, president Obama expressed his frustration with the repeated mass shootings during his tenure, stating that "somehow this has become routine".⁵⁸ President Donald Trump recently said that "mass shootings have been going too long in our country" as he offered his first public remarks on the school shooting in Santa Fe, Texas.⁵⁹

For most of the population the event will be conveyed through the media which heavily influences the public's perception (Duwe, 2005; Shultz et al., 2014). Previous research on traumatic events, such as terrorist attacks and natural disasters, shows that the psychological effects of these events are not limited only to the direct victims. Residents of the afflicted communities and even people living far away can become psychologically affected (Berrebi and Yonah, 2016; Bonanno et al., 2007; Silver et al., 2002; Schlenger et al., 2002; Schuster

⁵⁷ Mass shootings are rare and distinctive events compared to the background frequency and death toll associated with single-victim or "targeted" firearm homicides. In the U.S. for example, "random/rampage" shootings are responsible for a small fraction of 1 % of firearm homicides (Shultz et al., 2014).

⁵⁸ <https://obamawhitehouse.archives.gov/blog/2015/10/01/watch-president-obamas-statement-shooting-oregon>.

⁵⁹ <https://edition.cnn.com/2018/05/18/politics/trump-texas-school-shooting/index.html>

et al., 2001). Media coverage following collective traumas has been observed to have public health effects, particularly in terms of stress-related symptoms (Holman et al., 2014). The shooting at Utøya Island seemed to have had a significant effect on the entire Norwegian population, creating sadness and insecurity, at least in the short term. Psychological proximity was associated with stress reactions in the general population (Shultz et al., 2014).

Two different types of reactions of the victims and the afflicted communities as a result of mass shooting tragedies are well documented. Major depression and anxiety on one hand, and solidarity and support on the other hand. Depression and anxiety are frequently documented in many studies that found Post-Traumatic Stress disorder (PTSD) symptoms in the aftermath of mass shooting events. Hough et al. (1990), argued that traumatic events provoke PTSD symptoms in the afflicted community in which the event occurs. Media attention keeps the trauma alive and fresh not only for the survival victims, but also for those who were exposed to the events through the extensive and repetitive media coverage, which lasts for a much longer time. On the other hand, there is also documentation of prosocial behavior as a reaction to traumatic events, stating, for example, that in the aftermath of the tragedy, residents of the afflicted community came together holding hands and talking, creating spontaneous shrines by placing candles near site (Collins, 2004; Eyre, 2007; Hawdon et al., 2010; Hawdon et al., 2012; Nurmi et al., 2012; Turkel, 2002).

In this study, we aim to investigate the relationship between mass shootings and individuals and communities' social behavior in the United States. Using longitudinal data with multiple treatment periods and differing treatment intensities across time and space in a fixed effects approach, we analyze mass shootings by date, geographic location, and other characteristics, along with information about charitable giving following these events. This allows us to study and identify potential changes in aggregate giving patterns by donors in communities that were affected directly by mass shootings, compared to a control group of donors in other communities not subjected to these events, while holding constant income, other demographic variables as well as particular regional characteristics. The analysis herein is, to the best of our knowledge, the first attempt to investigate the effect of mass shootings on prosocial behavior and specifically on philanthropy, beyond the affected community, over a relatively long period.

2. Theory and Conceptual Framework

Behavioral responses to traumatic events may be displayed in different ways. While some individuals react by holding back on their financial activity (including charitable giving) following stressful events, others may express more generosity by increasing their giving due to solidarity and empathy with the victims. To explain the potentially feasible range of behavioral outcomes expected following mass shootings, we rely on the following theories: terror management theory (TMT), the identifiable victim effect, the conservation of resources model (COR), and blame and the diffusion of responsibility theories from the field of psychology.

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 prosocial attitudes and to engage in prosocial 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 anonymous or statistical victims (Jenni and Loewenstein, 1997). The extensive media coverage of mass shooting incidents turns many of the victims to identifiable victims, as well as the affected community as a whole. According to this theory people would potentially increase their charitable giving due to a heightened compassion and empathy towards the victims and the suffering communities. In other words, "the more we know the more we care" (Schelling, 1968). Prosocial behavior in the aftermath of traumatic events is also supported by previous empirical studies. In recent empirical research studying the effect of terror attacks on philanthropy, Berrebi and Yonah (2016) show that individuals and households increase their charitable giving following these events, and that proximity to the event was a contributing factor. Chamlee-Wright and Storr (2010), in a study of natural disaster, presented a similar effect in the aftermath of Hurricane Katrina.

On the other hand, according to the COR model and blame theories, a counter behavioral response to mass shootings may be observed. The COR model suggests that people strive to build and protect their assets, which include both psychological and material resources, and stress can threaten or result in a potential or actual loss of these assets, (Hobfoll, 1989,

2001, 2011). This model provides a framework for examining the impact of adverse experiences on individuals' actions following a major stress event, predicting a decrease in philanthropic activity engagement due to the heightened perceived need of individuals to preserve their resources.

Several psychological theories emphasize the role of blame, and suggest that following negative traumatic events, people (observers or bystanders) will tend to have two possible contradicting reactions toward victims. They might either express compassion and sympathy, or alternatively assign responsibility and blame to the victims for their unfortunate outcome. The blame is the result of the observer's attempt to maintain his/her belief in a just world, where people get what they deserve, or conversely, deserve what they get (Appelbaum, 2002; Furnham, 1995; Heider, 1958; Lerner and Simmons, 1966). Shaver (1985) and later Alicke (2008) emphasized the role of foreseeability and intentionality in the process of victim blame. In our context, these elements exist simultaneously. The long standing public discourse and criticism in the United States regarding gun control policy and the ease at which firearms are accessible, demonstrate the foreseeability of the potential destructive outcome among those in the public who believe that there is a link between the vast gun ownership and mass shootings. The second element seems to be obvious as there is no doubt about the intention of the predator to kill as many random victims as possible. According to these theories, following mass shooting events, people may potentially decrease their charitable giving due to a heightened blame towards the victims which overcomes the feelings of compassion and empathy.

The diffusion of responsibility theory suggests that in the event of an emergency situation, when an individual is aware of other observers, he or she feels less compelled or responsible to help as it is assumed that help would be provided by the other observers. Not only the responsibility for helping is diffused among the observers, but also there is diffusion of potential blame for not taking action (Darley and Latne, 1968). According to this theory, it is possible that individuals in the affected community would be less likely to engage in prosocial behavior, and the responsibility to help, including contributing monetary donations, could be diffused among the members of the community. Previous research on the relationship between diffusion of responsibility and charitable giving demonstrated that indeed, individuals who were either in a group or aware of other observers

were found to be less likely to donate (Blair et al., 2005; Garcia et al., 2002; Levine and Crowther, 2008; Wiesenthal et al., 1983).

As described above, theory alone does not provide a definitive behavioral prediction for possible prosocial reactions by individuals and households following mass shooting events. Additionally, there are some particular factors in the context of the 21st century in the United States which should be taken into consideration when analyzing these contradicting effects. Accordingly, there exists a complex relationship between guns, prosocial behavior and mass shootings, with various potential underlying mechanisms at play. Firstly, assuming these events were completely random probabilistic events, as the number of guns increase, the likelihood of a mass shooting event would increase as well. Indeed, in the aftermath of a mass shooting event, public groups, politicians and others often call for stricter gun control measures. Interestingly, the public discourse induces more gun purchases as people proceed to acquire firearms as they either believe owning a gun would increase their ability to protect themselves, or due to fear that such restrictions will apply in the near future (Depetris-Chauvin, 2015; Wallace, 2015). This again could potentially increase the likelihood of a mass shooting event, contributing to a cyclical exemplifying pattern. On the other hand, some may argue that the proliferation of firearm ownership by individuals could potentially decrease the likelihood of mass shootings. President Trump commented in an interview with the press (during his candidacy) after the mass shooting event in Oregon, that if more people had guns, fewer people would have died, as the response to the predator could have been faster.⁶⁰ The idea underlying this claim is that the vast distribution of firearms may deter potential perpetrators, realizing they could face immediate response by other armed individuals and fail in their mission.

Secondly, there is a clear political divide in the U.S. with respect to private ownership of firearms. Over 58% of gun owners identify as Republican or Republican leaning, with only 39% Democrat or Democrat leaning. This divide is even greater when examining members of the National Rifle Association (NRA), with over 77% of it's members being Republican or Republican leaning.⁶¹ As such, the Republican share of voters tends to be highly

⁶⁰ <https://www.nbcnews.com/meet-the-press/video/full-brennan-a-lot-the-public-doesn-t-know-about-trump-tower-meeting-123545555944>.

⁶¹ <http://www.pewresearch.org/fact-tank/2017/07/05/among-gun-owners-nra-members-have-a-unique-set-of-views-and-experiences/>.

correlated with the number of firearms per capita, while the share of Democrat voters tends to be negatively correlated with it ($r=0.39$ and $r=-0.31$ respectively).⁶² The relationship between political affiliation and charitable contributions is mixed, with Republicans on average being more generous. However, one should be careful when interpreting this finding as this tendency is often argued to be driven by greater religiosity (Margolis and Sances, 2017).

Thirdly, media reports can potentially influence donations to charitable causes following mass shooting events, as coverage usually focuses on the victims' tragedy, evoking empathy toward the survivors and emphasis on their immediate needs.⁶³ Mass shootings differ from other types of homicides in the media coverage it receives and in the public's response to these reports. Mass shootings receive disproportionately large amounts of coverage across all media outlets. While this could increase charitable giving (in all forms) both within and from outside of the community, the language used in reporting these events typically focuses on the victimized communities as opposed to single personally identified victims, ("Las Vegas is under attack").⁶⁴ Thus, it is plausible that residents of an affected community might feel their own safety and resources threatened, and intra-community accusations of responsibility for the act might fracture solidarity and cause a decline in charitable giving.

Combining these factors and their underlying mechanisms illustrates the complexity of the inter-relationship between politics, guns, charitable giving and mass shootings. As noted earlier, the behavioral reaction of the surrounding communities to these stressful events is not easy to predict since the combination of these factors have the potential to affect prosocial and antisocial behavior in different directions.

This allows us to address various questions: (1) As there are contradicting theories with respect to the potential behavioral outcome following stressful events, what is the relationship between mass shootings and charitable giving? (2) Given the political divide in the U.S. regarding controlled firearms and the role of government (as opposed to individualism and community responsibility), are there differing responses to mass shootings across political lines? (3) Based on the above-described mechanisms, is an

⁶² Author's calculations, cross state correlation in the 2012 presidential elections. $p < 0.05$ in both estimates.

⁶³ <http://www.ktnv.com/news/las-vegas-shooting/2-clark-county-red-cross-locations-filled-to-capacity-with-donations>

⁶⁴ [https://www.theglobeandmail.com/news/world/las-vegas-shooting/article36455626/.](https://www.theglobeandmail.com/news/world/las-vegas-shooting/article36455626/)

increase in gun ownership linked with higher or lower charitable giving? (4) Based on the blame theories discussed above, to what extent does community fracturing and polarization follow mass shooting events? (5) Are there different responses to mass shootings by victimized communities that were affected directly, versus more distanced communities? and finally, (6) Since prosocial response to mass shootings could be displayed in different forms, do we observe a substitution effect between monetary giving and other forms of philanthropic behavior such as volunteering in the aftermath of mass shootings?

3. Data and Empirical Framework

For our main analyses of the links between mass shootings and philanthropy in the United States, we constructed a panel dataset consisting of charitable contributions of household and individual tax itemizers, at a state level, for each year from 2004 to 2015, and combined it with supplementary economic and demographic information.⁶⁵ This donor information was merged with mass shooting data for the respective period.

3.1. Mass shootings data

Mass shootings data was obtained from the “Stanford Mass Shootings of America” (MSA) data project (Stanford Geospatial Center, 2017). The MSA contains detailed listings for each reported mass shooting event in our sample period, the decade spanning 2004-2015. The MSA’s definition of a “Mass Shooting” is a shooting event with at least three victims (injured or murdered). In the period between 2004 and 2015, 149 mass shootings occurred claiming 1161 victims, of them 688 deaths. Other control variables included in our analysis were chosen based on the theories and mechanisms described above and are the adjusted gross income (*AGI*) of all individuals and households who submitted tax returns (retrieved from the SOI); the number of residents (*Population*); number of residents below the poverty line (*Poor*); *Unemployment* rate in each state as reported by the Bureau of Labor Statistics; the number of adults holding a *BA* (or equivalent) degree or higher as reported by the Census Bureau; *Republican* is used as an indicator variable which equals 1 if the republican presidential candidate won in the state’s most recent elections; and the state’s number of

⁶⁵ As some of our key covariates are only available at the state level, this is our main level of analysis. However, since both mass shootings and charitable contributions are available at a more granular level, we also employ several drill downs to the county level.

background checks for firearm purchases (*NICS*), as reported by the FBI National Background Checks system.

Following Depetris-Chauvin (2015), we use the FBI's National Instant Criminal Background Check System (NICS) state annual data to proxy for the prevalence of firearms. Federal regulation requires each gun purchaser to go through a background check. It should be noted that a single background check does not equate to a single firearm purchased, as one might purchase several firearms or none. Nevertheless, the NICS data is regularly used by the firearms industry itself and is highly correlated with the national annual gun sales. It should also be noted that the NICS figures represent flows (increases) rather than the stocks of firearms in a state. The underlying assumption is that the purchase level of firearms is highly correlated with the local existing stock of firearms (summary statistics is not presented, but available upon request).

3.2. Philanthropy data

The data about philanthropy in the United States was retrieved from the IRS Statistics of Income (SOI) division.⁶⁶ The data is based on the annual tax returns submitted by U.S. citizens (at zip level), aggregated at the state level.⁶⁷ ⁶⁸ The data contains, detailed information including, but not limited to, the adjusted gross income of all individuals and households who itemize deductions, the number of itemized returns reporting contributions, and the amount of charitable contributions made to qualified organizations, as reported to the IRS (summary statistics is not presented, but available upon request).⁶⁹

4. Empirical Strategy

To study the relationship between mass shooting events and the scope of giving by philanthropists, we use the spatial and temporal variation in philanthropic donations and mass shootings within and across states. We are therefore able to statistically compare victim states (treatment group) over time with other states (control group) as we control for other relevant economic, demographic and political variables, and while controlling for the

⁶⁶ <https://www.irs.gov/statistics/soi-tax-stats-individual-income-tax-statistics-zip-code-data-soi>.

⁶⁷ We followed SOI's recommendations and instructions to aggregate the data to the county level.

⁶⁸ As mentioned earlier, our data is available at a more granular level, therefore we employ further analyses at a higher resolution at the county level as well.

