Informal Networks and White Collar Crime: An Extended Analysis of the Madoff Scandal

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ABSTRACT

Understanding the nature of white collar crime is a central issue in public policy. Testing the theories presented by Benson, Madensen and Eck (2009), I examine the role of informal religious networks in the criminal activity of Bernard Madoff, perpetrator of one of the largest white collar crimes in United States history. In contrast to previous studies that suggest that religion may reduce the incidence of criminal behavior, I show that the opposite can also be true. Most white collar crimes, like those perpetrated by Madoff, are exploitations of trust, which can be fostered by a shared religious identity between the victim and perpetrator. Using data from the National Center of Charitable Statistics, I construct two measures of Jewish religious network strength at the county level: the concentration of Jewish non-profit organizations and the revenue of Jewish non-profit organizations. Additionally, using data from the Jewish Community Center Association of North America and several U.S. Kosher certification organizations, I construct the number of Jewish community centers and the number of kosher restaurants per county. I show that conditional on the number of high income individuals in a county, residents of counties in which there were stronger Jewish networks were more likely to have been victimized by Madoff. In addition, I show that residents of areas where Madoff lived or worked were more likely to be victims, but that Jewish network strength appears to counteract this "distance effect." Non-profit organizations, which were also victims of Madoff, were less affected by the strength of this informal network.

I. INTRODUCTION

Social networks have long been considered important sources of jobs, information and assistance. Social networks form through individuals linked by a common bond, social status, geographic or cultural connection. Social networking websites like Facebook, MySpace, and LinkedIn have exploded in recent years, with companies even using these websites to research and recruit potential employees. Additionally, celebrities often suggest that to achieve fame, individuals must explore social groups and settings in order to build the necessary relationships. Many books even suggest that if you want to get anywhere in life, you need to connect with people.

Substantial research has shown that there are real benefits of social networks. Membership in social networks may provide substantial physical and mental health benefits (Maulik, Eaton & Bradshaw, 2009; Smith & Nicholas, 2008). Trusting relationships and tight knit bonds often form from members' shared common interests or characteristics (Karlan, Mobius, Rosenblat, & Szeidl, 2009). It is likely that these relationships may foster non-pecuniary benefits, such as increased friendship and companionship. However, this same sense of trust may lead network members to take greater within-network financial and business risks (Light & Rosenstein, 1995). In sociological theory, these risks have been termed "generalized exchanges," or transactions between two individuals in which one participant provides a good to the other without any immediate return, purely based on the trust they place in the other party (Bearman, 1997). One typical example is a susu, in which ethnic West Indians, Africans, Mexicans and Asians pool an amount of money with others from their ethnic-social network and rotate the recipient of a fixed amount on a monthly basis (Halter, 1995).

The existence of susus could imply that members trust each other as much or more than they trust federally regulated and insured banks where they could easily deposit their money.

However, the potential for these networks to be abused is often not considered. Social networks can also be used to promote illegal markets, such as drug (Reuter & Calkuins, 2004) and under-the-table employment markets (Venkatesh, 2006), which would ordinarily fail due to the prohibitively high costs and risks associated with their existence. Social networks have also been used to collude in the heavy electrical equipment industry (Baker & Faulkner, 1993) and to shelter fraud in companies with both legal and illegal operations (Baker & Faulkner, 2003). These markets thrive based on members' beliefs that fellow members would not hurt "their own." Excessive trust can leave members of these social networks open to theft, fraud and deceit.

White-collar crime is commonly described as an abuse of trust (Schover, 1998). Unlike victims of street crime, many victims of white-collar crime do not know that they are victims until after the crime has occurred, if even then. As Levi (2009) highlights, white collar crime is typically committed by known individuals, whereas the public typically thinks of criminals as strangers. Thus, individuals may be at a particularly high risk for white collar crime victimization as they are not as skeptical of the offender. The elimination of the "necessary link of geographic propinquity between victim and offender" means that the criminal could be across the country or in one's own neighborhood (Levi, 2009). Though white-collar crime is commonly associated with the banking industry, white-collar crime has pervaded a variety of industries, including auto repair (Schneider, 2009), real estate (Levitt & Syverson, 2008), newspaper sales

(Pruckner & Sausgruber, 2008), food sales (Levitt, 2006) and sumo wrestling (Duggan & Levitt, 2002). The costs of these crimes often cannot be calculated because of the "invisible" nature of white-collar crime and the difficulty in compiling data on discovered offenses. However, in the wake of Tyco, Enron and now the Madoff scandal, the public outcry suggests that people are heavily affected by these offenses.

White collar crime poses a particular issue for government policy because a deterrent white-collar crime cannot be effectively developed without being able to measure the causes and effects of white-collar crime. Survey data has consistently shown for over two decades that the public views white collar crime almost as serious an offense as traditional street crime (Evans et al. 1993; Levi, 1987). The social harm caused by white-collar crime may be far more damaging than the social harm caused by street crime. White collar crime can erode the public's trust in institutions and increases transaction costs as people become increasingly suspicious of others and require excessive amounts of information for economic transactions (Levi, 2009; Shleifer & Vishny, 1993). In fact, as Levi (2009) highlights, the increases in transaction costs can be so large that they merit heavy consideration in the cost-benefit analysis of crime control policies. Moreover, unlike street crime, where victims typically know ways to protect themselves either privately (e.g. installing a home security system) or publicly (e.g. voting for officials who want to increase police presence), little is known about methods of protection from white-collar crime.

To contribute to this newly emergent field, I attempt to disentangle the effect of religious network strength on white-collar crime victimization. Unlike other research which exploits variation in the regulatory environment to identify the incidence of

victimization (Duggan and Levitt, 2002; DellaVigna & Ferrara, 2007) or creates experimental situations that artificially manipulate victimization (Pruckner & Sausgruber, 2008; Schneider, 2009), my research uses the universe of known victims in the Bernard Madoff Ponzi Scheme. This difference in datasets and measurement allows me to measure the average white-collar crime (opposed to the marginal crime). As I will later discuss, this difference will allow for more precise victimization measurement and resultant crime policy. This study will explore the allegation that Bernard Madoff used his membership in the Jewish American enclave to defraud investors and will examine the extent to which social networks facilitate white-collar crime and.

The paper proceeds as follows. I begin with a short description of the Madoff scandal in section II. I then describe the history of social networking theory, why Jewish-Americans can be considered a social network, the role that informal networks can play in investment behavior, and how individuals in those networks can be at increased risk of white collar crime victimization. In section IV, I describe the data that I use to measure white collar crime and informal religious network strength, and in section V present my analytic strategy for identifying the relationship between these variables. Next, I discuss my empirical results in section VI and finally conclude in section VII.

II. THE MADOFF SCANDAL

Bernard Madoff founded Bernard L. Madoff Investment Securities LLC (hereafter Madoff LLC) in 1960. Although initially investors' returns were ordinary relative to the market, between the mid 1980s and early 1990s, returns began to sky rocket. Madoff became known for double-digit returns on investments (typically around 12-15%). His guarantee of high returns attracted high-wealth individuals and organizations alike from across the country including major non-profits, unions and multimillionaires. However, unbeknownst to investors, these high returns were actually assets of subsequent investors. The investors were victims of the largest Ponzi Scheme in US history.

Even without the benefit of hindsight, choosing to invest in Madoff was a high-risk choice. Madoff was exempt from certain SEC regulation. News reports and the SEC itself have suggested that Madoff played a prominent role in creating an exemption, which permitted him to temporarily sell stock that he did not own as long as the purpose was to "maintain liquidity" (Wutkowski, 2008). Additionally, Madoff used many "feeder funds," which allowed him to officially report far fewer individual investors than existed (Chew, 2009). Therefore, Madoff faced far less daily scrutiny than did the average investment firm (Krug, 2008).

Additionally, the SEC's Inspector General found that between 1992 and 2008, the SEC ignored six substantive complaints against Madoff (Stout, 2009). For example, in May 2000 Harry Markopolos, a Massachusetts-based financial analyst, sent a letter to the SEC urging an investigation of Madoff LLC, which he believed was a Ponzi scheme.[1]

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[1] The media suggests Madoff may have been able to escape SEC investigation in spite of Markopolos' allegations because Madoff had built a tight, trusted social network with SEC employees (Zuckerman & Scannell, 2008). It should be noted that a recent report issued by the SEC Inspector General found no

Nonetheless, the SEC failed to take any action. Despite such evasion, on December 11, 2008, Madoff confessed that he had been running a Ponzi scheme. In subsequent months, Madoff plead guilty to 11 counts of filing false reports with the SEC; theft; and securities, wire, and mail fraud. Ultimately, Madoff paid an undisclosed fine to the SEC, was banned from working in the financial sector and received a 150-year term prison sentence.

Besides taking money from many of the socially elite, it has been widely suggested that Madoff preyed in particular on fellow members of his Jewish-American social network (Fox News, 2009). Reports often cite his wife's Kosher cookbook (Cowan, 2009), his purported strict adherence to Jewish practices (Cowan, 2009), and his involvement in Jewish organizations like Yeshiva University (Chiber, 2009) as examples of how Madoff built trust within the Jewish-American network.[2] As a result of the Madoff scheme, some researchers have even called for charitable foundations to alter the size and structure of their operations in order to decrease their reliance on "personal ties" (Jagpal & Craig, 2009).

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substantial relationship between Madoff and SEC Chairman Mary Schapiro, who formerly headed the Financial Industry Regulatory Authority (Associated Press, 2009).
[2] Although unverified, rumors have spread that Madoff had an affinity for pork sausage, which suggests he may have not been as religious as he suggested, since this would clearly violate the same laws of Kashrut that he and his wife swore they upheld.

III. LITERATURE REVIEW

A. The History of Social Networks Research

Social networks are associations of people drawn together by family, work, hobbies, ethnicity or other defining characteristics. Early social network research is traced to Compte's examination of static (social interconnections) relationships in the mid-nineteenth century (Freeman, 2004). Durkheim also pioneered the field with his 1897 cornerstone work, *Suicide: A Study in Sociology*, In his theory of norms of social control, Durkheim asserted that religious groups exert an informal control over their constituents. This sense of control and belonging to a community, Durkheim argued led to regulation in excessive aspects of one's life. Without such control, individuals would feel anomie (i.e., alienation and a lack of purpose). This theory suggests that religious social networks may have positive social effects by reducing excessive behavior, which would in turn promote rational actions.