⁶⁹ Form 1040, Schedule A

state’s and period’s particularities. This allows us to isolate and quantify the local effect of mass shooting on the scope of giving. Our baseline methodological approach relies on a Panel Fixed Effects model. Formally, our main model specification is:

$$D_{i\ t+1} = \alpha Mass_shoot_{i\ t} + \gamma X_{i\ t} + \mu_i + \tau_t + \epsilon$$

Where:

$D_{i\ t+1}$ is the scope of giving by all philanthropists in states i in year $t+1$. $Mass_shoot_{i\ t}$ is the number of mass shooting events that occurred in state i at year t , $X_{i\ t}$ is a vector of socio-economic, demographic, and political control variables that vary across space and time (such as adjusted gross income, voting preferences, and the number of firearms). μ_i is a geographical fixed effect unique to states i , and τ_t is a temporal fixed effect unique to year t . Accordingly, our main coefficient of interest is α . Standard errors are clustered at the state level, as this is the level in which treatment of mass shooting events are applied (for more of this methodological approach see Abadie et al., 2017).

We estimated the effect of mass shootings on philanthropy using a panel dataset of the 49 mainland U.S. states over a decade between 2004 and 2015.⁷⁰ Our specifications utilize a panel ordinary least squares (Panel- OLS) framework with both state and year fixed effects, which mitigate many of the concerns for potential omitted variable bias. Once we control for time and state fixed factors, and for all other socio-economic, demographic, and political variables, the assumption for a valid identification is that any remaining within-state variation in mass shootings is likely to be exogenous.

Since our data is aggregated at the state level, it is subject to the “ecological fallacy” risk. An average state contribution does not represent the actual distribution of monetary donations by individuals and households or their characteristics. Although it is impossible to completely eliminate this concern, we alleviate it considerably by running several robustness checks such as analyzing the relationship between mass shootings and charitable giving at the county level, which is a much smaller and relatively more homogeneous aggregate unit than the state unit (see further analysis in section 5.2). It should also be noted that our main focus in this study is on the national and community level responses and not on the effect of mass shootings on any particular individual.

⁷⁰ 48 mainland states and the District of Columbia.

5. Empirical Results

5.1. Main specification

Table 1 reports the results for our baseline model in which we estimate the effect of lagged mass shooting attacks on the scope of charitable contributions by American donors.⁷¹ The first row shows the coefficients for the effect of mass shootings within a state, which is our main variable of interest.

Our preferred specification is presented in column eight and includes the full set of explanatory variables. The results presented in the table support our hypothesis that mass shootings positively affect philanthropy, thus an additional mass shooting event is associated with a mean increase of 207.9 million USD in charitable contributions in the affected state in the following year. To put this result into perspective, 200 million USD amount to 5% of the mean contribution across states. The average yearly number of mass shooting events between 2004-2014 is 7.6, thus the mean total annual effect of mass shootings on charitable contributions is approximately 1.5 billion USD. Our main model results are in line with previous study's findings (Berrebi and Yonah, 2016) that suggest that extreme events, such as terrorist attacks, generated a net increase in philanthropic donations in affected communities.

5.2. County level

As a robustness test to our main specification findings, we further analyzed our data on a county level. There are 3,108 counties and county equivalents in the mainland U.S. Counties are significantly smaller units compare to states, and supposedly more homogeneous on several dimensions, such as culture, economic activity, religiosity and political division. Being highly homogenous on one hand, but very different from the state level on the other hand, allows us to better analyze factors for which differences are only indicative at the county level, when estimating the relationship between mass shootings and charitable giving. More importantly, analyzing relatively homogenous units (particularly when

⁷¹ Though the mechanism for reverse causality between contributions and mass shooting fatalities seems unlikely, we lag the explanatory variables both to ascertain the chronological order of the events, in which mass shooting events occurred prior to contributions, and in order to better address endogeneity concerns.

compared to states) allow us to alleviate many of the concerns associated with potential ecological fallacy at the state level, and can yield interesting results.

Our analysis at the county level uses zip level tax data from the IRS's SOI, aggregated at the county level. All other covariates are culled at the county level, except the NICS (firearm background checks) which remains at the state level (since this information is not available at a county level and cannot possibly be omitted). Counties that suffered from mass shootings are used as a treatment group that allows us to analyze the variation in philanthropy across time, in comparison with other counties (control group) while controlling for all other relevant economic, demographic and political variables. This empirical approach allows us to estimate the local effect of mass shooting on the scope of giving.

Our methodological approach relies on a Panel Fixed Effects model. Formally, our model specification is:

$$D_{i,t+1} = \alpha Mass_shoot_{i,t} + \beta \sum Mass_shoot_{j \neq i,t} | r \leq 3000 + \gamma X_{i,t} + \mu_i + \tau_t + \epsilon$$

Where:

$D_{i,t+1}$ is the scope of giving by all philanthropists in county i in year $t+1$. $Mass_shoot_{i,t}$ is the number of mass shooting events that occurred in county i at year t . $Mass_shoot_{j \neq i,t}$ is the number of mass shootings in counties bordering or nearing county i within a radius of up to 3000 km.⁷² $X_{i,t}$ is a vector of socio-economic, demographic, and political control variables in county i at year t , that vary across space and time (such as adjusted gross income, voting preferences, or number of firearms). μ_i is a geographical fixed effect unique to state i , and τ_t is a year fixed effect. Accordingly, our main coefficients of interest are α and β . While α remains the coefficient for the direct effect of mass shooting on the local affected community, the β coefficient allows us to test the effect of mass shootings that occur outside the local community, on charitable giving. The segment of the equation $\sum Mass_shoot_{j \neq i,t} | r \leq 3000$ allows us to test the effect of mass shootings on charitable giving in counties where mass shootings did not occur, thus, isolating this effect for counties where the mechanisms of blame and conservation of resources are less likely to be in effect due to the distance from the event.

⁷² The results are robust to other ranges of radius distances and are available upon request.

Ideally, we would have estimated a model in which β captures the effect of all mass shootings which occur at year t outside county i , yet this is technically impossible as it would be collinear with the time fixed effects. Therefore, limiting the radius and aggregating events to a distance of 3000 KM from the affected county, solves the collinearity problem while keeping the basic approach that allows us to estimate the effect of mass shootings on philanthropy in counties outside of the victim county. More than 95% of counties are located at a distance of up to 3000 KM from each other, however, our results are robust to other ranges of radius distances and are available upon request. Standard errors are clustered at the county level, as this is the level in which treatment of mass shooting events are applied (Abadie et al., 2017).

Row 1 in Table 2 presents the coefficient for *Shootings* which is the number of mass shootings that occurred in the county. Row 2 shows the coefficient for *Shootings-Out* which is the number of mass shootings that occurred within a distance of 3000 KM from the affected county. All models include state and year fixed effects.⁷³

Interestingly, when measuring the effect of mass shootings on charitable giving by the geographical distance of these events, we find a negative and statistically significant effect on the amount of dollars donated within the county (row 1 of Table 2). However, the coefficient for mass shootings in outside counties (row 2) is positive and statistically significant and is consistent with our main specifications model (at the state level). These findings suggest that the local community reacts differently to a mass shooting when compared to the surrounding communities, by reducing charitable contributions. However, the total average effect is still positive due to the positive response by communities not directly affected, multiplied by the greater number of surrounding communities.

Theory suggests that when responsibility for the source of an extreme event can be tied to factors from within the affected community, empathy tends to diminish and a decrease of prosocial behavior becomes plausible. Bieneck and Krahe (2011), in research on rape victims, showed that victims are blamed more, the closer a prior relationship between the victims and the perpetrator. It is possible that traumatic events are more tangible to the local

⁷³ Due to insufficient variation in mass shootings at the county level in our data, we are unable to include county fixed effects. In order to control for geographic variation, we include state fixed effects. In addition, we cluster our standard errors at the county level as recommended by Abadie et al. (2017).

community within a county, since as mentioned before, counties are relatively smaller units and homogenous, thus the tendency toward blame within the affected community is more probable. Kogut (2011) summarized this theory: "...when the victim is perceived as responsible for his/her plight, identifiability decreases helping...attribution of blame mediates the identifiability effect such that an increase in blame decreases helping an identifiable victim". The COR model suggests that those who were exposed to fatal traumatic events are also more likely to feel vulnerable and threatened by the potential loss of emotional and material resources. According to the combination of these theories, the households in the affected county are expected to be less inclined to donate. In addition, according to the Diffusion of Responsibility theory, it is possible that residents of the affected county diffuse responsibility assuming that others will provide help, while those who live in distant counties would not necessarily be subject to this effect, and therefore increase their philanthropic behavior.

Another interesting result is related to the political variable. The predicted coefficient of *Republican* is positive and statistically significant indicating that counties where the majority of voters are Republican leaning are found to be more generous. There are several possible explanations for these results which have been discussed in the literature. Firstly, differences in giving patterns between Republicans and Democrats may be observed due to differences in income and wealth. Since we control for income, this is unlikely to be the driving mechanism in our analysis. Secondly, such differences may emerge due to differences in policy agendas. Republicans and Democrats both support prosocial behavior such as helping the poor (Campbell and Sances, 2013), yet Republicans are more likely to favor private charities than governmental intervention (Brooks, 2006). Thirdly, these results may be driven by differences in religiosity levels, with Republicans considered to be more religious than Democrats. As some religious affiliations require or encourage charitable giving to churches and other religious organizations, Republicans may be found to be more generous than Democrats. In a recent study, this mechanism was found to be the most salient (Margolis and Sances, 2017). Unfortunately, our data does not include information about religiosity, and thus we cannot test this mechanism.

Table 3 presents our county level analysis which we extended to focus on politics. As mentioned earlier, there exists a complex relationship between firearms, mass shootings,

politics and charitable contributions. In order to investigate this relationship, we use county level voting data for both the presidential and the gubernatorial elections,⁷⁴ and define the following indicator variables (models 1-2 in Table 3): *Republican-President* and *Republican-Governor*, are each equal to 1, if the majority of the voters in the county voted for the Republican nominee in the most recent presidential and gubernatorial elections, respectively.

Presidential elections occurred in all counties and states at the same time, while gubernatorial elections occurred at different times across states.⁷⁵ This variation across states and time, and the differing factors influencing political affiliation at the state and presidential level allow us to estimate these variables separately.⁷⁶ Finally, we define *Republican President & Governor*, which is equal to 1 if the majority of voters in the county voted for both a presidential and gubernatorial Republican candidate in the most recent respective elections, and 0 otherwise (model 3). This variable indicates strong Republican leanings of the county's residents at both the state and federal level.

The effect of mass shootings on charitable contributions is virtually unchanged from our baseline model. The political indicators across all models are positive and statistically significant. To put this in perspective, Republican affiliated counties contributed 1.02 to 2.08 million dollars more on average than Democratic affiliated counties (depending on the chosen model).

In columns 4-6 we present interaction terms between political affiliation and mass shootings which occurred within the county. This allows us to test for differing effects of mass shootings on charitable contributions conditional upon the political affiliation of the majority of the counties' residents. The interaction terms are positive in all models and statistically significant in columns 5 and 6. The combined magnitude of our variables of interest (mass shootings, political indicators and interaction terms) suggests a net positive effect in Republican affiliated counties. Focusing on model 5 for example, the combined net effect of a mass shooting occurring in a county which voted for the Republican

⁷⁴ As Washington DC is not a state, it has no governor. Instead, we use voting data for the office of mayor of the District of Columbia, as it's mayor is considered equivalent in many aspects to a state governor.

⁷⁵ For example, in our sample period, Texas had four gubernatorial elections: 2002, 2006, 2010, 2014. New Hampshire had seven gubernatorial elections: 2002, 2004, 2006, 2008, 2010, 2012, 2014.

⁷⁶ For example, while California voted for Democratic candidates in all presidential elections in our sample period, both Republican and Democratic governors held office during this time.

gubernatorial candidate is an increase of 12.9 million USD in charitable contributions, while in a county which voted for the Democratic gubernatorial candidate is a decrease of 59.6 million USD in charitable contributions. It is also possible that Republican leaning donors contribute more as they do not attribute mass shooting events to the proliferation of firearms in the local community, and therefore the victims and the affected communities are not to be blamed and held responsible for the tragedy.

5.3. Crime

Mass shootings are a subset of the most heinous of crimes - murders. In the background section of this paper we have argued that although mass shootings are murders, their effect on the populace in general, and on charitable and prosocial behavior in particular, is most likely unique and different from other types of murders due to the impact of large and extensive media attention following mass shooting events. The literature investigating the relationship between crime and monetary donations is scarce and no evidence was found for such a relationship (Britto et al., 2011). Table 4 presents various models which test the sensitivity of our main specification results to other types of crimes, hence we include the yearly number of various types of crimes reported in each state as control variables. The information about the number and type of crime is collected and reported by the FBI at the state level in its annual publication - Uniform Crime Reporting Program (UCR).

In all our models, the coefficient of mass shootings remains positive and statistically significant even after accounting for the corresponding levels of criminal activities. The estimated magnitude of the effect of mass shootings on charitable contributions is positive and qualitatively similar to the one reported in the first column of the table, where we do not control for the type of crime. This result does not depend on the particular type of crime analyzed, as the result holds true for crime altogether as well as violent and property crimes separately.⁷⁷

One might argue that mass shootings are similar or correlate with other types of crimes. If this was the case, then the estimated coefficients of mass shooting could have been biased as they would include the effect of other types of crime. Controlling for different criminal

⁷⁷ Violent crimes include murder, rape, robbery and aggravated assault. Property crime includes burglary, larceny and motor vehicle thefts.

behavior allows us to isolate the effect of mass shootings on charitable contributions from the effect of other types of crime and therefore to refute this concern. For example, the inclusion of the total number of violent crimes in the state has a negligible effect on the estimated coefficient of mass shootings, as the difference is statistically insignificant ($p=0.97$)⁷⁸ and is not contributing to the overall effect on philanthropic donations separately (the difference between the coefficient of mass shootings without the inclusion of crime and the inclusion of all and property crimes is also statistically insignificant with $p=0.47$ for both). These results emphasize the salient distinction between mass shootings and other types of crimes, and strongly support our claim that mass shootings present a unique and distinct phenomenon.

After we have established the distinction between mass shootings and other forms of criminal behavior and have shown mass shooting's unique relationship to prosocial behavior, we further investigate the relationship between mass shootings and antisocial behavior. If one was to view charitable contributions and criminal activity as extreme ends on the spectrum of social behavior, the first being prosocial and the second antisocial, then a positive effect of mass shootings on prosocial behavior may indicate a negative effect of mass shootings on antisocial behavior. In Table 5 we test this conjecture, whereby we use state's annual crime rates (per 1,000 residents) as dependent variables in the year following mass shootings.⁷⁹

A common perception about social behavior in disaster events is that individuals exploit the chaotic situation and the survivors' vulnerability and become hostile and aggressive towards one another. It is suggested that under extreme and traumatic circumstances, antisocial behavior such as looting, violent crime and exploitive behavior increase. However, studies about disasters in the United States refute this image, arguing that in emergency periods this behavior is found to be rare, and in the aftermath of disasters altruism and prosocial behavior more often prevail (Heide, 2004; Rodríguez et al., 2006; Scanlon et al., 2014).