Building on Durkheim's fundamentals, later social theorists continued to extend social network theory research. Tönnies (1935) characterized social groups using his theories of Gemeinschaft and Gesellschaft. Gemeinschaft, as defined by Tönnies, explains bonding between friends and families; he argues that these relationships are based upon emotional bonding and unity. On the other hand, Gesellschaft promoted the continuation of impersonal social relationships based on individuals needs to fulfill certain fundamental monetary needs (Tönnies, 1935). Barnes' (1954) seminal piece on social relationships in a small Norwegian village explicitly defined social networks for the first time as "an association of people drawn together by family, work or hobby." This term was later expanded by a series of researchers to include all social categories

(e.g. race, gender, ethnicity) and fixed-relationship categories (e.g. family and tribes) (Berkowitz, 1982).

Although there are many metrics for social network strength, one defining feature of social networks is the strength of the tie. Two common distinctions are strong ties and weak ties. Strong ties, as defined by Sir Hebert Spencer and Chalres Horten Cooley in the early twentieth century are connections mainly characterized by primary relationships (Freeman, 2004; Granovetter, 1973). Primary relationships are often warmer, closer relationships such as friends, family and lovers (Gordon, 1964). These strong ties may lead to more trusting bonds (Coleman, 1988). Weak ties, in contrast, are associated with, among other things, secondary relationships, lower frequencies of contact, lower duration of the tie, less emotional closeness (Granovetter, 1973). Gordon (1964) identifies these bonds as looser links, often constructed through employment, civic engagement (e.g. social clubs) and political activism. Granovetter (1973) suggested that weak ties allowed individuals who barely knew each other to associate through sharing a common belief or characteristic. Moreover, he suggested that strong ties could not develop without preexisting weak ties.

Centrality, the measurement of individuals' position in a social network, is also important in measuring social networks. Centrality can be measured in terms of the number of connections an individual has (degree centrality), the number of individuals between two unconnected individuals (betweeness centrality), and the social distance between individuals in a network (closeness centrality) (Hanneman & Riddle, 2005). Research has associated increased centrality with increased power and influence in a social network (Brass, 1984; Friedkin, 1993). Additionally, Burt (1992) argues that being

at the center of many disconnected people is critical to holding group power. By being in contact with many otherwise disorganized people, this coordinating person can more easily manipulate the group and prevent others within the group from colluding against you. Such power may even provide the coordinating individual the exclusive power to direct the flow of resources between individuals (Burt, 1992).

B. The Formation of the American Jewish Social Network

The existence of Judaism as an ethnicity demonstrates the existence of a Jewish American social network. Ethnicity is a socially defined concept based on cultural characteristics: language, religion, history, appearance, ancestry and/or region (Nagel, 1994). Under this definition, Jewish Americans are an ethnic group: they share a common religion, religious language and history composed of stories of events, a homeland and oppression. Moreover, many Jewish Americans' share a common heritage as many of their ancestors immigrated from Central and Eastern Europe (Diner, 2004). Additionally, there are many population clusters of Jewish Americans in particular cities throughout the United States, such as New York City, Miami and Los Angeles (American Jewish Committee, 2007). As defined by Berkowitz (1982), the existence of such a clear ethnic community would prove the existence of a Jewish American social network.

Historical and continued persecution of American Jews has strengthened the Jewish American culture. Discrimination against Jews is widely traced back to the seventeenth century. During the early 1900s, following a sizeable increase in the Jewish-American community, large groups of Jewish American immigrants were victims of discrimination (Tobin & Sassler, 1988). Starting in the late nineteenth century, cities began to implement restrictive zoning, which overtly banned Jews from living in certain

neighborhoods. While the Supreme Court banned these zoning restrictions, developers quickly turned to restrictive deed covenants in order to circumvent the federal ban. The Supreme Court's support of these covenants in *Corrigan v. Buckley* (1926) has been considered a serious promoter of widespread segregation in suburbia (Jones-Correa, 2000/2001). For example, in Baltimore, developers advertised developments that "safeguard owners from…uses of property detrimental to the value and general good of a residential section" (Power, 1996). While the 1926 ruling was overturned in 1948, a considerable amount of segregation already existed (Jones-Correa, 2000/2001).

To overcome this discrimination, Jews bound together as a "middleman minority." Middlemen minorities, such as American Jews, are minority groups that take an intermediate status position between consumers and producers, typically in trade and commerce markets. For example, many Jews in New York City at the turn of the twentieth century lived and worked together in trade in order to save money (Sowell, 2005) and Palestinian-Arabs are often found to be middlemen in the grocery store business in cities where they reside (Cohen & Tyree, 1994). Bonacich (1973) argues that the continued hostility from the host society (i.e., Christian America) alienates American Jews, and in turn, reinforces a sentiment of Jewish American organization and structure. This increased Jewish American structure feeds increased host hostility. Ultimately, this cycle promotes and continues Jewish American enclaves and social networks (Bonacich, 1973). This theory is also consistent with Burt's (1992) argument that the being the connector in a group holds the most power. In the case of middlemen minorities, such as Jewish Americans, they were able to connect consumers and producers while maintaining significant market power.

Although most Jewish Americans currently easily coexist with other Americans in residential, marital and occupation settings, anti-Semitism remains a source of concern in the United States. A 2007 survey found that 15% of the general population reported holding strong anti-Semitic views (Anti-Defamation League, 2007). Additionally, approximately 70% of all religious hate crimes committed in 2007 were against Jews (Gimpson, 2008). Such discrimination may encourage the formation of weak ties amongst the Jewish community by bonding over their historical and modern inequity. According to the theory of homophily, individuals of similar attributes are more likely to connect with each other (McPherson, Smith-Lovin & Cook, 2001). Mehra, Kildruff & Brass (1998) provide support for this theory in finding that individuals of racial and gender minority groups were more likely to form social bonds with similar individuals in both a work and academic context. Such network formation was highly attributed to individual preferences for friends with common backgrounds and exclusionary practices by majority group members. Bernard Madoff provides an excellent example of a minority who surrounded himself with others of a similar background. Madoff was a child of the 1940s, when private organizations like schools, country clubs and neighborhoods discriminated more heavily against Jews. Madoff was likely unable to expand his social network as a child, only furthering his propensity to build notably stronger networks with other Jewish Americans. Later, Madoff became a member of the Board of Trustees for Yeshiva University, was heavily involved in Jewish non-profit work and professed his devotion to Jewish religious circles (Chibber, 2009).

C. The Effects of Distance on Social Network Strength

Historically, social distance has been widely accepted as a feature of social networks. Social distance was first introduced in Simmel's analysis of "the stranger," in which he argues that there is an optimal distance for individuals to keep between themselves and acquaintances (Simmel, 1950). The definition has been refined and now often refers to the similarity of individuals based on demographic characteristics (Poole, 1927). Most commonly known, however, is Bogardus' Social Distance Scale, which asks questions related to willingness to participate in different social activities with other individuals such as being neighbors, marrying and working together. Scores from this scale can be summed and used to calculate how individuals perceive other groups and how willing these individuals are to interact with differing groups (Bogardus, 1926). Important characteristics of social distance include race, ethnicity, economic resources, social background and gender.

Closeness centrality, or social distance, likewise has been found to contribute to the strength of social networking. Hipp & Perrin (2009) find that as social distance between individuals in a neighborhoods increases, the likelihood of strong or weak ties forming significantly decreases. Research has also suggested that individuals minimize interaction with more distant individuals because there is a direct relationship between physical distance and costs of maintaining ties, *ceteris paribus* (Zipf, 1949). While the costs of maintaining ties may be decreasing with the growing ability of technology to connect individuals, this relationship still seems to hold, as an equivalent decrease in network ties is equal to either a 10% change in the social distance or a 5.6% increase in physical distance (Hipp & Perrin, 2009). This is consistent with the observed spatial distribution of Madoff victims. Specifically, the most physically distant counties from

Madoff's homes and office have many fewer Madoff investors, presumably due to the lack of social ties and social similarity to Madoff. Therefore, the presence of any Madoff victims in a distant area might suggest the presence of developed networks through which information and (misplaced) trust in Madoff could spread rapidly.

The homophily principle states that the flow of information between individuals is a declining function of social distance (McPherson & Ranger-Moore, 1991). Essentially, this suggests that as social distance increases (i.e., people become increasingly dissimilar), people are less likely to interact and exchange information. Homophily has been demonstrated in racial diversity of school friendships (Quillian and Campbell, 2003; Mouw and Entwisle, 2006), gender grouping in volunteer organizations (McPherson & Smith-Lovin, 1987) and interracial professional relations at work (Bacharach, Bamberger & Vashdi, 2005). Lazersfeld & Merton (1954) even distinguished homophily effects based on individual's social status (occupation or group membership) and social values, important abstract standards that dictate decision making (individualism or aggression). Social networks may provide an opportunity for offenders to interact with victims (Eck & Clarke, 2003). Ultimately, social distance between offender and victim may be a significant factor in determining likelihood of white collar victimization (Benson, Madensen & Eck, 2009).

The effect of propinquity, physical distance, on social network strength is extremely important when considering Madoff's potential abuse of a social network. Caplow and Forman (1950) showed that married couples in college dorms were more likely to befriend other couples who were more physically proximate. Similarly, Festinger, Schacter and Back (1950) demonstrated the same relationship by studying

friendships in apartment buildings. Individuals were most likely to be friends with their

neighbors and least likely to be friends with people on different floors of the building

(Festinger et al., 1950). This implies that areas with high concentrations of Jewish

Americans may have been particularly vulnerable to Madoff because word of Madoff

would have spread more quickly in these densely Jewish areas and individuals may have

been more likely to follow their peers' suggestions to invest with Madoff.