⁷⁸ The difference between the coefficient of mass shootings without the inclusion of crime and the inclusion of all and property crimes is also statistically insignificant with $p=0.47$ for both.

⁷⁹ Contemporaneous models were also estimated. The results are virtually identical and are available upon request from the authors.

Our results suggest a null effect of mass shootings on crime rates, regardless of the type of crime. A possible explanation for this result could be that mass shootings increase charitable contributions through the mechanisms we have discussed earlier in our theoretical and conceptual framework – mainly identification with the victims and TMT. These mechanisms appear to be unrelated to antisocial behavioral response.

5.4. Mass shooting types

This section aims to answer the question of how different types of mass shooting events affect prosocial behavior. Since we find blame to be a key factor in determining behavioral response by individuals to mass shootings, it is possible that the context of the event (i.e., the type) might evoke different perceptions of blame. Accordingly, we would expect blame to diminish in situations where the victims' attendance could not have been avoided (for example in schools), versus situations where victims could be perceived as partially responsible for the tragic outcome (such as in the case of neighbors' disputes), when the blame mechanism may come into effect and overcome feelings of empathy.

In Table 6, we provide further analysis, using different types of mass shootings, stemming from the characteristics of the shooters or the location in which the shooting occurred. Column 1 presents our main model, replicating column 8 of Table 1. Column 2 presents the estimated coefficient for events which occurred in schools. The coefficient is positive, statistically significant and higher than the main model predicted coefficient, indicating that donors are more sensitive to mass shootings in public locations and specifically to events where child victims are involved. In addition, schools are an example of a location where attendance is mandatory. Therefore, victims cannot avoid the tragic event, as opposed to other locations which are attended by choice (e.g., malls, theatres, etc.). Both the involvement of children and the nature of the location are associated with heightened empathy and a reduction of the blame mechanism, resulting in an increase in the scope of giving.

Column 3 shows the estimated coefficient for mass shootings performed by adult shooters (18 years or older). The coefficient is positive, statistically significant and higher than the main model coefficient. It seems that unlike in the case of mass shootings performed by juveniles, which might evoke some blame towards the parents or the

educational system, here, it is less likely to find someone specifically on which to put the blame, other than the society as a whole of which donors are a part. Thus, in such cases, heightened empathy tends to overcome blame and increases philanthropic behavior.

Column 4 tests the effect of mass shootings on charitable giving in the case where a shooter was fired from his or her workplace. This type of event provides an additional dimension, as presumably there is a clear cause for the event. It can possibly be perceived as an act of revenge by the shooter against his or her former employers, which is unjustly performed against uninvolved victims. The salient lack of a direct link between the perpetrator and the victims, emphasizes the sense that this type of event could happen to anyone who happened to be in the wrong place at the wrong time. An increase in charitable giving in this case is probably not only due to empathy with the victims, but an act of social solidarity as well.

The last column of Table 6 presents the estimated coefficient for mass shootings which occurred due to social disputes (e.g., neighbors' conflict). As expected, the coefficient estimate shows a decline in contributions following such events. The theories of blame provide once again a possible explanation for the negative result of this particular type of event. These events tend to be perceived by the public as a localized private dispute between two parties which translates into blame, attributed directly to the parties involved. In such cases, the sense of blame offsets and overcomes the empathy toward the victims and reduces the willingness to contribute.

5.5. Philanthropy variations

Since theory suggests that there might be substitution between different types of philanthropic and prosocial behaviors, Table 7 presents eight different variations for measuring our dependent variable - philanthropy. Column 1 presents our main specification model (similar to Column 8 of Table 1).

Column 2 tests the contemporaneous relationship between mass shootings and giving (in the same year) as a robustness check to our preferred model results (where the explanatory variables are lagged). The estimated coefficient remains positive, statistically significant and is about half in magnitude compared to that of our main model coefficient. Under the assumption that donations and mass shootings are distributed on average equally throughout

the year, this result is consistent with our main model results, showing a positive and statistically significant relationship between mass shootings and charitable contributions.

In column 3 we test whether the effect of mass shootings on contributions could be non-linear, by using the natural logarithm of charitable contributions as the dependent variable. This kind of model assumes that a mass shooting event would have a greater effect on large donors and would therefore be proportional to the state's contributed amount (as opposed to a fixed incremental amount). The estimated coefficient indicates that an additional mass shooting event is associated with a 1.35% increase in charitable contributions. This result is in line and emphasizes our main finding of a statistically positive effect of mass shootings on charitable giving.

Allegedly, we could have assumed that the increase in donations is due to larger amounts contributed by existing donors. However, it is possible that such traumatic events drive individuals who had not previously engaged in philanthropy to join the giving circles. The SOI data includes, in addition to the annual total monetary contribution amounts in each state, the number of individuals and households who reported charitable contributions. This is a measure of the number of donor households in each state. The positive and statistically significant coefficient in Column 4 indicates that each additional mass shooting event relates to an increase of 8,500 new donor households on average. In other words, mass shootings not only increase the scope of giving by existing donors, but also increase the number of new individuals and households engaging in philanthropic activity.

In column 5 the dependent variable and all control variables are in state's means and the regressions are weighted by each state's population. We show that even when data is normalized by the states' total population, mass shootings are associated with a statistically significant increase in charitable giving. The estimated coefficient indicates that a mass shooting is associated with an \$11 increase in contributions per capita.⁸⁰ For example, an additional mass shooting in California translates on average to a 429 million USD increase in charitable contributions in that state.

In column 6 we use the amount contributed and the adjusted gross income to create a new variable of contributions relative to income which we define as "state generosity", as

⁸⁰ One should be careful interpreting this finding as a relationship between mass shootings and charitable giving on individual level, since the data is aggregated on the state level and is subject to "ecological Fallacy" risk.

is customary in the philanthropic literature. Although our data is not detailed enough to investigate the generosity of individual philanthropists since it lacks crucial information about their wealth, annual income and charitable giving, it provides us a proxy measurement at the state level. The estimated coefficient is positive and marginally significant, indicating that on average mass shooting relates not only to an increase in charitable giving, but also to an increase in contributions as a percentage of the reported income.

In columns 7 and 8 we use the total number of volunteers reported in each state (by year) and volunteer hours respectively, retrieved from “Volunteering in America”.⁸¹ In these models we divided these measures by the total contribution amount per capita, in order to construct new variables indicating the number of volunteers and volunteer hours per dollar contributed, so as to model possible substitution effects between monetary and non-monetary contributions. The estimated coefficients indicate that indeed, mass shootings are associated with a relative decrease in the number of volunteers compared to the amount of charitable contributions per capita. This result is in line with Freeman's (1997) study, finding evidence for labor supply substitution effect in hours volunteered relative to charitable donations.

A possible explanation for this result could be that individuals might prefer to contribute money rather than time due to the geographical distance constraint, or due to the lack of professional qualifications required for assistance when mass shootings are involved. Other studies that investigated the trade-off between giving time and money are scarce and yielded mixed results (Bekkers, 2001; Freeman, 1997; Lee et al., 1999; Reed et al., 2016). A common belief is that volunteering has a significant role in the development of a healthy society. Indeed, in many cases volunteer activity is crucial (for example collecting and delivering food and clothes to the needy), yet in the case of mass shootings, the need for non-professional volunteers is questionable. However, it is possible that raising monetary contributions to provide professional treatment and rehabilitation services (e.g., psychologists and social worker) could better benefit the victims and the affected community.

In this section, we have provided further evidence to our main model results that mass

⁸¹ Unlike the monetary data which was retrieved from administrative datasets, volunteering data is based on surveys and questionnaires and therefore may be subject to a survey biases.

shootings increase monetary contribution, by testing the relationship between mass shootings and philanthropy over several different variations of the dependent variable. In addition, we provide an indication of an increase in the number of individuals engaging in philanthropic activity following these traumatic events.

6. Robustness and Falsifications

As presented earlier, our main model results show that each additional mass shooting event is associated with an increase in charitable giving. In order to further strengthen our results and to verify the sensitivity of our findings, we perform a series of robustness and placebo tests. In our robustness analyses, we include alternate measures for donations as well as for measuring the extent of the mass shooting events, and we test our results' robustness to alternate specifications, econometric models, including non-linear models and to alternative data source of mass shootings. Additionally, Placebo falsification tests were used to address endogeneity concerns and reject the possibility of reverse causality.⁸² All the results are highly robust and support our main model's findings. The results are not presented and available upon request.

7. Conclusions and Discussion

This study has assessed empirically the relationship between mass shootings and charitable giving by individuals and households in the United States over a period of 12 years between 2004-2015. Our main results show that the effect of mass shootings on charitable giving in the local victimized community is negative and statistically significant, while it is found to be positive and statistically significant in surrounding communities, leading to an average total positive effect (at the state level). In other words, the locally affected community reacts differently to mass shootings when compared to the surrounding communities' prosocial behavior, by reducing charitable contributions. A plausible explanation for this finding could be elucidated by the blame theory which suggests that in the affected communities, victim blaming tends to overcome prosocial behavior (as might have been predicted by TMT and the identifiable victim effect theory), and accordingly diminishes empathy

⁸² The inclusion of other major events into our model, such as natural disasters, doesn't alter our results, and the coefficients for mass shootings remain qualitatively similar.

towards the victims, which translates to a decrease in charitable giving within the victimized communities. It is also possible that residents of the affected community diffuse responsibility assuming that others will provide help, and therefore would be less likely to donate. Our findings are robust across a multitude of model specifications and different measures of both mass shootings and philanthropy. We provide further evidence to the blame mechanism as we show that when mass shooting events occurred in instances that could have been avoided such as the cases of neighbor disputes, prosocial behavior decreases, as opposed to events that occurred in locations where victims' attendance was mandatory, such as schools.

Communities characterized by a higher proportion of Republican voters and those with higher gun ownership are found to be more generous, contributing on average larger amounts following mass shooting events. A possible explanation for this finding might be due to political divide on the subject of the second amendment (i.e., gun control and gun ownership) and its' relation to the public discourse regarding mass shootings. The underlying mechanism for this could be that Republican leaning donors do not attribute mass shooting events to the proliferation of firearms in the local community, and therefore the victims and the affected communities are not to be blamed and held responsible for the tragedy.

Additionally, we show that mass shooting is a distinct phenomenon unlike any other type of crime, and its effect on prosocial behavior is unique compared to other types of criminal activities, including violent offences such as murder. The effect of mass shootings on philanthropy remains positive and statistically significant, even after accounting for different types of crime. Testing for various criminal activities, we find crime to be unrelated to charitable giving. The distinct effect of mass shootings as opposed to other types of crime is possibly driven by the large and extensive media attention following such events. We further show that mass shootings appear to be unrelated to other antisocial behavioral activity as our results suggest a null effect of mass shootings on crime rates, regardless of the type of crime.

In the aftermath of tragic events, societies have developed mechanisms for aid and relief for victims and the affected community. There is a long-standing debate whether such activity should be under the state's responsibility similar to other public goods, or provided

by non-governmental organizations which rely on the generosity of individuals. In some cases, governments deliberately shift some of their social responsibilities to civil organizations, and in other cases such organizations fill the vacuum of inadequate services that should have been provided by the government. The results of this study show that in the unique case of mass shooting, unlike any other type of crime, social responsibility and solidarity come into effect and on average willingness to help increases, both in the amount donated and in the number of individuals engaging in philanthropic activity, especially when blame is not attributed to the victims or to the affected community. However, this prosocial behavior is implemented through monetary contributions and does not translate to volunteer activity.

The decrease in philanthropic behavior within the locally affected community could be a warning of broader social implications which should be a concern for professionals and policy makers. These include the damage to the affected community's social fabric, polarization and decline of residents' trust in their neighbors, decrease in solidarity, social cohesion and the willingness of one to intervene for the common good. A possible policy intervention should be not only focused on the individual victims and their families, but extended to the local and surrounding communities as well. Tax incentives and monetary matching programs can be useful tools to encourage contributions in both local and external communities. Treating mass shootings in a similar fashion to "disaster event" will allow the allocation of resources for coping with traumatic results in the aftermath of these tragedies. These measures might also be helpful in encouraging relief organizations (as well as other non-profit organizations) to increase their involvement in the affected areas, and to specialize in this specific field.

Table 1. Mass shootings and contributions by states

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Contributions amount (t+1)							
Shootings	326525.1*	264083.3*	240426.2*	187302.2**	197619.0**	209031.0**	209001.6**	207931.4**
	(180364.8)	(133130.0)	(131596.1)	(80013.4)	(76716.7)	(83859.9)	(83885.1)	(84176.4)
AGI		0.0148***	0.0135***	0.0182***	0.0160***	0.0165***	0.0165***	0.0164***
		(0.00221)	(0.00347)	(0.00568)	(0.00506)	(0.00441)	(0.00440)	(0.00443)
Population			159.9	-517.2	-474.0	-287.5	-288.6	-284.6
			(165.8)	(590.6)	(566.8)	(545.3)	(544.8)	(545.4)
#Poor				1497.2*	1649.8*	1976.1**	1985.6**	2001.8**
				(884.5)	(919.6)	(796.9)	(798.0)	(766.5)
Unemployment rate (%)					-124425.7*	-122686.3*	-123043.0*	-116686.4*
					(65565.1)	(64899.9)	(65229.6)	(67123.3)
BA or higher						-805.8**	-803.4**	-807.1**
						(337.6)	(337.8)	(339.5)
NICS							643954.6**	587552.1*
							(309481.9)	(325381.4)
Republican								134994.6
								(124969.2)
Constant	4448304.2***	1923390.6***	1203986.6**	3296336.5†	3955167.3*	3384309.4†	3359196.6†	3234017.1
	(93395.9)	(369980.7)	(524437.3)	(2131714.9)	(2315086.5)	(2266585.9)	(2261658.9)	(2300166.8)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	539	539	539	539	539	539	539	539
R ²	0.255	0.355	0.358	0.385	0.400	0.406	0.407	0.408

Standard errors clustered at the state level in parentheses

†p<0.15 * p<0.1 ** p<0.05 *** p<0.01

Table 2. Mass shootings and contributions – by counties

Dependent variable:	(1)	(2)
	Contributions amount (t+1)	
Shootings	-26038.8** (12541.6)	-25275.3** (12517.5)
Shootings-Out		738.1*** (216.2)
AGI	0.0168*** (0.00309)	0.0169*** (0.00310)
Population	182.9† (126.7)	179.5 (127.4)
# Poor	-237.2 (264.7)	-226.9 (266.8)
Unemployment rate (%)	-411.2* (213.9)	-343.4† (221.3)
BA or higher	742.9*** (170.2)	756.5*** (171.3)
NICS	160.1*** (23.95)	165.5*** (24.56)
Republican	1460.4** (624.1)	1420.6** (621.4)
Constant	9230.0* (4841.0)	7490.4† (4904.9)
Year FE	Yes	Yes
State FE	Yes	Yes
Observations	33992	33992
R ²	0.0431	0.0432

Shootings = mass shootings in county;

Shootings-Out = total mass shootings in counties up to a distance of 3000 km donor's locality; Standard errors clustered at the county level in parentheses;

† p<0.15 * p<0.1 ** p<0.05 *** p<0.01

Table 3. Mass shootings, contributions and politics – by counties

Dependent variable:	(1)	(2)	(3)	(4)	(5)	(6)
	Contributions amount (t+1)					
Shootings	-25275.3** (12517.5)	-25179.0** β(12484.1)	-25209.7** (12518.4)	-37219.5** (18436.0)	-59560.5*** (17702.0)	-38506.0** (16078.0)
Shootings-Out	738.1*** (216.2)	736.5*** (215.6)	743.0*** (216.7)	754.0*** (220.2)	730.2*** (215.0)	750.5*** (218.5)
Republican President	1420.6** (621.4)			1363.3** (608.6)		
Republican Governor		2086.4* (1143.5)			1915.7* (1122.5)	
Republican President & Governor			1027.9** (514.6)			981.4* (512.8)
Shootings × Republican President				27288.5 (22648.9)		
Shootings × Republican Governor					70637.3*** (18534.4)	
Shootings × Republican President & Governor						40897.7** (17245.0)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33992	33992	33992	33992	33992	33992
R ²	0.0432	0.0428	0.0433	0.0444	0.0431	0.0433

Shootings = mass shootings in county;

Shootings-Out = total mass shootings in counties up to a distance of 3000 km from county;

Republican President = 1 if county voted for a Republican presidential candidate in most recent elections;

Republican Governor = 1 if county voted for a Republican gubernatorial candidate in most recent elections;

Republican Governor & President = 1 if county voted for both a Republican gubernatorial and presidential candidate in most recent elections;

Standard errors clustered at the county level in parentheses;

* p<0.1 ** p<0.05 *** p<0.01

Table 4. Accounting for other criminal behavior

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Contributions amount (t+1)							
Crime type	Aggregated				Violent Crimes			
Crime variable	None	All crimes	Violent crimes	Property crimes	Murders	Rapes	Aggravated assaults	Robberies
Shootings	207931.4** (84176.4)	195474.2** (77761.8)	208254.2** (90296.3)	194451.8** (76259.7)	210573.5** (91355.0)	217149.4** (96419.1)	214311.7** (101457.4)	223504.4** (97562.6)
Crime		5.471 (5.491)	36.88 (34.02)	5.897 (5.964)	1084.1 (2280.2)	219.8† (141.5)	92.34† (60.58)	-147.8 (107.1)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	539	539	539	539	539	539	539	539
R ²	0.408	0.431	0.423	0.430	0.413	0.421	0.462	0.443

Standard errors clustered at the state level in parentheses

† p<0.15 * p<0.1 ** p<0.05 *** p<0.01

Table 5. Mass shootings and antisocial behavior

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Contributions amount (t+1)	Crime rate (t+1)	Violent crime rate (t+1)	Property crime rate (t+1)	Murder rate (t+1)	Rape rate (t+1)	Aggravated Assaults rate (t+1)	Robbery rate (t+1)
Shootings	207931.4** (84176.4)	0.297 (0.261)	0.0467 (0.0444)	0.250 (0.241)	-0.00249 (0.00152)	0.00553 (0.00713)	0.0434 (0.0377)	0.000219 (0.0230)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	539	539	539	539	539	539	539	539
R ²	0.408	0.574	0.380	0.570	0.142	0.380	0.254	0.507

Standard errors clustered at the state level in parentheses

+ p<0.15 * p<0.1 ** p<0.05 *** p<0.01

Table 6. Main variable types

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	Contributions amount (t+1)				
All shootings	207931.4** (84176.4)				
School shootings		215527.6** (93547.0)			
Adult shooter			237381.6** (96338.4)		
Shooter fired from workplace				268921.8*** (56728.7)	
Shooting due to social dispute					-231350.9** (111199.8)
Control Variables	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes
Observations	539	539	539	539	539
R ²	0.408	0.400	0.410	0.402	0.399

Standard errors clustered at the state level in parentheses.

* p<0.1 ** p<0.05 *** p<0.01

Table 7. Dependent variable variations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable:	Contributions amount (t+1)	Contributions amount (t)	Log contributions amount (t+1)	#Returns reporting contributions (t+1)	Contributions amount per capita (t+1)	Generosity (t+1)	#Volunteers (t+1)	#Volunteer hours (t+1)
Shootings	207931.4** (84176.4)	92743.07 ** (36808.75)	0.0135* (0.00725)	8499.8* (4254.3)	11.04*** (3.274)	0.0341† (0.0223)	-91.67* (46.45)	-10718.7 (9420.4)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	539	588	539	539	539	539	539	539
R ²	0.408	0.720	0.074	0.623	0.351	0.078	0.468	0.248

Model 5 and has all control variables (excluding Republican) in state-averages and is weighted by state population.

Model 6 dependent variable is contributions amount divided by AGI.

Model 7 dependent variable is number of volunteers divided by contributions amount.

Model 8 dependent variable is number of volunteering hours divided by contributions amount.

Standard errors clustered at the state level in parentheses.

† p<0.15 * p<0.1 ** p<0.05 *** p<0.01

The previous chapters presented different types of punctuated external extreme events which cause stress and affect prosocial and antisocial behavior of individuals and communities, measured by charitable giving and crime rates. The last chapter focuses on a long-term stressful life choice changing event, investigating the relationship between the assimilation process of immigrants in Israel and philanthropic behavior, over the last decade.

Chapter 4 – Immigration, assimilation and philanthropy: A longitudinal study

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Status: Under review

Immigration, assimilation and philanthropy: A longitudinal study

Abstract

The heterogeneity of the Israeli population and the special characteristics and diversity of Israeli society, which include migration from both wealthy and poor countries, allow for a unique opportunity to study the relationship between immigration and philanthropic behavior. Using a unique panel dataset of all tax itemizer donors between 1999-2011, the study's results show that recent immigrant philanthropists contribute significantly higher amounts than their native-born counterparts and veteran immigrants. However, with each year residing in Israel, assimilating and integrating into its society, their giving patterns decrease, converging to the level of native-born donors. Immigrant donors originating from the United States contribute on average a significant higher amount than donors originating from any other country, are found to be the most generous and consistent donors and are more likely to donate.

Keywords:

Immigration, Assimilation, Prosocial behavior, Philanthropy

1. Introduction

Global migration has played a central role throughout history, shaping human societies and countries to their current form. Migration is a complex phenomenon affecting the immigrants, the country they leave and the country to which they immigrate. Migration has an impact on many aspects of life in the host society such as the labor market, culture, poverty, crime, terror, economy, social cohesion, politics and more. It also has an impact on the immigrant individuals and households, as the process of migration is usually psychologically stressful, and in many cases can be traumatic, even in positive circumstances (Levers & Hyatt-Burkhart, 2012).

Israel, as a relatively young state, has experienced many immigration waves from all over the world. Since its establishment (1948) until today, about three million individuals have immigrated to Israel.¹ The last significant immigration wave included about one million individuals over a period of less than a decade during the years 1990-1999, making up about 20 percent of the population at that time, most of them from the former Soviet Union (after liberal reforms were implemented at the end of the 1980s).² Since the year 2000, positive immigration flows to Israel have continued every year, but in smaller numbers, (during 2000-2009 about 268,000 individuals immigrated to Israel).² Although the impact of the immigrant influx is salient in many fields such as the labor market, education and macroeconomics, its effect on philanthropy has hardly been explored.

The question of whether immigrant status affects one's philanthropic propensities in the host country is part of a broader study of the economic, sociological, and cultural aspects of immigration. Learning about the charitable patterns of new immigrants is of interest for a variety of reasons. From a theoretical perspective, we are interested in knowing whether this effect exists, and from a policy perspective, we would like to know how to best assimilate new immigrants, and how to maximize their scope of giving. This information will help decision makers and professionals obtain a better understanding about new immigrants' socio-economic status, taking into account their potential contribution to society while designing immigration and assimilation policy. While informal giving by immigrants to their relatives in their country of origin or to their own community in the host country (mainly by those who came from developing countries) is well documented

(Osili & Du, 2005; O'Neill & Roberts, 2000), formal charitable giving by immigrants to causes beyond their own communities indicates a step forward in the process of integration and a sense of belonging with their new home, and could be a useful indicator in assessment of immigrant assimilation. On the other hand, while philanthropy can serve as a platform for integration and leverage assimilation, barriers and racial/ethnic discrimination towards certain immigrant groups might block assimilation and motivation for volunteering and donating to the general host community (Brown & Bean, 2006).

Israeli society has several unique characteristics that differentiate it from other advanced economies and make it an ideal setting for studying immigration and philanthropy. Founded by immigrants from the Jewish diaspora, Israeli society today is comprised of native-born Israelis, Jewish immigrants and various ethnic minorities. These groups differ in their traditions, institutions, cultures and interests. The share of foreign-born in the population in Israel is among the highest in developed countries as of 2018, and was the highest in 2000 (OECD, 2019). Also, unlike other advanced economies whose vast majority of migrants come from poorer countries, Israel has attracted migrants from richer countries such as the United States, France and the United Kingdom. The large share of foreign-born in the Israeli population, and the heterogeneity in their countries of origin, allow for a unique opportunity to study issues such as the differences in giving between natives and foreign-born, and differences in charitable contributions between immigrants from various countries.

2. Theory and Conceptual Framework

In order to understand the relationship between immigration and philanthropy, it is important to address the concepts and models of assimilation. Alba and Nee (1997) refer to the early definition of assimilation set forth earlier by Park and Burgess (1969) as a process of interpenetration and fusion in which persons and groups acquire the memories, sentiments, and attitudes of other persons and groups, and by sharing their experience and history, are incorporated with them in a common cultural life. Berry (1997) frames the discussion about assimilation in the cultural context and refers to the term *acculturation* – the cultural changes of groups or individuals that result in first hand contact and encounters

with other groups. Assimilation theories offer an appropriate benchmark framework for analyzing the relationship between immigration and philanthropy.

The Classic Model of Assimilation describes the process of two groups – immigrant and majority – as following a linear convergence, in which their values, norms, and behaviors become similar over time (Bashi & McDaniel, 1997). According to Brown and Bean (2006) one would expect those immigrants residing the longest in the host society to show greater similarities with the majority group than immigrants who have spent less time in the host society. The base assumption in this model is that immigrants arrive with a relative disadvantage to the local native-born population, but are assumed to have the potential to be like the native-born or majority group. As time passes, immigrants' education increases and they are exposed to better economic opportunities which translate to social mobility and integration (Bashi & McDaniel, 1997). According to this theory, it is expected that the longer immigrants reside in the host country, as they become more integrated and assimilated in the host community, their philanthropic behavior would become similar to that of the majority group.

Social approval theory also provides a theoretical framework to explain why individuals contribute to others in the apparent absence of material reward. It states that one's need for social approval acts as an incentive for prosocial behavior (Satow, 1975). Studies show that social approval increases the contribution rate of public goods even among strangers (Kurzban et al., 2007; Bateson et al., 2006; Rege & Telle, 2004). It was also found that the impact of social approval is stronger for those in need of approval (Deutsch & Lambert, 1986).

Additionally, Social capital theory is also used in this study as a theoretical framework to investigate donors' characteristics. Social capital includes (among other factors) a set of social networks in communities and social groups, where values of trust and mutuality serve as the basis for collective activity (Mesch et al., 2006; Brooks, 2005). Social capital theory is found to be an important predictor of prosocial behavior (Wilson & Musick, 1997; Musick et al., 2000; Bryant et al., 2003). Studies show that individuals with larger and more diverse social networks tend to be more generous (Bekkers & Schuyt, 2008; Brown & Ferris, 2007; Bryant et al., 2003). Philanthropic behavior is not determined by personality characteristics only, but also influenced by the context and situation in which

charitable giving is displayed (Wiepking & Maas, 2009). Thus, both theories suggest that immigrant donors accelerate their integration and assimilation process in the host society through philanthropic activity and use it as an entry ticket to develop a social network with other local elite groups in order to aid their assimilation process in the host country.

3. Related literature

The quantitative literature available about the link between immigration and philanthropy is relatively scarce. According to several studies, immigrants in the United States, Australia and Switzerland, are less likely to donate as much as native residents, but their likelihood of giving increases over time. Immigrants tend to give less and are less likely to make a formal contribution. As time passes, immigrants change their giving and volunteering patterns, their contributions increase with the number of years residing in the host country, and their charitable giving levels converge to the level of the native donors (Joseph, 1995; Mata & McRae, 2000; Osili & Xie, 2009; Brown & Bean, 2006; Thomas, 2012; Nesbit et al., 2013). Joseph (1995) argued that there are assimilation effects on charitable giving. Recent immigrants to the United States bring with them their own culture and tradition of giving which differ from the native-born population. Immigrants contributed smaller amounts on average and were found to be less generous, probably due to residential segregation and lack of social networks. On the other hand, it was argued that immigrants who resided longer in the host country and had a higher socioeconomic status tended to donate more than less established segments of the immigrant population. Mata and McRae (2000), in their research on Canadian philanthropy, similarly found that contributions increase with the number of years residing in the host country and the gap between immigrants and native citizens narrows over time. Philanthropic behavior (i.e., monetary donations and volunteering) is considered as an indicator for immigrant integration in the host country (Thomas, 2012), and duration in the host country has a positive relationship with philanthropy, since the sense of community and the social network of immigrants expand over time (Nesbit et al., 2013). Osili and Xie (2009) found no significant differences between second and third generation immigrants and native-born American households in their contribution behavior. Studies about volunteering patterns among immigrants suggest that by volunteering, immigrants enhance their social and human capital, which eases the

process of immigration and aids their integration process (Handy & Greenspan, 2009).