Within criminological theory, physical proximity is related to the frequency of

street crimes in both crime pattern theory and situational crime prevention theory.

According to crime pattern theory, crimes are more likely to be committed in locations

that are familiar to the offender. For example, an analysis of robberies in Chicago

illustrates that robbers were more likely to travel further to an area that was similar to

their own neighborhood rather than rob an individual that was physically closer but

demographically different (Brantingham & Brantingham, 1991). Situational crime

prevention theory, on the other hand, suggests that an increase in physical distance acts as

a deterrent to commit a crime. Empirically, physical proximity to offenders is a positive

predictor of street crime (Capone & Nichols 1976; Bernasco & Block, 2009). Again, this

trend is consistent with Madoff data as the counties with highest victim rates are

relatively close to Madoff's homes.

D. The Effects of Networks on Trust

Both strong and weak social network ties have a direct impact of trust. Several

studies have found that within businesses, weak ties and the ability to bridge networks are

incredibly important in allowing Directors and Officers to influence decisions and shape

policies in large, public companies (Burt, 2005; Coleman 1988). However, research

examining board members of private companies, similar in size to Madoff's firm, suggest that strong ties are also critical to building trusting relationships within a network (Stevenson & Radin, 2009). Moreover, Berardo (2009) examined 22 communities across the nation and has suggested that network centrality greatly improves trust within a network. He finds that groups with increased centrality have more trusting relationships. Trusting relationships may lead individuals or firms to perform repeat transactions with the same individual/firm because the trusting relationship will lower transaction costs so significantly that this option becomes the most efficient solution (Granovetter, 1985), These findings have also been generalized to community relationships and friendships (Karlan et al., 2009). Therefore, one might expect Jewish Americans to have some trust for other Jewish Americans through weak ties; the existence of strong ties within local Jewish communities would reinforce preexisting weak-tie trust. As I will discuss in further detail, this trust may have lead to less monitoring by investors, allowing Madoff to escape undetected until his collapse.

The propagation of trust through social networks has serious consequences on individuals' sources of information and outcome perspectives. The problems associated with decision-making are commonly divided into two categories: questions of uncertainty (i.e., a lack of sufficient information on how to do something) and questions of ambiguity (i.e., sufficient information but the decision is difficult) (Saint Charles & Mongeau, 2009). Saint Charles & Mongeau (2009) find that individuals dealing with questions of uncertainty often turn toward perceived experts in the field with whom they often share weak ties. However, people rely on friends and family (strong ties) for questions of ambiguity. Additionally, individuals who are only distantly connected to a subject tend

to have unrealistically positive views (Smith-Doerr, Manev & Rizova, 2004). In the context of the Madoff Scheme, individuals who were unsure of where to invest their money (a question of uncertainty) may have acted on the advice of experts within their social network and overvalued the quality of Madoff's work. This could have lead to reduced efforts exerted by investors in monitoring the performance of their assets. Moreover, if individuals were unsure of how much to invest (a question of ambiguity), they likely would have consulted their friends. By consulting other Jewish Americans on both with whom to invest and how much to invest, Jewish individuals may have suffered particularly heavily.

E. White-collar Crime & Religion

The fact that the network I explore is religiously based warrants further discussion. Studies have demonstrated in experimental settings that appealing to potential criminals' sense of religion or morality significantly decreases individuals' propensity to commit crime (Pruckner & Sausgruber, 2008). Levitt (2006) reaffirmed this finding through an investigation of crime and changes in public opinion. Interestingly, an appeal to moral codes (e.g. religion) seems to be more effective at deterring crime than threats of reputation costs (Schneider, 2009), formal legal penalties (Pruckner & Sausgruber, 2008), and the probability of being caught (Levitt, 2006). In order for crimes of trust to occur, the victim must have some reason to believe the offender is acting in good faith. Because a shared social network can promote trust between the offender and the victim, the strength of both weak and strong ties may increase the likelihood of white-collar crime. The net effect of Jewish network strength

on Madoff victimization is therefore theoretically unclear and thus warrants further

investigation.

III. DATA

A. Dataset Description

To construct a measure of Jewish network strength, I rely on a series of pre-constructed datasets. The first measure of Jewish network strength is the Urban Institute's National Center for Charitable Statistics' count of religious non-profit organizations per county. The data, created from organizations' 990 tax returns, include the total number of organizations in each county, the total revenue of religious non-profits in a county, the total assets of religious nonprofits in a county, the religious affiliation of each non-profit and total donations made by religious non-profits in a county. These data are separately provided for Jewish organizations as well. Because religious organizations are not required to file a Form 990 with the Internal Revenue Service, some counties may have an undercount of the number of Jewish nonprofits. Similarly, because tax laws of particular states and counties may be correlated with these non-profit measures as well as the number of Madoff investors, there is a potential for bias in my estimates.

To generate my dependent variables, I use data from a list of 13,563 individual Madoff victims that was generated by the SIPC, court-appointed attorney and trustee of Madoff LLC's remaining holdings.[3] This list contains individuals' names and addresses. It should be noted that there were some duplicates in this list; however, media outlets such as the Wall Street Journal and the Associated Press have speculated that this is because some individuals had multiple accounts over time, and not that these repeated listings were due to error (Wall Street Journal, 2009). I include all duplicates reasoning

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[3] Data from the Uniform Crime Report cannot be used because it does not measure white-collar crime (Federal Bureau of Investigation, 2005). Similarly, the National Crime Victimization Survey is of little use as most victims of white-collar crime do not know they are a victim to such crime.

that any miscounts are classical measurement error in the dependent variable. My dependent variable related to non-profit organizations comes from a complete list of all 148 non-profit organizations that used Madoff LLC as their investment manager. In this list, generated by a consultant to the New York Times, each non-profit organization is listed along with its business address, total assets, total revenue, and the amount invested in Madoff LLC as of the most recently completed IRS Form 990 filing. From these two data sources, I can create my dependent measures: 1) a binary measure for the presence of any Madoff victims in a county, 2) a count of individual Madoff victims per county and 3) a count of non-profit Madoff victims per county.

To address these issues, I include two additional measures of Jewish network strength that are likely unaffected by tax regulations. The second source of network measurement is the number of Kosher restaurants and catering halls in a county. I argue that the number of Kosher eating establishments is positively correlated with the size of a Jewish social network. The database I used was maintained by Hebrew College, supplemented by a series of nationally recognized Kosher-certification organizations (e.g. Star-K) and was current as of July 2009. I find that the number of kosher restaurants per county is highly correlated with the number of Jewish religious non-profits (ρ=0.74) and the revenue of those non-profits (ρ=0.75). However, the correlation between kosher restaurants and religious non-profits generally is weaker, with ρ equal to 0.65 and 0.46 respectively. Lastly, I include the number of the Jewish Community Centers and Young Men's Hebrew Associations in each county. These data come from the national JCC

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Association and were current as of July 2009.[4] The correlation between the number of

JCCs per county and the number of kosher restaurants is relatively strong (ρ=.67). While

the number of JCCs per county is highly correlated with the number of religious

organizations per county (ρ=.70), it is more weakly correlated with the per-county

number of Jewish religious organizations (ρ=.48), the revenue of those Jewish nonprofits

(ρ=.48) religious profits as a whole (ρ=.45). These correlations suggest that the number

of JCCs may be a measure of another aspect of the Jewish social network, as they are at

least not linearly related to the number or strength of Jewish nonprofit organizations yet

clearly are a part of the Jewish social network.

Since one would reasonably expect that Madoff victims were more likely to be in

wealthier and physically closer areas, it is important to control for such effects. While

annual Census Bureau estimates of the number of impoverished households per county

are easily accessible, the same is not true for estimates of the number wealthy

households. To overcome this obstacle, I estimate cross-sectional variation in high

income through the number of doctors per county in 2007 and the number of households

over grossing over $200k annually in the year 2000.[5] The county level measures are

taken from the Department of Health and Human Services' Health Resources Survey and

the 2000 Decennial Census provide these data, respectively. Although clearly neither

estimate is a perfect measure of high-income individuals in 2007, examining the

sensitivity of my results to either definition will help quantify the magnitude of the

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[4] Attempts to incorporate Jewish population estimates were unsuccessful as the U.S. Census does not ask
for individuals to identify their religion and estimates from the American Jewish Committee's *American
Jewish Year Book* were at varying and inconsistent geographic levels.

[5] In 2000, the correlation between the number of doctors and the number of households with over $200K in
income was over 0.9.

measurement error. Population and income measures are from the U.S. Census and the Bureau of Labor Statistics. To calculate the physical distance of potential victims from Madoff, I use geographic population weighted county centroids as calculated by the US Census Bureau. Centroid calculations are based upon information from the 2000 Census. I use Vincenty's formula to calculate these distances.[6]

B. Descriptive Statistics

While not taking into account the effects of wealth, descriptive statistics related to the geographic distribution of Madoff victims and the frequency and sizes of the various proxies for Jewish American social network strength are informative (Table 2). Quite noticeably, there were very few counties with Madoff victims (N=308) (Figure 1). Moreover, the 148 non-profit victims were limited to only 41 counties. As depicted in Figure 1, victims were particularly concentrated in the New York City, NY; Palm Beach, FL and Denver, CO metropolitan areas (Figure 2). On average, counties with any Madoff investors had significantly more victims (33.9) than the national average (3.33). The counties with Madoff victims help also contained 0.6 Jewish nonprofit organizations, on average. These same counties had Jewish organizations that grossed larger revenue and more religious organizations overall. Madoff-affected counties averaged 5.7 kosher restaurants, and 0.57 JCCs or YMHAs. All of these statistics are significantly different from the means of these variables for unaffected counties. The large number of zero-victim counties, however, necessitates cautious economic modeling.

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[6]Vincenty's formula, which accounts for the oblate spheroid shape of Earth, is commonly used as it has been proven to be the most accurate compared to other methods. Calculations are accurate to 0.005mm.