In conclusion, immigration is a life changing event that has an impact on both the immigrant and the host community. Integration and assimilation are key for successful absorption in the host country. Based on the conceptual framework, the literature review presented above and our custom-built dataset, this research aims to shed light on the following questions: (1) Do immigrant donors differ from their native-born counterparts with respect to the scope of giving and generosity?³ (2) Do immigrant donors from different countries, especially those from countries with rich philanthropic traditions, differ from one another with respect to the scope of giving and generosity? (3) Do recent immigrants' giving patterns differ from those of veteran immigrants? (4) Does age at immigration affect giving patterns? (5) Are giving patterns of second-generation immigrants similar to immigrants or to second generation native-born donors? (6) Are immigrants more likely to donate than native-born individuals?

This study aims to contribute to the existing literature about the economic and social characteristics of philanthropists, in particular philanthropy among immigrants, and about the assimilation process of immigrants. The findings will benefit both theoretical and policy related aspects of immigrant absorption and bring to light new insights on the role that social identity and cultural origins can play in shaping patterns of charitable giving. The unique structure of Israeli society with regards to immigration, and the custom-built dataset, allow us to reliably test the research questions presented above and offer new and unique findings.

4. Data

The methodology used in this study is based on the analysis of a unique panel dataset of all donors who claimed tax credit for contributions to “qualified” non-profit organizations in Israel during at least one of the following years: 1999, 2000, 2004, 2006-2011.⁴ Philanthropic data was obtained and merged from two sources: (1) the Israeli Tax Authority, and (2) the Israeli Central Bureau of Statistics' (ICBS) Population Registry. This represents the entire population of tax-itemizers donors – 152,728 unique individuals and households who claimed tax credit by submitting tax return reports during this period.⁵ Individuals who

died during the sample period were excluded from the data following the year of death, which brings the total number of observations to 1,359,224.

The chosen independent variables are based on the literature about individual and household giving, along with additional factors that are unique to Israel. The set of relevant independent variables used in this study are: **Immigration variables:** *Immigrant, Place of birth, Father's place of birth, Year of immigration*; **Socio-demographic variables:** *Gender, Age, Marital status, Number of Children, Place of residence, Religion*; and **Economic variables:** *Total annual household Income, Income source (earned or unearned income), and the Industrial classification of the donor's occupation (Manufacturing & High-tech, Banking & Finance, Real Estate, etc.).*

Since giving by non-itemizing households is not included in the dataset, it raises the question of 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 as it focuses on those likely to make substantial donations.

Table 1 presents summary statistics of the donors. In this study, all the amounts in NIS correspond to New Israeli Shekels (NIS) and are indexed to 2011 using the Israeli CPI to 2011 NIS (i.e. in real terms). The average annual contribution was 2,776 NIS (about \$790), though the average positive annual donation was about 7,958 NIS (\$2,265) (not presented in the table). Donors' household average annual income is 307,876 NIS (about \$88,200), about twice the Israeli average income in 2011. The oldest donor is 106 years old, and the youngest donor's age when donating is 18.⁶ The median donation is 0, since many individuals are inconsistent donors who donated only once or twice during the sample period, whereas in the other years they reported no donations. About 34% of the donors were born outside Israel, originating almost equally from America and West Europe, Asia and Africa, and East Europe. About 82% of donors are married and the average number of their children is 2.89. The average donor's age is 48 and 19.10% of the donors are female (In the case of household donations, gender is associated with the head of household).

Table 2 presents trends in charitable giving by immigrant donors compared to their native-born counterparts over the sample period. An exploratory data analysis yields

interesting insights. While the total number of donors claiming tax credit (both native-born and immigrants) more than doubled over the years (from 29,419 individuals in 1999 to 61,036 in 2011) total donations almost quadrupled (in real terms) during that period, possibly linked to economic growth during this period, as measured by the increase in GDP per capita in those years. It is interesting to note a drop in almost every donation indicators in 2008 and to some extent in 2009 as well. In 2010 there was something of a recovery in the donation indicators and 2011 measures exceed all previous years in the dataset. It is possible that these trends are due, at least partially, to the 2008 global financial crisis.

Among donors, in every year in the sample period, immigrants contribute on average larger amounts compared to native-born donors, and are also found to be more generous (annual donation as a share of the reported income). Figures 1 and 2 display trends in the scope of donations and generosity across the sample period.⁷ Immigrant donors are divided into three groups based on their duration of stay (experience) in the host country: (1) those who reside in the host country for up to 10 years since immigration, (2) those who reside in the host country between 11-20 years since immigration (both groups consist of “new immigrants”), and (3) those who reside in Israel 21 years or longer (veteran immigrants). A simple inspection of the figures already reveals that while recent immigrants’ giving indicators are highest, the giving patterns of veteran immigrants, those who reside in Israel over 20 years since immigration, are similar to the level of the native-born donors. Such results however may stem from the correlation between immigrants’ duration and other determinants of charitable contributions such as income. Using econometric multivariate regression models, a more detailed analysis of immigrant philanthropists is presented in the next sections of this study.

5. Methodology

The identification strategy in this study is based on the variation in charitable giving between immigrants and natives, and the gradual assimilation process that immigrants experience in the host country. Variations in immigrant donors’ status yield a natural comparison group comprised of donors who recently immigrated with veteran immigrants and with native-born donors. The unit of observation is a tax itemizer individual donor (or household) and the dependent variable is donation, measured by the scope of annual

monetary contribution in the following year, and by the proportion of income donated which can be interpreted as a donor's generosity.

To estimate the relationship between the independent variables and *donation*, a series of Panel OLS regression analyses were performed. The specifications utilize a panel ordinary least squares framework with both locality and year fixed effects, which mitigate many of the concerns for potential omitted variable bias (all models include standard errors clustered at the individual level, which are robust to arbitrary heteroscedasticity and serial correlation). The year fixed effect allows to control for time specific factors that could influence donors' behavior, such as changes in national tax policy, nationwide political events and other national trends. The locality fixed effect controls for any locality-specific variables that are time invariant and allow us to account for the social community in which the donors reside (Wiepking & Maas, 2009). This approach is described by the following fixed effects model:

$$donation_{ilt+1} =$$

$$\alpha + \beta_1 immigrant_{ilt} + \beta_2 exp_{ilt} + \beta_3 socio_economic_{ilt} + \varrho_l + \tau_t + \varepsilon_{ilt}$$

where:

$donation_{ilt+1}$ is the dependent variable for individual i in locality l in year $t+1$, $immigrant_i$ is a dummy variable indicating if individual i is an immigrant or native-born, exp_{ilt} is immigrants' life experience in Israel based on the number of years they reside in Israel since immigration at year t , $socio_economic_{ilt}$ is a set of socio-demographic and economic variables for individual i in locality l at year t , ϱ_l is a locality fixed effect unique to locality l , and τ_t is a time (year) fixed effect. The empirical strategy utilizes lags of explanatory variables in order to ascertain the chronological order of events. Accordingly, philanthropic donations in any given year are explained via immigration variables in the preceding year (and controlled for with covariates of that preceding year).⁸ This specification is intended to describe the link between immigration and philanthropic behavior, while holding other important determinants of charitable contributions (such as income) constant. The above equation was estimated separately for each of the dependent variables (the scope of giving, and contribution as percentage of income).

6. Empirical results

6.1. Immigration

Table 3 reports the results for the baseline models which aim to answer the first research question - do immigrant donors' giving patterns differ from their native-born counterparts. The table reports the coefficients for being an immigrant donor and the other variables which model the donors' charitable contributions. The first row is the estimated coefficient of *immigrant*, the main variable of interest, which aims to test whether there is an effect to being an immigrant versus a native-born donor. The dependent variable in the first model is the scope of giving (donation) and in the second column, donation as a share of income (generosity). The estimated coefficients of *immigrant* are positive and statistically significant, showing that immigrant philanthropists contribute on average 781 NIS (\$220) more than Israeli-born philanthropists, and are more generous. These results support the hypothesis that immigrant philanthropic behavior is different than that of local donors, probably due to differences in the culture and tradition of giving. Also, the positive sign of the *immigrant* coefficient is somewhat unique in this literature, as most studies find a negative link between migrants and charitable contributions. As detailed in the introduction, Israel stands unique among developed nations by having migrants from both richer and poorer countries, while other western countries' majority of migrants come from poorer countries. This is investigated further in the following subsection.

6.2. Place of birth

A unique advantage of the detailed individual level data is that it contains information not only regarding donors' immigration status, but also their place of birth, with each continent-group containing thousands of individuals and households. This allows us to test for differences between immigrants from different continents, which also correspond to different ethnic groups in Israel: Africa & Asia, Americas & Oceania, Western Europe and Eastern Europe (Dahan, 2013). Immigrants from Americas & Oceania and Western Europe come from countries wealthier than Israel, while immigrants from Eastern Europe and Africa & Asia come from poorer countries. This allows for a different vantage point on immigrants' philanthropic behavior in developed countries, as opposed to previous studies where the vast majority of immigrants come from the developing world.

Preliminary data analysis shows that American & Oceania born philanthropists contributed significantly larger amounts than any other group - an annual average of 17,531 NIS (about \$4,980), and are also found to be the most generous donors. The second most generous group are philanthropists who were born in Western European countries who donated 10,399 NIS on average, (about \$2,736), while those who immigrated from Africa & Asia and from East Europe contributed the least amounts compared to all other donors.⁹

Table 4 presents the results of panel regressions similar to the previous section, but the main variable of interest (immigrant) was further classified to four categories based on immigrants' place of birth (the reference group is native-born Israeli). The results presented show that, after controlling for all variables reported in table 3, immigrant donors from America and West Europe indeed contribute significantly larger amounts on average (NIS 5,290 and NIS 1,453 respectively) compared to all other donors, and are found to be more generous, while those who immigrated from Africa & Asia are found to be the least generous, followed by East European immigrants.

In recent decades, the share of highly skilled immigrants originating from wealthy countries such as the United States, Great Britain and France has increased significantly.¹⁰ These immigrants' human capital is considered higher than those of native Israelis and of other immigrants (Amit, 2012). However, differences in income are an unlikely explanation to the gaps in giving patterns between ethnic groups, as the econometric analyses controls for income (among other socio-economic control variables, such as industrial classification and locality). Thus, a more plausible explanation for this phenomenon could be that recent immigrants arriving in Israel indeed bring with them their own patterns and traditions of giving from their country of origin, which might differ from one another and from the native-born donors. This explanation supports the literature which finds that immigrants bring with them cultural values and norms from their country of origin, including attitudes towards charitable giving, which is commonplace in countries such as the United States in general, and among American Jews in particular. Moreover, it is likely that some of the donors who immigrated to Israel from such countries were previously donors to various causes in Israel, as many Jewish communities donate large amounts to Israel and are thus continuing to donate to similar venues after immigrating to Israel, viewing it as simply

continuing their philanthropic involvement (Fleisch and Sasson, 2012; Shaul Bar Nissim, 2019).

6.3. Immigration dynamic effect

In the previous sections, evidences for differing philanthropic behavior of immigrants compared to native-born donors were presented. This section will explore the differences in trends of giving between immigrant and native-born donors over the sample period. Table 5 presents the results for the full econometric equation which accounts also for life experience duration (*exp*) in the host country. Columns 1-3 and 5-7 present several alternative definitions of life experience for the dependent variables donation and generosity, respectively. The *experience* variable's purpose is to test the relationship between the length of time residing in Israel since immigration, and philanthropy.

In models 1 and 5 of Table 5, *experience (number of years in Israel – up to 20 years)* is a continuous variable whose value ranges between 1 and 20 for individuals and heads of households who were born outside Israel, based on the number of years residing in Israel since immigration. Immigrants who resided in Israel for more than 20 years were classified in the same group as native-born Israelis. The exploratory data analysis shows that giving patterns of veteran immigrants were very similar to those of the native-born donors. The base assumption is that after residing for a significant period in the host country, immigrants gradually acquire knowledge of the language and culture of the host country, and while they may not have assimilated fully, they have integrated to a large degree (Chiswick, 1978). The estimated coefficient of *experience* indeed shows that the longer the immigrant resides in Israel, their charitable giving patterns converge to those of native-born donors, while also controlling for place of birth and all the other factors shown in Table 3.

Models 2 and 6 present a similar approach, assuming assimilation and integration processes is a weighted linear function of the number of years residing in Israel, without truncation at 20 years, such as in models 1 and 5. The purpose of weighting the duration of immigrant and native-born philanthropists differently is to take into consideration the possibility that life experience in the host country is perceived differently by recent immigrants versus native individuals. In models 3 and 7 the immigration experience is

simply the length of time residing in Israel since immigration. The coefficients of *experience* are negative and statistically significant across all models, indicating that the longer immigrant donors reside in Israel, their giving patterns decrease each year, gradually converging to those of the native-born donors, possibly indicating assimilation and integration into the host society. This phenomenon is also presented graphically in Figure 3.

The models variations' results in this section support the main findings of the previous sections that recent immigrant philanthropists in Israel, specifically those who were born in America and West Europe, tend to be more generous and contribute higher amounts than native and veteran immigrant philanthropists, but with each additional year residing in the host country, they tend to reduce the scope of their contributions, converging to the level of their native counterparts. As mentioned earlier, a possible explanation for this phenomenon could be the aspiration of recent immigrants to accelerate their assimilation and absorption into the host society through philanthropy. Through their philanthropic activity, recent immigrants gain recognition from the general public and develop a social network with other local elite groups that can aid in their assimilation process. Another possible explanation is that recent immigrant philanthropists bring with them a philanthropic culture and tradition which, on average, is more generous than the local trend in Israel (the host country). With respect to the gradual decrease in contributions over the years by those who immigrated from America and West European countries, alternative explanations could be related to a possible decline in the wealth¹¹ of the donors over the years, or to tax planning of donors, who, although residing in Israel, prefer to donate in their country of origin.¹²

6.4. Age at immigration

Age at immigration is an important factor in understanding the assimilation and integration process of immigrants. Whether one immigrates at childhood, employment age, or older, age has a direct implication on her or his assimilation in the host country. For example, earnings and cognitive abilities change over time, and older immigrants may find it more difficult to adjust to the linguistic and cultural challenges associated with entering a new country (Schaafsma & Sweetman, 2001).

Columns 4 and 8 of Table 5 present the relationship between age at immigration and philanthropy. The coefficient for the explanatory variable *age at immigration* is positive and statistically significant indicating that the scope of giving and generosity increase as the age at immigration increases. These findings support the vast literature about immigrant assimilation showing that the degree of integration varies inversely with age at immigration, and the age at arrival is a dominant factor determining the outcomes of immigrant adaptation (Friedberg, 1992; Borjas, 1995; Schaafsma & Sweetman, 2001; Gonzalez, 2003; Myers et al., 2009).

6.5. Second generation

Growing up in an immigrant family often involves unique challenges. Many second-generation immigrants face social conflicts and are often forced to decide between solidarity with their ethnic community and preserving their family's culture, tradition and heritage, versus embracing those aspects of their new home, while in many cases being subject to discrimination. In a study of immigrants in the United States, Portes & Zhou (1993) argue that while some immigrant groups rapidly assimilate into the host society, others are more susceptible. In a more recent study, Osili & Xie (2009) found no significant differences in giving patterns between second-generation Americans, and third generation or higher.