IV. ANALYTIC STRATEGY:

Approximately 90% of all US counties had no Madoff victims. Meanwhile, 2.7% of counties had one victim and 2.6% of counties had 11 or more victims, with an average of 116 victims per county. Due to this skewed distribution of victimization, I am interested in measuring factors that increased the probability of a county having any victims as well as what factors increased the total number of victims per county. I first estimate the importance of Jewish networks using a standard logit model that relates the extensive margin, or the probability of there being any Madoff victims in county c, to a set of demographic characteristics X_c, the strength of Jewish networks in that county $Religion_c$, the number of kosher restaurants in a county $Kosher_c$ and the existence of a Jewish Community Center JCC_c as follows:

$$(1) \quad \begin{aligned} P(AnyVictims_c) = &[\exp(\gamma' X_c + \kappa Distance_c + \theta' Religion_c + \rho' Kosher_c + \tau' JCC_c)] * \\ &[1 + \exp(\gamma' X_c + \kappa Distance_c + \theta' Religion_c + \rho' Kosher_c + \tau' JCC_c)]^{-1} \end{aligned}$$

I model the *number* of victims (i.e., the intensive margin) in a given county using a series of count models. In the first and most basic specification, I use a negative binomial count model, a generalized version of the Poisson count model. This model of the number of victims is:

$$(2) \quad Victim_c = \exp(\alpha + \delta' X_c + \lambda Distance_c + \beta' Religion_c + \rho' Kosher_c + \tau' JCC_c)$$

Where $Victim_c$ is the number of investors (individual or organizational) in county c.[7] There are several important independent variables in each of the models. $Distance_c$ measures the physical distance between the population weighted county center and

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[7] I do not specify any independent variables that could affect whether there are any victims in a county but not the number of victims, conditional on v_c being greater than zero. Neither economic theory nor institutional information directs me to any such variables. Instead, I allow the relationship between X_c and $Network_c$ to vary on the intensive (θ) and extensive (β) margins.

Madoff's nearest residence or office. $Network_c$, is the measure of the concentration of Jewish religious organizations in county c. I use four different measures of Religion: the number of Jewish religious organizations in the county, the percentage of organizations in a county that are Jewish, the total revenue of all Jewish organizations in fiscal year 2008 per county and the total number of religious organizations per county in 2008. An increase in the number of Jewish religious organizations should be positively correlated with both stronger Jewish informal networks and an increase in individual religious participation. However, contributions to religious organizations, which would also signal strong network presence in the community, have been shown to be a substitute for religious participation [Gruber (2005)]. A positive correlation between the number of victims and each of the Religion measures would suggest that religious devotion and participation is associated with increased vulnerability to being a Madoff victim.

I include JCC_c and $Kosher_c$ in order to account for ethnic Jewish network strength. Unlike data on religious organizations, the number of kosher restaurants and JCCs should be largely independent of county and state tax laws. Moreover, although JCCs commonly have a religious aspect to the organization, they are primarily locations for members to socialize in a non-religious context (e.g. friends going to the gym together) and these organizations often have non-Jewish members. Historically, JCCs, many of which were formerly called YMHAs (Young Men's Hebrew Associations) were established as opposition to the nation's YMCAs. The number of kosher restaurants represents a bridge between religious and ethnic network strength, as those who keep kosher are likely more religious Jews, while restaurants are commonly associated with friendship networks, regardless of religious affiliation. JCC_c is a count variable for the

number of JCCs within county c and Kosher$_c$ is a count of the number of kosher

restaurants in county c. A positive correlation between either or both of these variables

would suggest that increased Jewish ethnic and cultural networks increased susceptibility

to white-collar crime. In order to test how these network measures change with

closeness, I will explore possible heterogeneity in the impact of the social networks with

respect to distance by interacting my network measures with physical distance.[8]

I control for multiple potentially confounding variables. X is a matrix of county

characteristics including: the log of the county population, the log of median household

income, the percent of the county's population that is White (non-Hispanic), the percent

of the county's population that is over 65, the percent of the population that is over 65

and have a college degree and either the percent of households earning more than $200k

in 2000 or the number of doctors per county in 2007. The final two measures in

particular I predict should be highly correlated with white-collar crime victimization, as

they are likely to be predictors of participation in financial markets.

An important distinction to note when estimating crime related measures is the

difference between a marginal crime and the average crime. Using the Madoff scandal as

an example, a marginal victim would be a victim that is least likely to be victimized

given a change in practices, whereas the average victim is the victim with characteristics

that are the average of all known victims. This difference can result in sizeable

differences in estimates of victimization. For example, in criminal incarceration data the

average inmate in state prison may commit 12 crimes per year (DiIulio & Piehl, 1991;

DiIulio & Piehl, 1995), but the marginal prisoner affected by a sentence enhancement

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[8] In practice, I do this by calculating the value of $\partial^2 \text{Victim}/\partial\{\text{Network Measure}\}\partial \text{Distance}$ for each
observation and will present these mean values. Since neither model is linear, calculating the means of the
estimated coefficient on the interaction term is not the same magnitude or sign as the cross partial effect.

will likely commit only 1 crime per year (Owens, 2009). As the Becker model of criminal behavior postulates, the marginal crimes that are deterred by increases in the probability of apprehension will be the least beneficial to the victim, and likely the least harmful to the criminal (Becker, 1968). Such a model suggests that the marginal victim/crime and average victim/criminal may be fundamentally different. Therefore, for policy purposes, crime rates are typically better characterized by average characteristics rather than marginal characteristics.

While equation (2) uses more information on Madoff victimization, it is notable that the logit equations capture a large fraction of the total variation in victimization rates across counties. A-priori, it is unclear whether the effect of social networks on the probability of there being any victims in a county is that same as the effect on the number of victims. In order to assure that my estimates are not driven by misspecification of the victimization process, I will estimate three separate count models: a sub-sample of only counties with any victims, the full set of counties and full sample zero-inflated negative binomial. Using a zero-inflated negative binomial will allow me to relax the assumption that a constant relationship on the extensive and intensive margins exists.

The key coefficients are θ, β, ρ and τ, the estimates of the conditional correlation between informal religious social networks and victimization. If, on net, participation in a religious and ethnic informal network is associated with greater risk of white-collar crime, then the estimates of θ, β, ρ and τ will be greater than zero. Records of Madoff victims include both individual account holders and non-profit organizations. It seems plausible that individuals would be more influenced by informal networks than would corporations. In addition, the financial decisions made by non-profit board members are

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subject to regulation by the Internal Revenue Service and Better Business Bureau. If these regulatory agencies constrained the firm's behavior, the pattern of non-profit victimization should be less related to Jewish network strength. I predict that informal networks will better predict patterns of white-collar victimization for individual accounts than organizations' accounts.

V. RESULTS:

A. **Jewish Networks & The Probability of Victimization**

i. ALL INVESTORS:

I begin my analysis of the relationship between social networks and white collar crime victimization on the extensive margin. I report the mean marginal effects for the probability of any Madoff victims in a given county in Table 2. Results show that there is a positive relationship between the number of Jewish organizations and the likelihood of a Madoff victim in a county. On average, every ten new Jewish organization is associated with a 9 percentage point (se=3) increase in the likelihood of Madoff victims. Additionally, as criminal opportunity and social networking theory would predict, physical distance is consistently negatively associated with probability of victimization. Also worth noting, is that the percent of senior citizens with a college degree is a positive predictor of victimization. Though this contradicts traditional thought regarding the size of the educated senior population and traditional street crime, a positive relationship between the educated senior population and white collar crime has been widely demonstrated (Shover, 1998). Also consistent with theories of social distance and crime, areas with higher percentages of wealthy households is significantly related to the probability of victimization. For instance, in Model 1, an increase of 1% in the households making more than 200k is associated with a 1.89% point (se=0.50) increase in the likelihood of a victim. These last two relationships hold for analysis using all Jewish network measures. Upon first glance, Madoff may have been exploiting both Jewish and high-income social networks.

To further evaluate the validity of this statement, I consider both the relative number of Jewish organizations to other religious organizations and those organizations' size, as measured by revenue. Model 2 includes the total number of religious organizations and the percentage of Jewish organizations in a county. Thus, one can consider the Jewish organization ratio variable as a change in the affiliation of one of the organizations in the county. According to the regression, for every 1% increase in the percent of Jewish organizations in a county, there is approximately a 0.8% (se=0.23) point increase in the likelihood of having Madoff victims in a county. The fact that this relationship exists while there is no relationship between probability of victimization and the total number of religious organizations in a county further may support the idea that Madoff specifically targeted Jews and also may support the argument that Jews were seeking out Madoff. Otherwise, one would have necessarily seen a relationship between likelihood of victimization and the total number of religious organizations and may have seen a relationship between victimization and the percentage of Jewish organizations. A similar relationship exists in Model 3, where conditional on the total revenue of religious organizations, a 1% change in religious revenue being redirected to Jewish organizations is associated with a 0.15% point increase in the probability of victimization. While total revenue is the amount of money an organization has, it also can be considered a measure for the visibility of an organization. For example, organizations with higher revenues are more likely to have public functions, like religious schooling, fairs and community outreach.

Using the alternative methods of measuring Jewish social networks, the number of Kosher restaurants (Model 4) and the number of JCCs (Model 5), I find consistent

results. For each additional Kosher restaurant in a county, there is a 2.7% point (se=0.6) increase in the likelihood of victimization. In addition, each JCC in a county translates into a 5.6% point (se=1.5) increase in the likelihood of a victim. These results are particularly interesting as they show that regardless of local or state tax benefits that a religious institution would have, the number of religiously affiliated businesses and meeting areas can be used to predict Madoff victimization. The combination of these and prior results, including a joint test that all network measures are equal to zero, which is rejected at the 99.99% confidence level, suggests that Madoff was targeting Jews as potential victims.