This section investigates whether the giving patterns of immigration that was found in the previous sections lasts beyond the first-generation immigrants. As the previous section showed, immigrants' charitable contributions converge to those of native-born Israelis. It is therefore interesting to also test for even longer-term effects, namely, are the children of immigrants (second-generation immigrants) similar to second-generation native Israelis or to immigrants? Second-generation immigrant is determined by the father's place of birth abroad for individuals who were born in Israel. This group consists of 78,855 individuals and households, about 52% of the total sample. In Israel, virtually all immigrants are Jews, and are thus culturally and religiously more similar to the majority of native Israelis than immigrants to other countries. Ethnic origin is an important and sensitive subject in the Jewish world in general and specifically in Israel. Tensions and conflicts among the Jewish ethnic groups have shaped the way Israeli society has developed

since its early days as a state. The founding fathers of the State of Israel were Jewish immigrants who arrived from Eastern Europe at the beginning of the 20th century. For several decades, Jews of European and American descent comprised the majority of the Israeli political, intellectual and economic elite. Though inequality between the ethnic groups has narrowed in certain areas, it nonetheless continues to be prevalent today (Dahan, 2013).

The results presented in Table 6 show that while giving patterns of second-generation immigrants from America and Western Europe are not statistically different from those of second-generation native-born Israelis, children of immigrants from Africa, Asia and Eastern Europe are found to be less generous than their second-generation Israeli counterparts. These results might be interpreted as an indication for a successful assimilation of those who immigrated from wealthier countries, while the ethnic gap between native-born Israelis and immigrants from poorer countries indeed lingers and extends beyond the first generation.

6.6. Consistency

The longitudinal nature of the data also allows us to evaluate philanthropic behavior consistency. While some individuals may donate only one or a few times throughout their lifetime, others donate consistently throughout the years. For this purpose, a new variable was constructed to indicate the number of years contributions were made by a donor during the sample period (ranges between 1 and 9, equivalent to the number of years in the sample).

Only 3.8% of the donors in the data (5,820 households) contributed in all nine years of the sample period, while about 35% contributed only once during the sample period. The mean number of years contributions were made is 3.10.¹³ Preliminary analyses of the data show that donors' giving indicators (mean contribution, median contribution and contribution as share of income) increase as consistency increases. Individuals who contributed in each year during the sample period have the highest giving indicators.

To better understand the consistency patterns while controlling for other observable characteristics, donor consistency was analyzed using Poisson and negative binomial models where the dependent variable is our measure of consistency, described above. The

results are presented in Table 7 and show that donors originating from America and Western Europe are the most consistent donors, contributing an additional 0.429 and 0.445 years (respectively) more than Israeli born donors (the reference group), which amounts to an additional 13.83% and 14.35% over the sample mean. Donors from Africa & Asia and Eastern Europe are found to be the least consistent donors. These results shed new light on our previous results and provide further support of the directed appeal of the Israeli nonprofit sector towards American and Western European Jews. Not only are the amounts and share of resources they donate the highest, they are also more likely to donate year after year.

6.7. Comparison with the general population

Until now, this study focused on households and individuals who claimed tax-deductions on their charitable contributions to qualified organizations. This allowed us to test for differences between donors with respect to immigration. Unfortunately, since the data includes donors exclusively, it cannot be directly utilized to test for differences in the likelihood to donate. However, such an analysis is possible by merging the donor data with Israeli representative data from the same time period. For this purpose, the donors' data was merged with the General Expenditure Survey (GES) in Israel, conducted annually (since 2004) by the Israeli Central Bureau of Statistics. The GES is a representative sample of 6,000 households in Israel that records several socio-demographic and economic variables for each household. Though the GES is highly detailed, due to privacy concerns it is not as detailed as the donors' data. Modifications to the donors' data were implemented in order to make the two datasets comparable.¹⁴

Table 8 reports the analysis results of both Probit and Logit regression models of the merged data. In these models, the dependent variable equals 1 if individual is a donor who made a formal contribution in that year (obtained from the original tax authority dataset) and 0 otherwise (obtained from the GES survey dataset). This presents a classic case of choice-based sampling. In order to yield consistent estimates, each group is weighted by the ratio of the estimated relative frequencies of the subject groups in the population to their relative frequencies in the sample (Manski & Lerman, 1977). The weight for donors is 0.961 and the weight for GES participants is 0.039.¹⁵

The results show that individuals originating from America and Europe are more likely to be donors than native-born individuals and immigrants originating from Africa and Asia, who are the least likely to be donors. As mentioned before, the culture of formal charitable giving is highly embedded in the United States and Western countries, thus supporting the hypothesis that immigrants bring to the host country their own culture and patterns of giving from their country of origin. This indicates that American and European immigrants are over-represented among donors. Additionally, the longer an immigrant resides in Israel, the likelihood of her or him being a donor increases. This may be due to the immigrants' sense of integration within Israeli society increasing over time.

7. Conclusions

This study explored the relationship between immigration and philanthropy using a panel dataset of Israeli philanthropists who filed annual tax returns between 1999-2011. Significant differences in philanthropic behavior were found between immigrant donors and native-born donors, between immigrants from different countries, between recent immigrant and veteran immigrant donors, as well as between immigrant philanthropists and the general population. Recent immigrant philanthropists in Israel contribute significantly higher amounts than their native-born counterparts and veteran immigrants. These unique results could be related to the relatively high share of highly skilled immigrant donors originating from wealthy countries, mainly from the United States. However, with each year residing in Israel, assimilating and integrating into its society, their giving patterns decrease, converging to the level of native-born donors. American-born individuals contribute the highest amounts and are found to be the most generous and consistent donors, followed by those from Western Europe, while donors from Africa and Asia donated the least amounts and are found to be less generous and least likely to be donors. The probability of being a donor in the general population is highest among American born individuals.

Age at immigration was found to be positively correlated to charitable giving, as the scope of giving and generosity increase as the age at immigration increases, thus, supporting the hypothesis that age at arrival in the host country is a dominant factor determining the outcome of immigrant adaptation. The study's results provide a further

indication for successful assimilation of immigrants from wealthy Western countries versus those who immigrated from poorer countries. Giving patterns of second-generation immigrants originating from America and Western Europe are found to be not statistically different from those of second-generation native-born Israelis, while children of immigrants from Africa, Asia and Eastern Europe are found to be less generous than their second-generation counterparts. Finally, comparing the donors' data with the general population data shows that individuals who were born in America and Europe are more likely to be donors than native-born Israelis and those originating from Africa and Asia. These variations and differences in philanthropic behavior could be the reflection of certain sociological phenomena embedded in Israeli society. These include inequality between various ethnic groups, cultural gaps between the immigrant and the native-born populations, and different attitudes toward philanthropy by those who were born outside Israel and recently immigrated, bringing with them a different tradition and culture of giving, and possibly using philanthropy to better integrate and assimilate in their new home.

Notes

1. The Knesset Research and Information Center: Methods of Immigrant Absorption in Israel (2011)
2. ICBS (Israel Central Bureau of Statistics) - Statistical Abstract of Israel 2012.
3. Since our data do not include details about households' wealth, we used the ratio of annual household contribution as a percentage of the yearly reported income as a proxy for generosity, similar to Auten & Rudney (1990).
4. "Qualified" non-profit organizations are 'public institutions' pursuant to section 46 of the Israeli Income Tax Ordinance. Such recognition affords a tax credit to donors for their donations granted to that organization.
5. Three outliers (27 observations) were excluded from the data, representing two households who reported an exceptional contribution amount in a single year, and a single individual whose reported income was nearly 1 billion NIS. These contributions were exceptional compared to other amounts donated by these households in all other years, and compared to other philanthropists. All results remain qualitatively similar when these three outliers are included in the analyses.
6. The youngest individual in the dataset is 7 years old. Children younger than 18 do not submit tax returns. However, since the data consists of a full and complete panel, it includes young donors who claimed tax credits in the later waves of the panel.
7. Figures in this section do not control for country of origin or additional covariates that could potentially affect generosity and the tendency to contribute as a function of the duration of residency in Israel. In the next section, we present multivariate analyses that control for all of these factors.
8. For robustness sake a contemporaneous model was estimated as well. Results were quantitatively similar to the ones reported in the current model.
9. Summary statistic is not presented and is available upon request.
10. https://www.cbs.gov.il/he/publications/doclib/2018/4.%20shnatonimmigration/st04_04.pdf
11. Unfortunately, the data does not include information about wealth.
12. Immigrants who became citizens of Israel from January 1, 2007 and onwards are exempt from reporting their foreign-source income in Israel for 10 years (<https://taxes.gov.il/About/Reforms/>). In many cases this income is taxable in the country of origin. Therefore, deductible charity donations in those countries could be an alternative to donating in Israel.
13. Summary statistics of consistency is not presented but available upon request from the author.
14. The GES records localities only for large cities with a population of over 50,000, while smaller localities are grouped and recorded categorized at the sub-district level ("Nafa"); Continent of birth in the GES is divided into only 4 categories: Africa and Asia; America and Europe; Israel; and, Unknown; The number of children in the Household Expenditure Survey includes only those who live with the head of household.
15. Donors' weight is calculated as the share of donors in the sample – 1,053,827/1,096,827. Before weighting, each donor's probability weight is 1, as there is 100% probability of being sampled, while the GES participant's weights as calculated by the ICBS range from 10 to 2,305.