To evaluate my hypotheses related to physical proximity, I focus my analyses on the geographic distance measure. Analyses reveal that each increase of 1,000km in the minimum distance between Madoff and a victim translates into roughly a 2% point decrease in the likelihood of victimization. As Zapf (1949) argued, *ceteris paribus*, Madoff's cost of contacting an individual should have increased proportional to the distance between him and the individual. Thus, an analysis of the interaction of each network measure and distance is appropriate. Figure 3 shows a sizeable level of heterogeneity in the effect of proximity on social networks. As distance increases, the effect of Jewish organizations on victimization falls faster in places where there is the lowest probability of victimization. However, in likely areas of Madoff victimization (i.e. high levels of income, education) that are physically distant from Madoff, the positive relationship between Jewish organizations and victimization is ever larger than it is in areas close to Madoff. Therefore, the predictive power of social network variables related to Madoff become increasingly large as physical distance increases.

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Similar patterns of heterogeneity when measuring informal networks using the

percentage of all religious organizations that are Jewish (Figure 4), the percent of all

religious revenue that goes towards Jewish organizations (Figure 5), the number of

Kosher restaurants (Figure 6) and the number of JCCs (Figure 7). The measure that was

most correlated with victimization on average, the fraction of religious organizations that

were Jewish, appears to decay the least with geographic distance. I can reject the null

hypothesis that these informal networks do not decay with distance with 95% confidence

in only the areas with the lowest probability of victimization.

While the estimated relationships are in large highly significant and robust to

measures of distance and income, in order to verify these results, I substituted the number

of doctors in 2007 for the percent of households with incomes over $200 thousand

counted in the 2000 Decennial Census. As I have previously mentioned, the two

variables in the year 2000 are highly correlated (r>.90). Thus, using the 2007 count of

the number of doctors may provide a more current estimate of the number of wealthy

individuals in a county. By rerunning the same logistic models with the number of

doctors as the measure of county wealth, I find very similar results. In each case, the

pseudo R-squared is similar in magnitude, often deviating by less than 0.10.

Additionally, a visual comparison of the signs and magnitudes of coefficient estimates

yield consistent results. For all estimates in all models, signs and magnitudes are

consistent. For example, each additional Jewish organization increases the probability

ofa county having a Madoff victim by 0.9% points (se = 0.3). Moreover, each 1%

increase in the number of Jewish organizations, holding the total number of religious

organizations constant, results in a 0.88% point (se=0.18) increase in the probability of a

Madoff victim and a 1% increase in the percent of revenue going to a Jewish religious organization results in a 0.13% point (se=0.41) increase in the likelihood of Madoff victimization. Differences in these estimates compared to previous models are negligible. Similar comparisons also hold for estimates using the number of Kosher restaurants[9] (β=0.025, se=0.007) and the number of JCCs per county (β=0.050, se=0.016) (Table 8). These comparisons further demonstrate that the previously discussed estimates of likelihood of Madoff victimization based upon my independent variables are robust.

ii. NON-PROFIT INVESTORS:

The likelihood of non-profit victimization is likely different from that of individual and overall victimization patterns. Such differences may be explained because non-profit organizations' (NPO's) decisions to invest often fall to a board of directors. These choices are also often subject to government regulation and oversight. Therefore, there is a duty of a company's officers to investigate more heavily into potential investments. Moreover, majority consent is often required in Board structures and so unlike where one individual may decide whether to invest, multiple individuals here must agree before action is taken. However, NPO Boards are often full of high-status individuals, who are more likely to be familiar with Madoff. These stronger distant connections may have lead NPOs to invest more with Madoff. Therefore, based upon the ambiguous net effect of NPO Boards on Madoff victimization, I choose to run separate analyses on this subset of victims.

Results displayed in Table 4 suggest that differences in victimization patterns likely do exist. In fact, all three religious organization measures (the number of Jewish

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[9] Analyses using the percent of kosher restaurants per county yield similar results in sign and magnitude for all analyses.

organizations, their relative revenues and their relative prevalence per county) are all indistinguishable from zero. Moreover, the number of kosher restaurants plays an insignificant role in modeling victimization. Intuitively this seems logical, as an NPO is less likely affected by small business and community relationships than would be individuals. However, the number of JCCs in a county is a significant predictor in the probability of Madoff victimization. Following the results in Table 4, each JCC accounts for an approximate 0.4% point (se=0.2) increase in the likelihood that a Madoff victim will be in a given county. Additionally, geographic distance from Madoff continues to play a distinct, significant role in the likelihood of victimization with the likelihood of victimization decreasing by 0.3% points (se=0.01) for every 1,000km the county is from Madoff's closest home location. Also worth noting, with the exception of seniors with at least a college degree, the demographic characteristics of the county, including wealth, become insignificant predictors. Presumably, the average NPO is more detached from its surrounding community, so one would expect these local networks to play a weak role, if any, in corporate investments.

Further consideration suggests the differences in the relationship between Jewish religious institutions and geographic distance for non-profit and individual victims. Unlike in individual victim analysis, where a clear upward sloping trend existed between physical distance and strengthening of the informal networks was present, on average there is no significant spatial deterioration or strengthening of the informal networks. One exception does hold. That is, in counties with approximately a 60% chance of victimization, the predicative power of Jewish network strength, particularly as measured by the fraction of organizations that are Jewish, is higher in areas located further from

Madoff. Overall, one can summarize these findings by stating that in counties distant from Madoff, where the observed predictors do not clearly predict victimization, the proxy for the strength of weak ties is a better predictor of victimization.

B. Jewish Networks & The Amount of Victimization

Having established the positive relationship between Jewish social network measures and the likelihood of Madoff victimization in a county, I now examine the intensive margin of victimization. I conduct these analyses because it seems unclear whether the probability of any victimization in a county and the level of victimization, measured in quantity of investors, should be the same. I model the number of victims in a county in three ways. First, I restrict the sample to only counties with any Madoff victims (Models 1 and 4). Next, I estimate model (2) and (5) for all counties, which considers all counties, regardless of the number of Madoff victims. These models restrict the coefficients of equation (1) and equation (2) to be equal by imposing the assumption that $\theta = \beta$. Finally, I present results from a zero inflated negative binomial model (Models 3 and 6). This essentially process produces weighted averages of the results of models (1) and (2). This specification allows for variation in the effects of Madoff on the intensive and extensive margins of victimization.

i. ALL INVESTORS

Table 6 displays partial elasticities for the various count models, where the number of all Madoff investors in a county is the dependent variable in each model. Previously, in the logistic analyses, the number of Jewish organizations predicted the likelihood of there being any victims. However, models using this network measure to estimate the increase in victimization rates (the top panel) prove to be statistically

indistinguishable from zero. In summary, areas with more Jewish organizations were more likely to have at least one victim, but in areas where network ties did exist seem to have no measurable effect on increasing the victimization rate.

Although increasing the total number of Jewish organizations had no effect on victimization rates, the conversion of one non-Jewish organization to a Jewish organization does impact the number of victims (the second panel). A one standard deviation (2.2% point) increase in the percent of organizations that are Jewish is associated with a roughly 28% increase in the number of victims when there is at least one victim in a county, a 51% increase in the overall number of victims, or a 31% increase when one allows for a structural break between the intensive and extensive margins. Undoubtedly, these effects are quite sizeable and suggest that the relative concentration of Jewish social networks in an area plays an important role when considering the quantity of victimization in a county.

Using relative revenue to measure network strength (bottom panel) reveals similar results. Conditional on the total revenue of religious organization in the county, a one standard deviation (5.6 percentage points) increase in the fraction of revenue which goes to Jewish organizations is associated with a 26% increase in victimization among victimized counties. Combining the intensive and extensive margins provides a slightly larger increase, 28%. Nonetheless, the difference between these estimates is not statistically significant. The relative magnitudes of both the revenue based and institutional based effects are the same for the extensive and intensive margins.

Similar to the results when examining the relationship between victimization levels and the number of Jewish organizations, I find no significant relationship for the

number of JCCs or Kosher restaurants in a county and victimization rates. This supports

the pattern that the absolute number of Jewish-American organizations does not affect

Madoff victimization. Each of these findings is robust to the inclusion of measures of

population age, education, median income and wealth. Indeed, the best predictors of

determining the intensity of Madoff victimization is relative strength of Jewish social

networks compared to other religious networks.

Physical distance, as measured in this study, between Madoff and his victims is a

consistent predictor of extensive victimization, but there is no statistically precise

relationship between distance and the number of victims in a county. More notably,

however, there is significant heterogeneity in the predictive value of religious ties with

respect to geography. Inspection of counties that had at least one victim (column 4)

shows that the interaction between concentration based measures of network strength and

geographic distance is positive and statistically different from zero over 95% of the time.

In other words, as one moves further from Madoff, the fraction of all religious

organizations and the fraction of all revenue going to Jewish organizations become

stronger predictors of the number of victims. Consistent with network theory, geographic

closeness of Madoff to potential victims and Jewish network strength appear to be

substitutes in predicting victimization. The importance of this interaction effect is

weaker when determining the probability of there being any victims, as the interaction

effect is generally statistically insignificant when the intensive and extensive effects are

restricted to be equal. Relax this restriction (column 6), however, shows that the

concentration of Jewish organizations and Jewish religious revenue is positively

correlated with county victimization, and the magnitude of this relationship is larger the further away one moves from Madoff.

Again, these results seem to be robust to the substitution of the number of wealthy households per county in the year 2000 with the number of doctors per county. Again, the signs, magnitudes and significance of each of the mean partial elasticities are roughly equal. For example, a one standard deviation increase in the percent of Jewish organizations in a county for counties with any Madoff victims is associated with a 27.5% increase in the number of Madoff investors, compared to the previously computed 28% using household wealth as the measure. There are also only marginal increases in the number of victims per county when examining relative Jewish revenue in counties: using wealth data, the estimate is a 26% increase in the number of victims compared to a 24% increase when using the number of doctors per county. Again, there are no significant relationships between the number of victims and the number of Jewish organizations, number of kosher restaurants or the number of JCCs in a county. Measures of heterogeneity do differ when using the number of doctors as the measure of wealth in a county. Although there is a significant relationship between the interaction of distance and the percent of Jewish organizations, the interaction between distance and relative revenue is statistically imprecise. However, the partial elasticity for the interaction of the number of JCCs and distance is significant. Overall, there is little change to the previously discussed findings when one considers the alternative measure of wealth in a county.

ii. NON-PROFIT INVESTORS

Table 7 displays the results of examining the number of non-profit victims on the intensive margin. Similarly, to the individual victim intensive margin, the number of Jewish organizations, the number of kosher restaurants and the number of JCCs in a county are largely insignificant. In the case of the absolute number of Jewish organizations, in addition to being insignificant, the magnitude of the partial elasticities is inconsequential. Furthermore, there is no statistically significant relationship between the concentration of Jewish organizations and the number of victims.