Figure 1

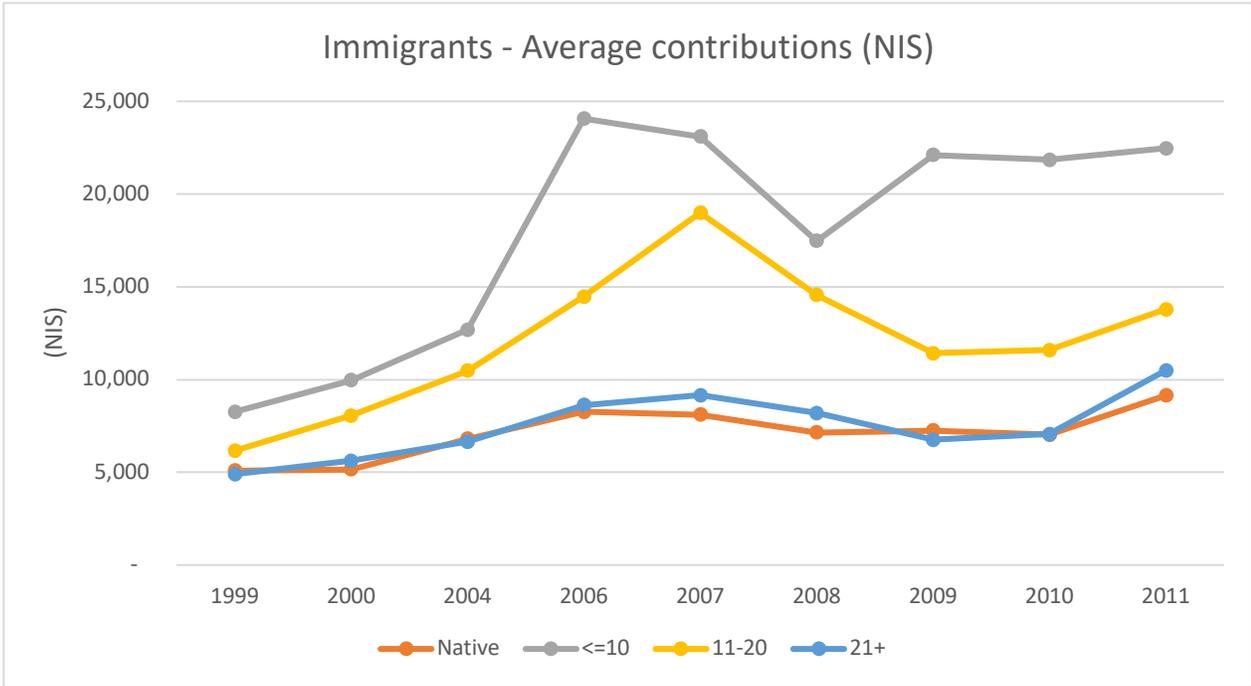


Figure 2

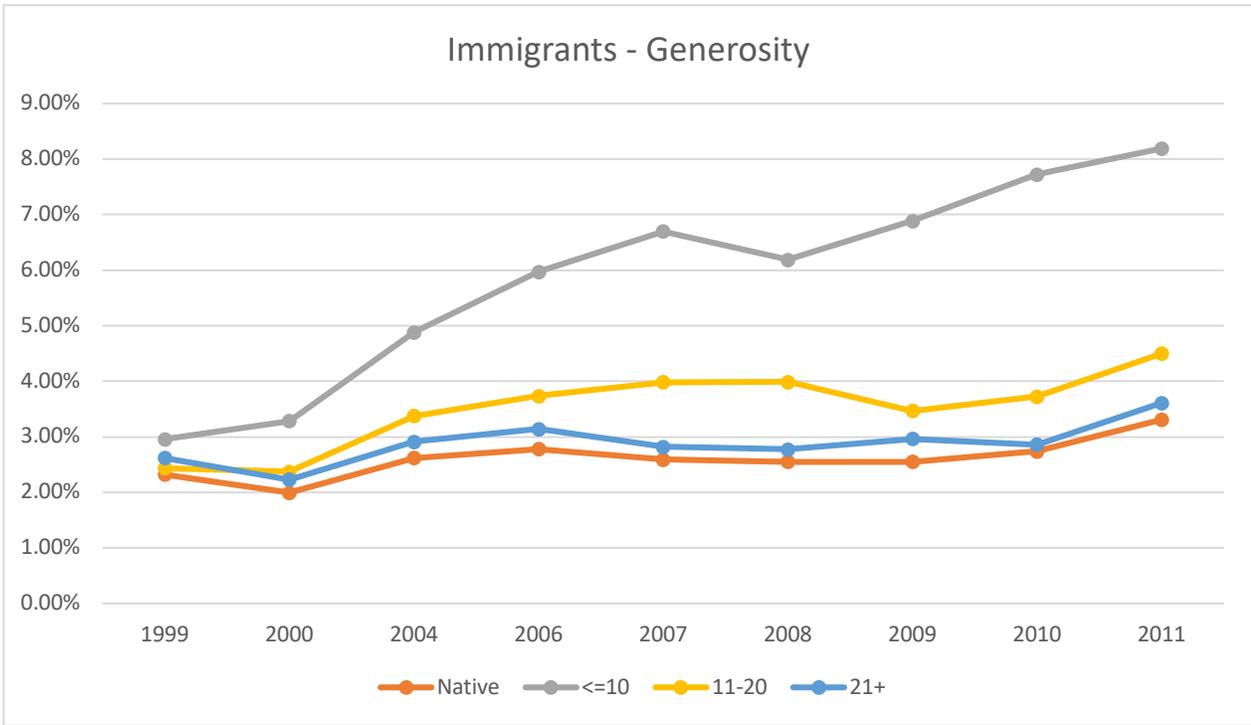


Figure 3

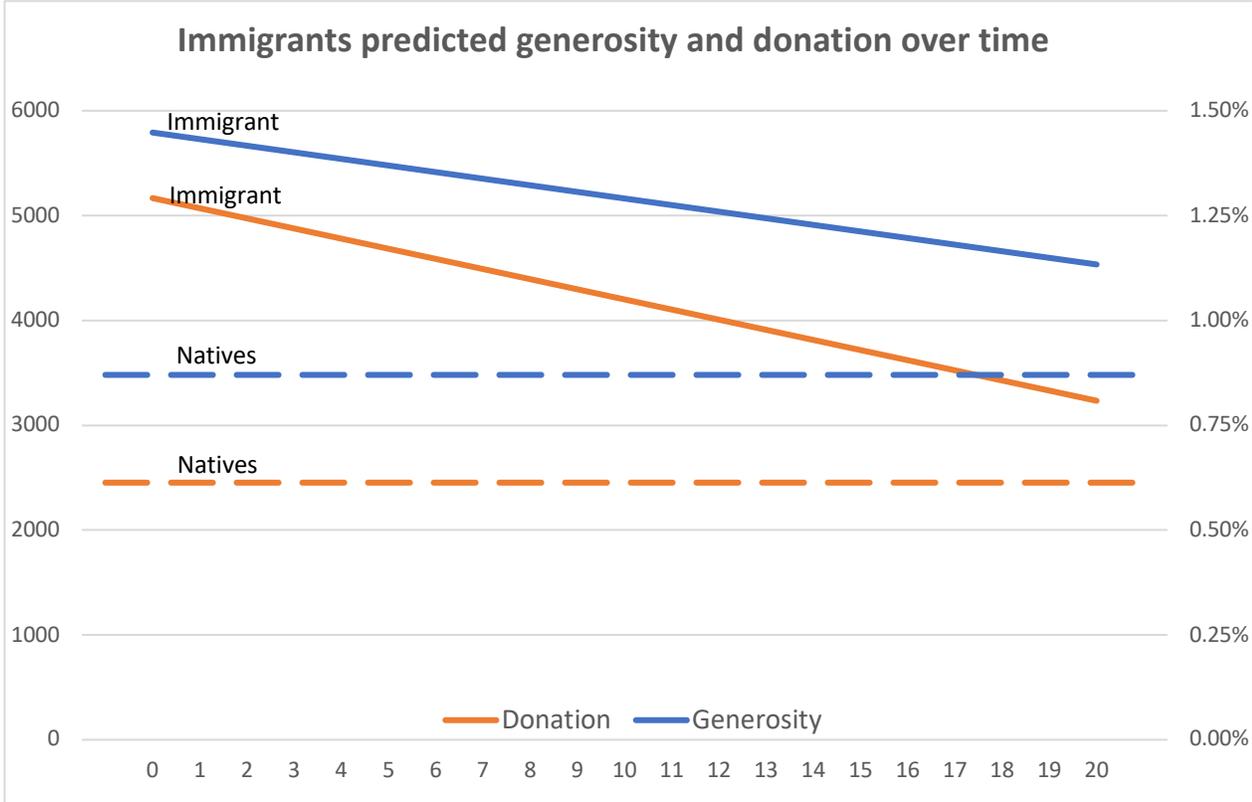


Table 1. Philanthropy summary statistics (panel)

	Mean	SD	Min	Max	p50
Donation	2,776	60,611	0	21,291,724	0
Income	307,876	555,294	-33,521	157,544,672	211,245
Age*	48.61	14.57	7	106	49
# Children	2.89	2.01	0	21	3
Immigrants	33.94%				
Place of Birth:					
Africa + Asia	11.17%				
Americas + Oceania	5.86%				
West Europe	5.42%				
East Europe	11.49%				
Married	81.68%				
Income source (earned income=1)	93.48%				
Gender (Male=1)	80.90%				
Minorities (Jewish=1)	98.97%				
N = 1,359,224					

Notes: Table 1 reports summary statistics for a panel dataset of 152,728 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 donors' 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.

Table 2. Philanthropy trends summary statistics

Year	Native Born				Immigrants			
	# Itemizers	Average donation	Donations to income ratio	Total donations	# Itemizers	Average donation	Donations to income ratio	Total donations
1999	16,827	5,135	0.32%	86,414,100	12,592	5,318	0.45%	66,967,103
2000	19,626	5,161	0.31%	101,295,196	13,906	6,317	0.50%	87,845,684
2004	25,468	6,739	0.60%	171,623,783	16,647	7,679	0.89%	127,837,562
2006	31,120	8,247	0.79%	256,643,430	18,483	10,455	1.28%	193,234,782
2007	37,695	8,060	0.89%	303,813,183	22,125	11,283	1.60%	249,640,528
2008	38,686	7,176	0.82%	277,629,196	21,819	9,451	1.36%	206,210,801
2009	42,678	7,263	0.95%	309,983,324	22,972	8,069	1.31%	185,365,376
2010	47,955	6,978	1.07%	334,616,146	24,501	8,457	1.52%	207,215,488
2011	40,882	9,136	1.19%	373,500,258	20,154	11,575	1.73%	233,278,025

Notes: Table 2 reports summary statistics for a panel dataset of 152,729 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).

Table 3. Panel OLS (main models)

	(1)	(2)
Dependent variable:	Donation (t+1)	Donation/Income Ratio % (t+1)
Immigrant	781.8*** (280.1)	0.206*** (0.0266)
Income	4.074*** (1.453)	-0.000342*** (0.0000367)
Income ²	-0.0000268** (0.0000104)	2.88e-09*** (5.69e-10)
# Children	540.6*** (80.02)	0.159*** (0.00847)
Age	-258.8*** (72.09)	-0.0328*** (0.00498)
Age ²	2.789*** (0.753)	0.000374*** (0.0000531)
Gender (male=1)	443.6** (217.5)	-0.133*** (0.0270)
Married	-190.6 (250.6)	0.0623** (0.0295)
Minorities (Jewish=1)	1633.6*** (261.5)	0.466*** (0.0730)
Constant	-1885.0 (1238.3)	-0.0717 (0.198)
Industrial classification and Income source FE	Yes	Yes
Time FE	Yes	Yes
Locality FE	Yes	Yes
N	900431	886452
R ² Overall	0.00465	0.0163

Notes: Standard errors clustered at the individual level in parentheses.

*p<0.1 **p<0.05 ***p<0.01

Table 4. Panel OLS (main models) place of birth

	(1)	(2)
Dependent variable:	Donation (t+1)	Donation/Income Ratio % (t+1)
Place of birth:		
Americas + Oceania	5290.0*** (1262.7)	0.969*** (0.0728)
West Europe	1453.3*** (391.4)	0.760*** (0.0692)
Africa + Asia	-1059.1*** (326.3)	-0.251*** (0.0340)
East Europe	-511.3 (436.3)	-0.0918*** (0.0347)
Control variables	Yes	Yes
Time FE	Yes	Yes
Locality FE	Yes	Yes
N	900431	886452
R ² Overall	0.00497	0.0182

Notes: Standard errors clustered at the individual level in parentheses.

Factor Variables reference categories: place of birth - Israel.

All models include the entire control variables presented in Table 3.

*p<0.1 **p<0.05 ***p<0.01

Table 5. The dynamic effect of residing in Israel

Dependent Variable:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Donation (t+1)				Donation/Income Ratio (0-100%) (t+1)			
Place of birth:								
Americas + Oceania	4934.1*** (1344.5)	5302.4*** (1261.4)	2703.9* (1436.8)	2721.6* (1436.3)	0.911*** (0.0777)	0.973*** (0.0726)	0.296*** (0.0856)	0.303*** (0.0854)
West Europe	1145.9*** (409.0)	2140.8*** (460.4)	-429.6 (492.1)	-417.0 (491.5)	0.711*** (0.0700)	0.920*** (0.0732)	0.280*** (0.0728)	0.285*** (0.0727)
Africa + Asia	-1169.3*** (327.6)	326.7 (512.9)	-2306.0*** (402.1)	-2297.3*** (401.7)	-0.269*** (0.0346)	0.0597 (0.0466)	-0.576*** (0.0437)	-0.573*** (0.0436)
East Europe	-676.2* (408.8)	531.2 (591.6)	-2157.2*** (453.2)	-2145.5*** (452.8)	-0.119*** (0.0363)	0.140*** (0.0377)	-0.523*** (0.0547)	-0.519*** (0.0546)
Experience:								
# of years in Israel - up to 20 years	-96.65** (46.54)				-0.0157*** (0.00521)			
# of years in Israel - Weighted (Israelis 0.5)		-93.08*** (24.23)				-0.0209*** (0.00219)		
# of years in Israel			-109.6*** (24.11)				-0.0286*** (0.00253)	
Age at immigration				108.8*** (24.05)				0.0283*** (0.00252)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	900431	900431	900431	900431	886452	886452	886452	886452
R ² Overall	0.00503	0.00507	0.00510	0.00510	0.0184	0.0189	0.0191	0.0191

Notes: Standard errors clustered at the individual level in parentheses.

Factor Variables reference categories: place of birth - Israel.

The models include all control variables presented in Table 3.

*p<0.1 **p<0.05 ***p<0.01

Table 6. First and second-generation migrants to Israel and charitable giving

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Place of origin:	Americas + Oceania		Western Europe		Eastern Europe		Africa + Asia	
Dependent variable:	Donation (t+1)	Donation/Income Ratio % (t+1)	Donation (t+1)	Donation/Income Ratio % (t+1)	Donation (t+1)	Donation/Income Ratio % (t+1)	Donation (t+1)	Donation/Income Ratio % (t+1)
Origin:								
1st generation migrant (Individual born abroad)	3441.8*** (796.5)	0.798*** (0.0812)	1087.3* (573.2)	0.673*** (0.0802)	-514.8 (624.0)	-0.273*** (0.0447)	-967.7** (443.7)	-0.0462 (0.0513)
2nd generation migrant (Father born abroad)	124.7 (267.3)	0.133 (0.0939)	220.4 (450.7)	0.0411 (0.0601)	-9.398 (407.8)	-0.138*** (0.0381)	-969.9*** (217.6)	-0.320*** (0.0294)
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Locality FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	193064	190988	205264	202277	334453	330134	399479	394765
R ² Overall	0.0111	0.0272	0.0101	0.0247	0.00507	0.0208	0.00566	0.0144

Notes: Standard errors clustered at the individual level in parentheses.

Factor Variables reference categories: Origin - 2nd generation Israeli (both father and individual born in Israel).

The models include all control variables presented in Table 3.

*p<0.1 **p<0.05 ***p<0.01

Table 7. Count models

	(1)	(2)	(3)	(4)
Dependent variable:	# Donations			
Model:	Poisson		Negative Binomial	
Place of birth:				
Americas + Oceania	0.130*** (0.00736)	0.429*** (0.0255)	0.128*** (0.00742)	0.422*** (0.0257)
West Europe	0.135*** (0.00767)	0.445*** (0.0267)	0.134*** (0.00773)	0.443*** (0.0269)
Africa + Asia	-0.0633*** (0.00642)	-0.189*** (0.0188)	-0.0594*** (0.00630)	-0.178*** (0.0185)
East Europe	-0.0189*** (0.00628)	-0.0576*** (0.0190)	-0.0183*** (0.00614)	-0.0559*** (0.0186)
Control variables	Yes		Yes	
Exposure Year	Yes		Yes	
Locality FE	Yes		Yes	
N	152710		152710	
Pseudo R ²	0.0526		0.0324	
Log Likelihood	-317699.9		-312180.7	

Notes: Standard errors clustered at the individual level in parentheses; AMEs and their standard errors in the second column for each model.

Factor Variables reference categories: place of birth - Israel.

The models include all control variables presented in Table 3

*p<0.1 **p<0.05 ***p<0.01

Table 8. Likelihood of being a donor

	(1)		(2)	
Dependent Variable: Pr(Donor)				
Model	Probit		Logit	
Place of birth:				
Americas + Europe	0.0364***	0.0101***	0.0652***	0.0107***
	(0.00458)	(0.00128)	(0.00773)	(0.00128)
Africa + Asia	-0.134***	-0.0354***	-0.223***	-0.0347***
	(0.00540)	(0.00139)	(0.00920)	(0.00139)
# of years in Israel - up to 20 years	0.0145***	0.00398***	0.0244***	0.00394***
	(0.000744)	(0.000204)	(0.00135)	(0.000217)
Control Variables	Yes		Yes	
Year FE	Yes		Yes	
Locality and Nafa FE	Yes		Yes	
Observations	1031047		1031047	
Pseudo R ²	0.140		0.138	
log likelihood	-725494.2		-725494.2	

Notes: Robust standard errors in parentheses, AMEs in the second column of each model.

The weight for donors is 0.961 and the weight for GES participants is 0.039

Factor Variables reference categories: place of birth - Israel.

*p<0.1 **p<0.05 ***p<0.01

Discussion and Conclusions

Terrorist attacks, mass shootings natural disasters and immigration represent different variations of extreme stressor events. Theory suggests that the differing mechanisms associated with each type of event could potentially generate a range of contradicting behavioral responses in the aftermath of these events. Observed variations across time and space allowed us to study, identify and quantify different behavioral response patterns associated with each different type of event.

Regarding natural disasters and mass shootings, the research has identified the importance of geographic proximity of the overall effects of these events. We observe a decline in philanthropic behavior within the communities where the shootings occur and the natural disasters strike, yet the overall behavioral response of the surrounding communities result in an increase in prosocial behavior. Furthermore, we find some evidence for spatial spillover of criminal activity from the affected county to the surrounding counties in the case of natural disasters, resulting in a local decrease of antisocial behavior, supporting previous studies' findings that looting following natural disasters is uncommon. No significant effect was found in the case of mass shootings on antisocial behavior.

These findings lend support to theories which suggest that when one's resources are at jeopardy, as in the event of natural disasters, she or he will strive to protect and conserve these resources as suggested by the Conservation of Resources model (Hobfoll, 1989), in particular financial resources, which translates to a decrease in prosocial behavior. However, when one's resources are not directly threatened, feelings of empathy and solidarity with the victims prevail, which translate into an increase in prosocial behavior as predicted by the Social Support Model (Barrera, 1998; Kaniasty, 2012).

Unlike natural disasters, mass shootings are human-made acts that are not typically characterized by domestic economic crises, as is usually the case following natural disasters. In the case of mass shootings, our results could be elucidated by the blame theory which suggests that in the affected communities, victim blaming tends to overcome prosocial behavior, and accordingly diminishes empathy towards the victims (Alicke, 2008; Appelbaum, 2002; Furnham, 1995; Shaver, 1985; Darley and Latne, 1968; Lerner and

Simmons, 1966; Heider, 1958), which translates to a decrease in charitable giving within the victimized communities.

Terrorism is another type of human-made traumatic event. Terrorists tend to choose “quality” targets of symbolic importance (Berrebi and Lakdawalla 2007), and aim to generate fear among the entire targeted population. Unlike mass shootings, terror attacks are perceived as a nationwide threat. The salience of mortality (Greenberg et al., 1986; Becker, 1971) together with a feeling of national unity and heightened patriotism lead to increased prosocial behavior in the form of higher charitable giving and an increase in the number of individuals engaging in philanthropic activity.

Lastly, the study results show that recent immigrants to Israel, mainly those who were born in the U.S. and other wealthy Western countries, were found to be significantly more generous than their native-born and veteran immigrant counterparts, but as time goes by residing in Israel, their giving patterns decrease converging to the level of the native-born donors.

The evidence presented suggest that immigrant donors to Israel possibly bring with them their own tradition and culture of charitable giving from their country of origin. Using their philanthropic activity as an entry ticket, they can develop social networks with other local elite groups, which in turn might aid their assimilation process in the host country. Furthermore, examining giving patterns among second-generation immigrants offers a new outlook to gauge inequality between ethnic groups in Israel. In accordance with other widely known inequality measures such as income and educational attainment, using charitable giving as a proxy for status, class, and socio-economic standing shows that inequality between diverse ethnic groups continues to be prevalent today.

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Chapter 1

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Contents

Chapter 1- Individual and Community Behavioral Responses to Natural Disasters

9.	Introduction	5
10.	Theory and Conceptual Framework	7
11.	Related Literature	9
12.	Data	11
13.	Empirical Strategy	12
14.	Empirical Results	14
15.	Conclusions	24
16.	Tables	27

Chapter 2 - Terror and Philanthropy

9.	Introduction	41
10.	Background and Theoretical Framework	44
11.	Data	46
12.	Methodology	49
13.	Empirical Results	53
14.	Conclusions	61
15.	Tables	63
16.	Appendix	71

Chapter 3 - Crime and Philanthropy: Antisocial and Prosocial Responses to Mass Shootings

9.	Introduction	87
10.	Theory and Conceptual Framework	89
11.	Data and Empirical framework	93
12.	Empirical Strategy	94
13.	Empirical Results	96
14.	Robustness and Falsifications	107
15.	Conclusions and Discussion	107
16.	Tables	111

Chapter 4 - Immigration, assimilation and philanthropy: A longitudinal study

9.	Introduction	125
10.	Theory and Conceptual Framework	126
11.	Related Literature	128
12.	Data	129
13.	Methodology	131
14.	Empirical Results	133
15.	Conclusions	140
16.	Figures and Tables	143

Discussion and Conclusions	153
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References	157
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A Letter of Contribution

This thesis is the product of independent research conducted by Hanan Yonah.

All chapters were written by Hanan Yonah, who is the main author of chapters 1-3, and the sole author of chapter 4. His contribution includes research planning and conception, theoretical background, literature review, collection of data, methodology implementation, econometric analyses, interpretation of the research and writing.

Professor Claude Berrebi coauthored chapters 1-3. He contributed to the formulation of the research questions and agenda, advised on the methodology design and its implementation, as well as the interpretation of the empirical results, and critically supervised the research and the manuscript.

Mr. Ariel Karlinsky coauthored chapter 3. His main contribution was collecting the data and performing computer data programming (Stata). He also provided valuable comments which improved the empirical analyses of the research.

הינו סוג פשיעה ייחודי ומובחן לעומת כל סוגי הפשיעה האחרים (כולל פשעי אלימות אחרים), מבחינת השפעתו על התנהגות פרו ואנטי-חברתית.

הפרק האחרון עוסק ביחס שבין הגירה ואסימילציה, ובין התנהגות פילנתרופית. הטרוגניות החברה הישראלית ומאפייניה הייחודיים כחברה קולטת הגירה הן מארצות רווחה והן מארצות מתפתחות, מאפשרים הזדמנות ייחודית לחקור את היחס בין הגירה ובין התנהגות פרו-חברתית. המתודולוגיה המחקרית בפרק זה מבוססת על ניתוח מאגר נתוני פאנל ייחודי של כל אוכלוסיית התורמים בישראל אשר ביקשו זיכוי מס בעבור תרומות לפחות באחת מהשנים 1999 – 2011, בדומה למסד הנתונים בפרק 2. אסטרטגיית הזיהוי מבוססת על השוואת בהיקף התרומות בין מהגרים ובין ילידי הארץ בהתחשב בתהליך האסימילציה שמהגרים חווים בארץ הקולטת לאורך השנים.

הממצאים העולים ממחקר זה מראים כי בישראל, מהגרים חדשים פילנתרופים, תורמים באופן משמעותי יותר הן מעמיתיהם ילידי הארץ, והן ביחס למהגרים ותיקים. ממצאי המחקר מציגים באור חדש את היחס בין הגירה ופילנתרופיה והינם ייחודיים ביחס למרבית הממצאים המובאים בספרות העולמית העוסקת בנושא זה. ניתן להסביר תוצאות אלו בהתגברות זרם העולים ממדינות מפותחות בעלי הון אנושי גבוה ומיומנויות אישיות גבוהות, בעיקר מארה"ב. אולם, עם כל שנת שהות נוספת בישראל מאז עלייתם, וככל שהמהגרים משתלבים ונטמעים בחברה הישראלית לאורך השנים, דפוסי תרומתם קטנים מדי שנה והם מתכנסים לרמה הממוצעת של תורמים ילידי הארץ.

התוצאות המוצגות בפרק זה מראות כי בעוד היקף התרומות הכספיות מצטמצם בקרב קהילות אשר נפגעו ישירות מאסונות טבע, הקהילות השכנות ואף המרוחקות יותר מגבירות את היקף הנתינה המדווחת. בנוסף, אנו מוצאים עדות לדחיקת תרומות כספיות כתוצאה מתמיכה ממשלתית בקהילות אשר נפגעו מהאסון. מעניין לציין כי בניגוד לדיווחים שכיחים בתקשורת וברשתות החברתיות על פשיעה וביזה בעקבות אסונות טבע, ממצאי המחקר מראים כי אסונות טבע אינם מובילים לגידול בפשיעה, ואף להפך – בעקבות אסונות טבע, שיעור הפשיעה בקהילות שנפגעו באופן ישיר יורד.

בפרק השני (נכתב במשותף עם קלוד בר-רבי) אנו משתמשים בסכסוך הישראלי-פלסטיני כמקרה בוחן כדי לחקור את הקשר הסיבתי בין טרור ובין התנהגות פילנתרופית. האסטרטגיה האמפירית בפרק זה מבוססת על מסד נתוני פאנל ייחודי של כלל אוכלוסיית התורמים בישראל אשר תרמו וביקשו זיכוי מס בלפחות באחת מהשנים 1999 – 2011 (152,731 פרטים ומשקי בית), וכן על מסד נתונים מפורט של פיגועי טרור אשר אירעו בתקופה זו בישראל, הכולל בין השאר את מיקום הפיגוע ומספר הקורבנות שגבה. טרור הינו אקסוגני לתרומות פילנתרופיות, דבר המאפשר לנו לאמוד את ההשפעה הסיבתית של פיגועי טרור על תרומות פילנתרופיות של פרטים ומשקי הבית. אנו משווים את השינוי בדפוס הנתינה של תורמים - פרטים ומשקי בית, בישובים בהם אירעו פיגועי טרור, לעומת קבוצת ביקורת של תורמים בישובים אשר לא נפגעו מפעולות הטרור, תוך פיקוח על הכנסה ומשתנים דמוגרפים נוספים. בנוסף, אנו אומדים מודל עם משתנה עזר (IV), על מנת לבסס אף יותר את הקשר הסיבתי ולמתן חשש מפני אנדוגניות.

ממצאי המחקר מראים כי בממוצע פיגועי טרור מגבירים באופן ניכר את היקף התרומות של פרטים ומשקי בית, אולם קיימת שונות מובהקת בהתנהגות פרו-חברתית זו בקרב מגזרים שונים באוכלוסייה בעלי מאפיינים שונים כגון מגדר, מיעוטים ומוצא.

הפרק השלישי (נכתב במשותף עם קלוד בר-רבי) חוקר את הקשר בין ירי המוני והתנהגות פרו ואנטי-חברתית בארה"ב. בעשור האחרון התרחשה עליה דרמטית בכמות אירועי ירי המוני בארה"ב, אשר בשונה מסוגי פשיעה אחרים כדוגמת רצח, שוד או פריצות הינם אירועים בהם מטרת המפגע היא להרוג כמה שיותר קורבנות באופן כמעט אקראי, כאשר לרוב בין הקורבנות ובין מבצע הירי לא התקיים קשר ישיר קודם. אירועים אלה זוכים לכיסוי תקשורתי נרחב ואינטנסיבי בהשוואה לאירועי מוות אחרים, דבר המעצים את האפקט שלהם באופן ניכר. על מנת לזהות ולכמת את הקשר בין ירי המוני ובין התנהגות פרו ואנטי-חברתית אנו משתמשים בנתוני תרומות, פשיעה וירי המוני בארה"ב בשנים 2004 עד 2015.

הממצאים האמפיריים במחקר זה מעלים כי סך התרומות, במדינות בהם אירע ירי המוני, גדל בעקבות אירועים אלו. אולם, בנייתו הנתונים ברמת המחוז נמצא כי במחוזות בהם אירע ירי המוני, קטן היקף התרומות באופן ניכר. הסבר אפשרי לממצאים אלו ניתן למצוא באשמה המיוחסת לקורבנות ולקהילה הפגועה. בבחינה של מגוון סוגי פשיעה שונים לא נמצא קשר בין סוגי פשיעה אחרים ובין נתינה פילנתרופית. אנו מראים כי ירי המוני

תקציר

פילנתרופיה הינה תופעה משמעותית בעלת השפעה רחבה על הכלכלה ועל מדיניות ציבורית ברחבי העולם. החשיבות החברתית של הפעילות הפילנתרופית מתועדת במאמרים רבים והיא מהווה צוהר למערכת היחסים בין הפרט ובין הקהילה, לסולידריות חברתית וקהילתית, לערכי הפרט ועוד. על אף ספרות אקדמית ענפה בנוגע למרכיבים החברתיים והכלכליים של פילנתרופיה, המחקר האקדמי על השפעתם של אירועים טראומטיים קיצוניים על התנהגות פרו-חברתית הינו נדיר.

לאורך מחזור חייו, חווה אדם אירועים שונים, חלקם מתוך בחירה וחלקם שאינם בשליטתו. עבודה זו, המכילה ארבעה פרקים, בוחנת אמפירית אספקטים שונים של התנהגות חברתית כתגובה למגוון אירועים טראומטיים: טרור, ירי המוני ואסונות טבע, המיצגים אירועים חיצוניים נקודתיים, וכן ביחס להגירה – אירוע משנה חיים הנובע מתוך בחירה עצמית והמלווה בסטרס הנמשך על פני תקופה ארוכה יחסית לאורך תהליך היטמעות המהגר בחברה הקולטת. תיאוריות שונות חוזות התנהגות חברתית שונה בתגובה לאירועים טראומטיים. מחד, בעקבות הסטרס הנלווה לאירועים אלו ישנם פרטים ומשקי בית אשר ירצו לשמר את משאביהם הפיננסים (כולל תרומות כספיות). מאידך, מתוך אמפתיה עם קורבנות, התגברות המודעות למצוקה וגורמים דומים, אחרים יגיבו דווקא בנדיבות ויגדילו את תרומותיהם. התאוריה לבדה אינה מספקת תשובה חד משמעית לשאלת העוצמה היחסית של תגובות אלו. אוסף המחקרים הכלול בעבודה זו מבקש אם כן לבחון אילו מן התגובות האפשריות דומיננטית יותר.

המחקרים המוצגים בתיזה זו מבוססים על מסדי נתוני אורך (פאנל), לאורך תקופת זמן ארוכה יחסית בהם ישנן תקופות טיפול ועוצמות טיפול שונות על פני הזמן והמרחב. מסדים אלו מאפשרים לנו לאמוד מודלים סטטיסטיים הכוללים אפקטים קבועים ברמת המרחב והזמן. גישה זו מאפשרת לנו לחקור סטטיסטית את השונות בהתנהגות פילנתרופית של פרטים ומשקי בית אשר נחשפו לאירועים טראומטיים (קבוצת הטיפול), לעומת אלו אשר לא נחשפו לאירועים אלו (קבוצת הביקורת) לאורך זמן, תוך פיקוח על משתני בקרה כלכליים, וסוציו-דמוגרפיים. שלושת הפרקים הראשונים חוקרים את השפעתם של אסונות טבע, טרור וירי המוני על התנהגות פרו-חברתית ואנטי חברתית של פרטים וקהילות באמצעות מאפייני תרומות. הפרק הרביעי בוחן את מערכת היחסים בין הגירה ואסימילציה, ובין התנהגות פילנתרופית.

הפרק הראשון (נכתב במשותף עם קלוד בר-רבי ואריאל קרלינסקי) חוקר את התגובה החברתית של פרטים וקהילות בתגובה לאסונות טבע. אסון טבע הינו שוק חיצוני, קוואזי-רנדומלי ובלתי צפוי, שהשלכותיו הפסיכולוגיות, הכלכליות והחברתיות מתועדות היטב בספרות המחקרית, אך התגובה הפילנתרופית לא נחקרה דיה, או שנחקרה באמצעות מקרי בוחן בודדים שהתוקף החיצוני שלהם מוטל בספק. באמצעות שימוש בנתונים מנהליים מפורטים של תרומות ואסונות טבע בארה"ב מהעשור האחרון, אנו מזהים ומכמתים את השפעת אסונות טבע על התנהגות פרו-חברתית ואנטי-חברתית, כפי שאלו באים לידי ביטוי בתרומות כספיות ופשיעה.

עבודה זו נעשתה בהזרכתו של פרופסור קלוד בר-רבי

אירועים משני חיים והתנהגות פרו-חברתית

טרור, ירי המוני, אסונות טבע, הגירה ופילנתרופיה

חיבור לשם קבלת תואר דוקטור לפילוסופיה

מאת חנן יונה

הוגש לסנט האוניברסיטה העברית בירושלים

דצמבר 2019