In stark contrast, the fraction of revenue generated by Jewish organizations is a sizeable predictor of non-profit victimization. Recall that the revenue measure was a weak, but positive, correlate with the probability of their being any Madoff victims. In contrast, a one standard deviation (0.7% point) increase in the relative amount of religious revenue going to Jewish organization results in between a 3% and 4% increase on the intensive margin, depending on the victimization model used. These results suggest that while the relative revenue was a weak predictor of there being any victims in a county, once there was at least one victim, this variable becomes an important predictor in estimating the total number of victims.

Unlike individual victimization, there is no strong spatial heterogeneity in the relationship between networks and organizational victims. Statistically significant spatial heterogeneity occurs in less than 17% of the sample's observations, and it is generally weakly negative, suggesting that network strength is weaker as one moves away from Madoff. It is important to note that non-profit locations in this data set are dependent on the corporate address of the non-profit, which may be weakly or unrelated to board members' addresses. As a result, distance may be imprecisely measured and may

introduce attenuation bias in my estimates of the effect of geographic closeness, making it more difficult to identify a non-zero relationship. Again, all intensive margin estimates of non-profit victimization are robust to the substitution of the county wealth measure with the number of doctors in a county.

VI. CONCLUSION

Typically when one thinks of white collar crime, Nigerian scams and other telephone and Internet scams come to mind. However, corporations commit most white collar crime (Posner, 1979). As previously described, white collar crime is an abuse of trust (Shover, 1998). Thus, social networks may play an important role in the incidence of white collar crime. Prior to this study, however, the correlates of modern white collar crime were largely unknown as it is often difficult if not impossible to accurately measure or contact the victims of such offense. As a result, testing the theoretical effects of inciting religion, social networks and distance on the commission of white collar crime is difficult. In these ways, the Madoff case raised a particularly interesting opportunity to examine each of these questions.

Results from this study show that social networks, particularly religious social networks, have serious consequences for both the probability of victimization and the intensity of victimization. I show that despite the likely increased costs of investing with an unknown, risky investor, individuals in counties with strong Jewish social networks were more likely to invest with Madoff. Moreover, I find that when the network, as measured by both the relative concentration of Jewish organizations and the relative revenue of Jewish organizations in a county, was stronger, more individuals invested with Madoff. Thus, it seems prudent that individuals recognize the potentially negative effects of participating in transactions with individuals within their own social networks.

This study also highlighted the effects of distance on victimization which Zipf (1949) so clearly asserted. Examining the first order effect of distance, I find a consistently negative relationship between distance and likelihood and level of

victimization. However, this negative effect is often smaller than the positive

relationships between victimization and network strength. Continued analysis of the

distance measure reveals a more meaningful description of distance's relationship to

victimization. I find that as the physical distance from Madoff increased, the importance

of Jewish network strength steadily increased. This result suggests that victims likely

increasingly relied on information passing through these networks as other possible

routes to discerning the quality of Madoff's firm became more costly. I propose that

individual investors' reliance on information spread though the Jewish social network

aided in Madoff's commission of the largest Ponzi scheme in US history.

Relative to indirect victimization, Jewish network strength and the geographic

distribution of non-profit Madoff victims are only weakly related. In fact, a significant

relationship exists between victimization and only the amount of revenue generated by

Jewish organizations, not the number or concentration of those organizations. I conclude

that the boards of non-profit foundations rely less on informal networks than do

individual investors in making investment decisions, and are therefore less susceptible to

victimization in crimes of trust. The fact that this relationship becomes weaker as the

geographic distance between the non-profit and Madoff increases highlights that

alternative personal connections between board members and Madoff may have played a

role.

While Madoff's Ponzi scheme clearly had seriously negative consequences on the

US economy and society, overall it provided an excellent opportunity to study and craft

effective policy to prevent future white collar schemes. This study has served to

highlight that while inciting religion may help to decrease street crime, the use of religion

can foster white collar schemes and victimization. This suggests that there may be an increased purpose for the government to supervise organizations and individuals who are perceived to be associated with religious networks. There also may be cause to terminate boutique investment firms' exemptions from federal monitoring. It seems quite plausible that had Madoff been required to submit to detailed federal oversight, he likely would not have been able to continue his scheme without detection. Increased federal oversight would help limit the negative effects of asymmetric information on behalf of investors who do not realize there is a lack of oversight and investors who cannot accurately ascertain the value of the assets sold by firms like Madoff LLC. In summation, this study highlights the importance of careful evaluation of investments rather than relying on information spread through informal, and likely ill-informed, social networks.

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APPENDIX

Figure 1. Presence of Madoff Victims by County
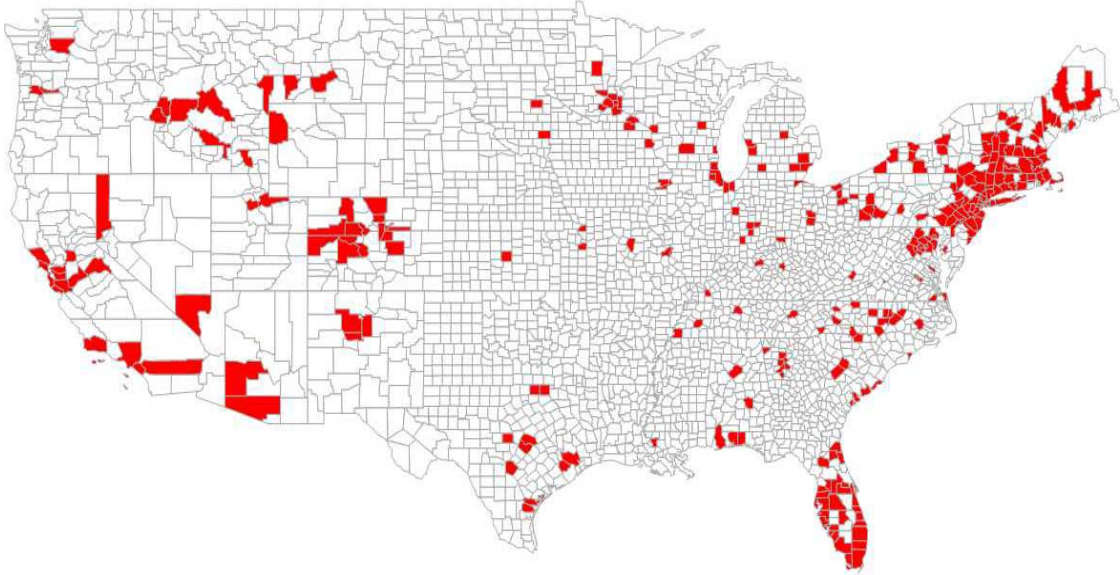
Figure 2. Concentration of Madoff Victims by County
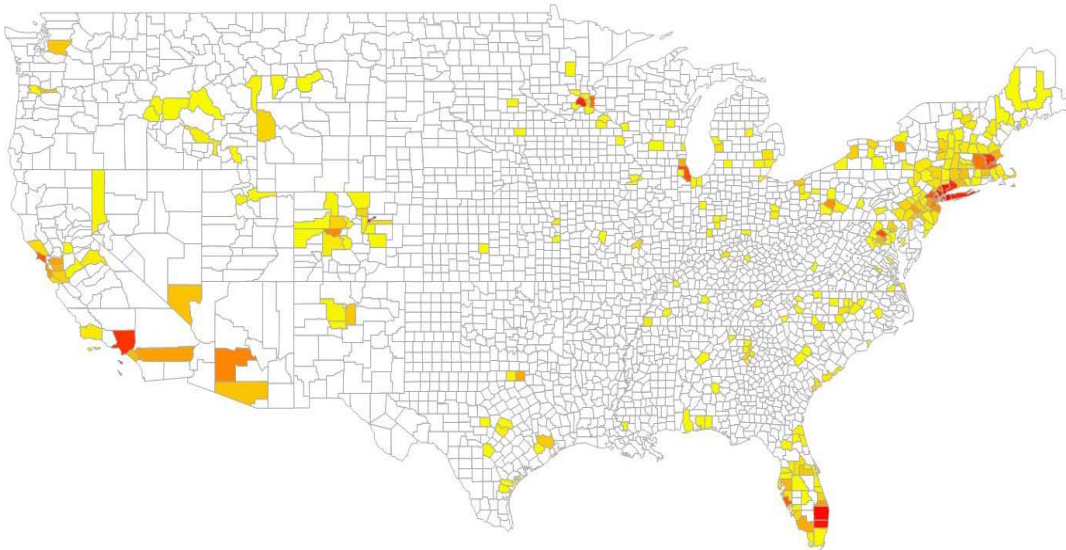
Figure 3: Heterogeneous Effects of the Number of Jewish Organizations on
All Victimization
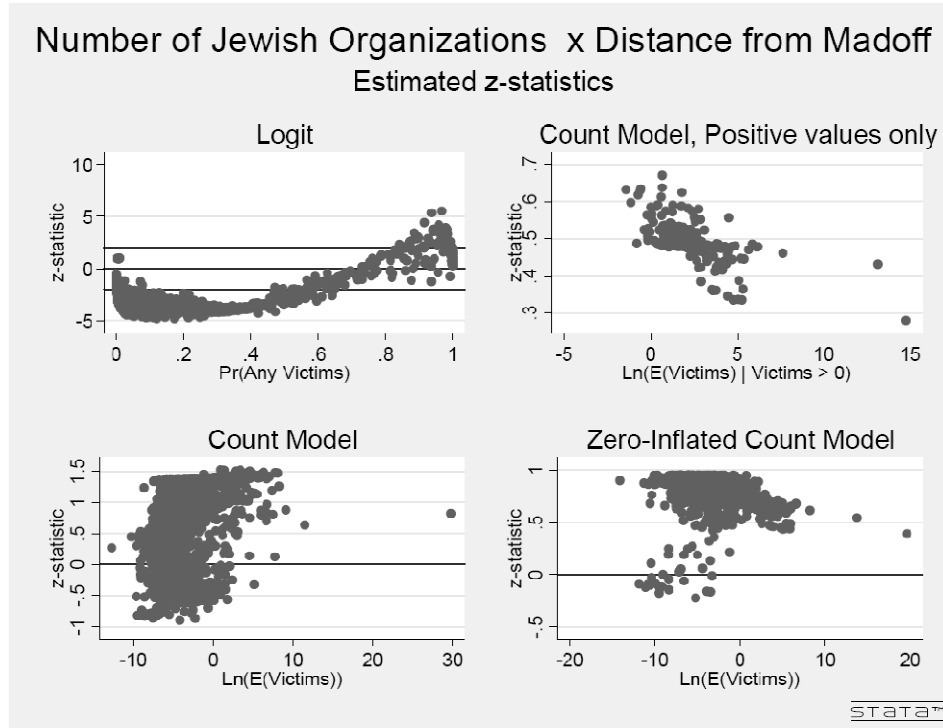
Figure 4: Heterogeneous Effects of the Percent of Organizations that are Jewish on
All Victimization
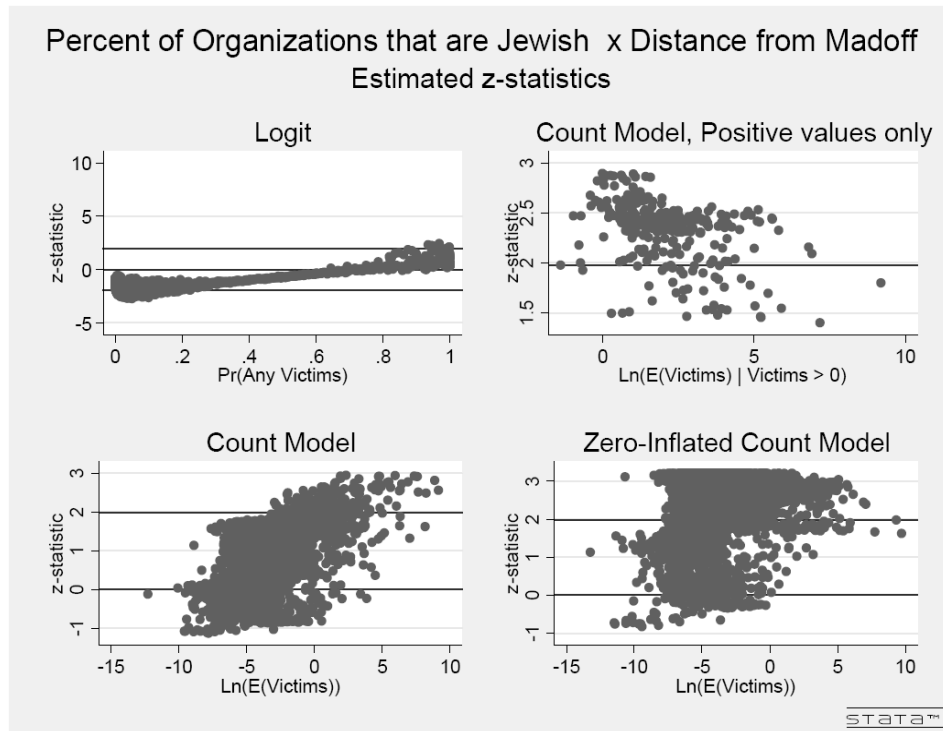
Figure 5: Heterogeneous Effects of the Percent of all Revenue collected by Jewish Organizations on All Victimization
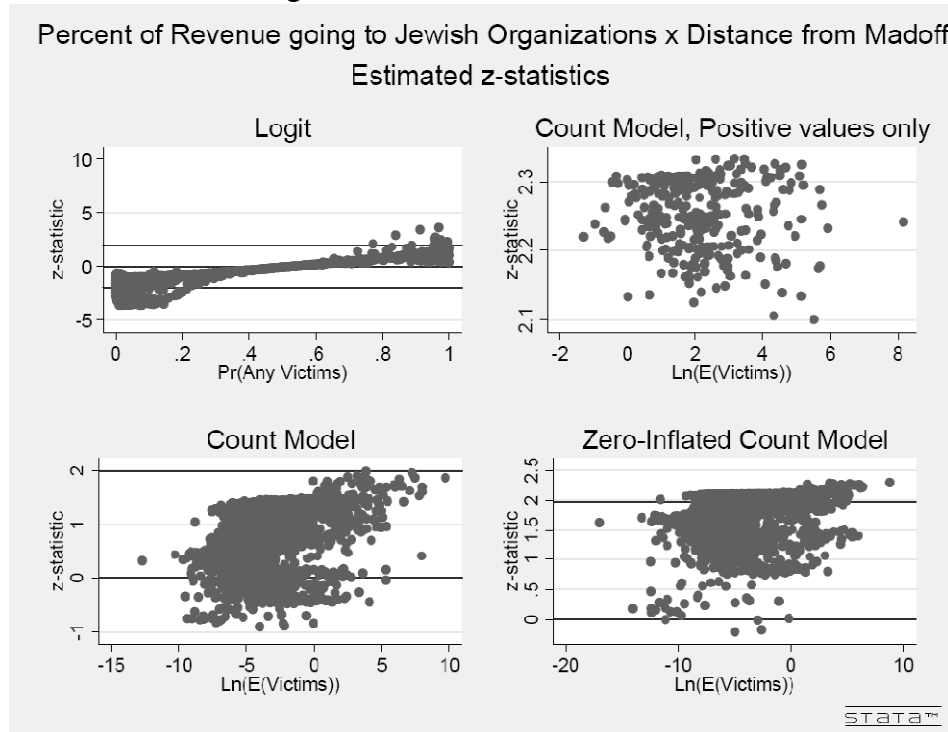
Figure 6: Heterogeneous Effects of the Number of Kosher Restaurants on on All Victimization
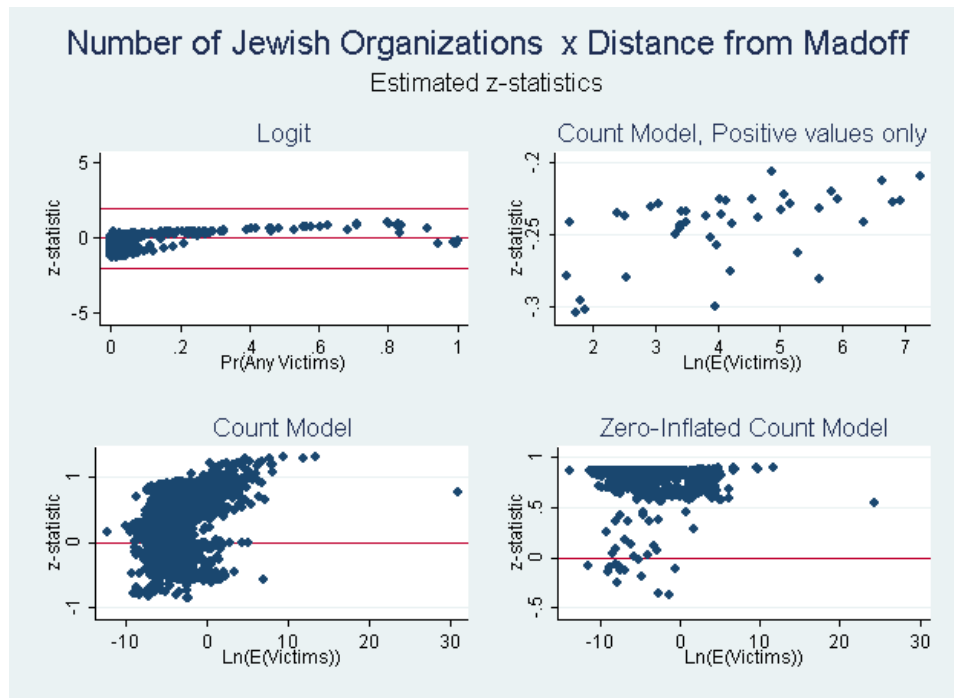
Figure 7: Heterogeneous Effects of the Number of Jewish Community Centers on All Victimization
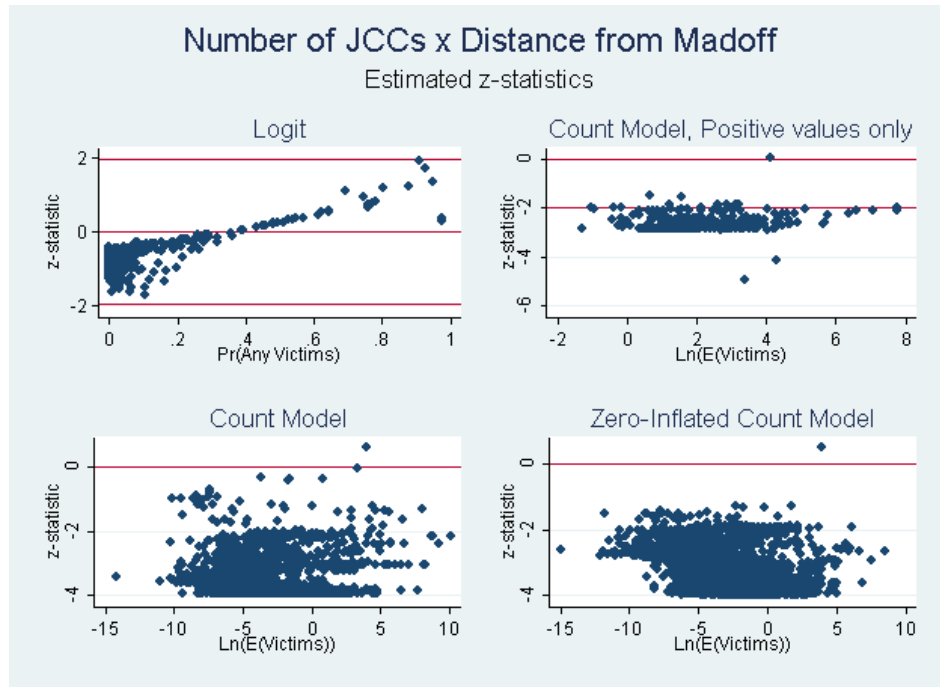
Figure 8: Heterogeneous Effects of the Number of Jewish Organizations on Non-Profit Victimization
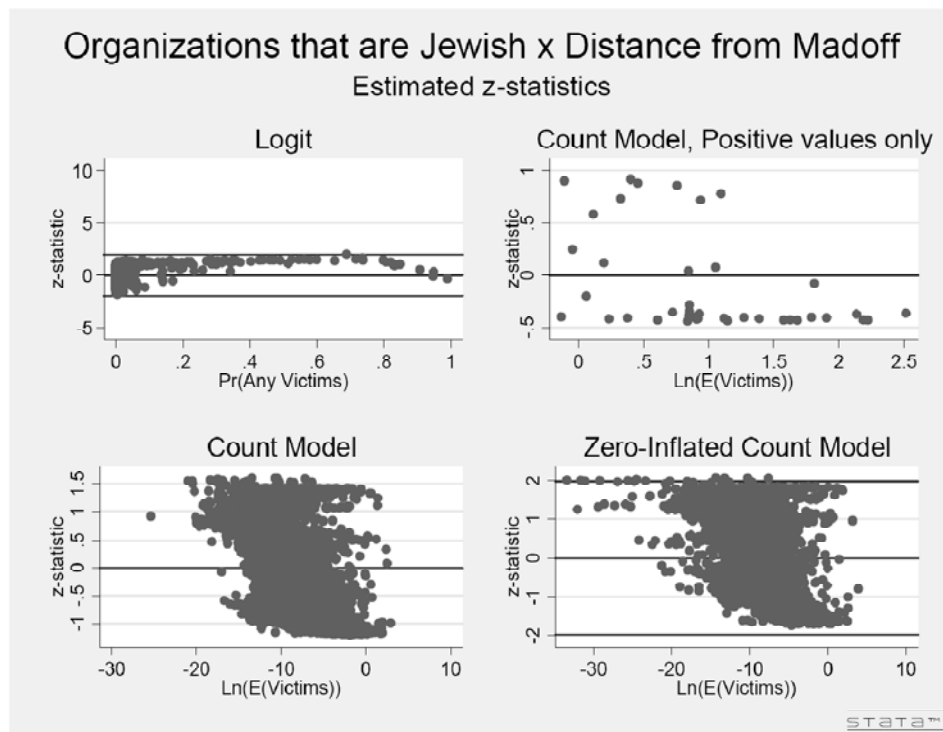
Figure 9: Heterogeneous Effects of the Percent of Organizations that are Jewish on Non-Profit Victimization
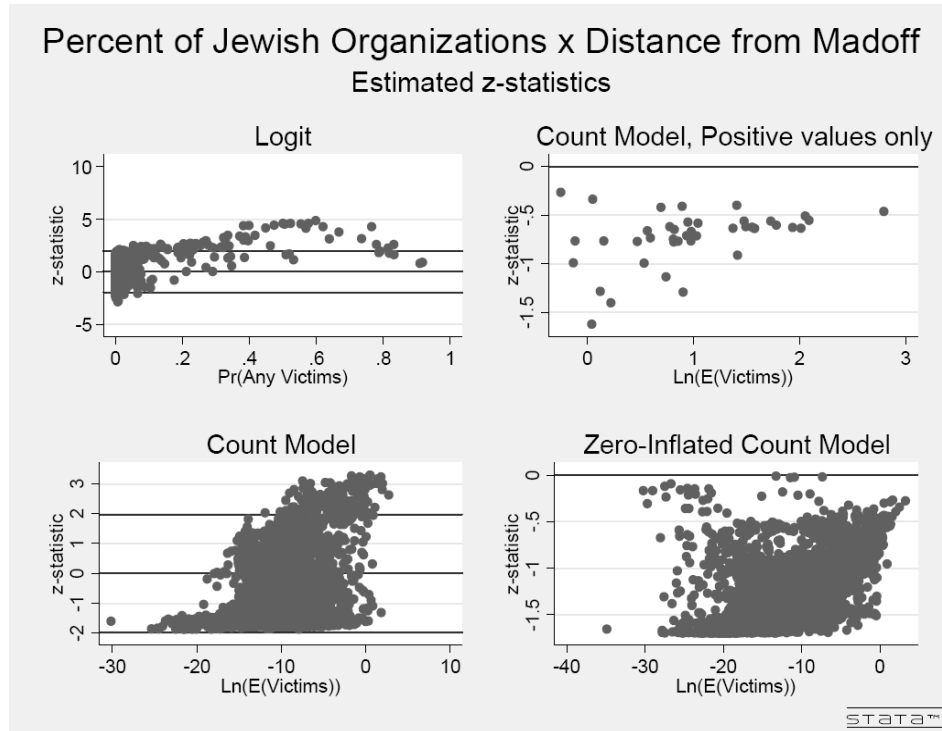
Figure 10: Heterogeneous Effects of the Percent of all Revenue collected by Jewish Organizations on Non-Profit Victimization
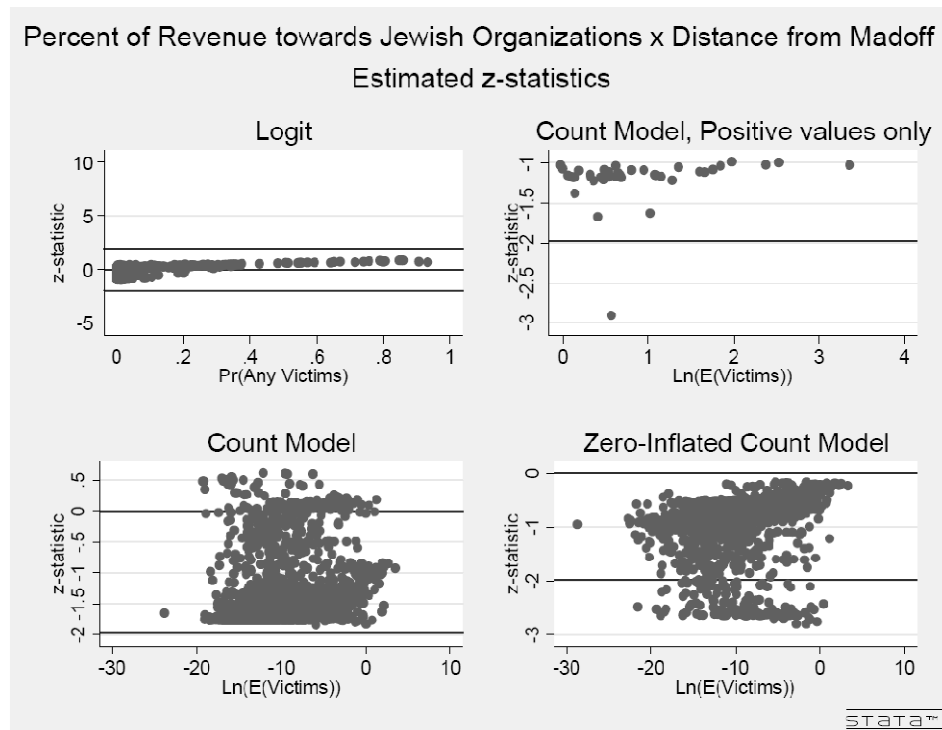
Figure 11: Heterogeneous Effects of the Number of Kosher Restaurants on Non-Profit Victimization
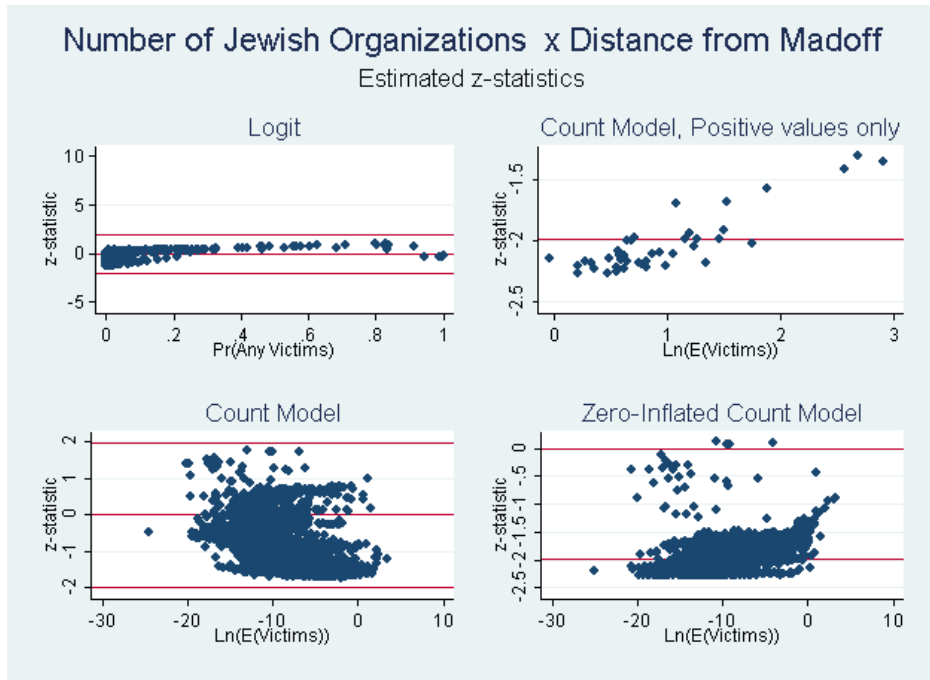
Figure 12: Heterogeneous Effects of the Number of Jewish Community Centers on Non-Profit Victimization
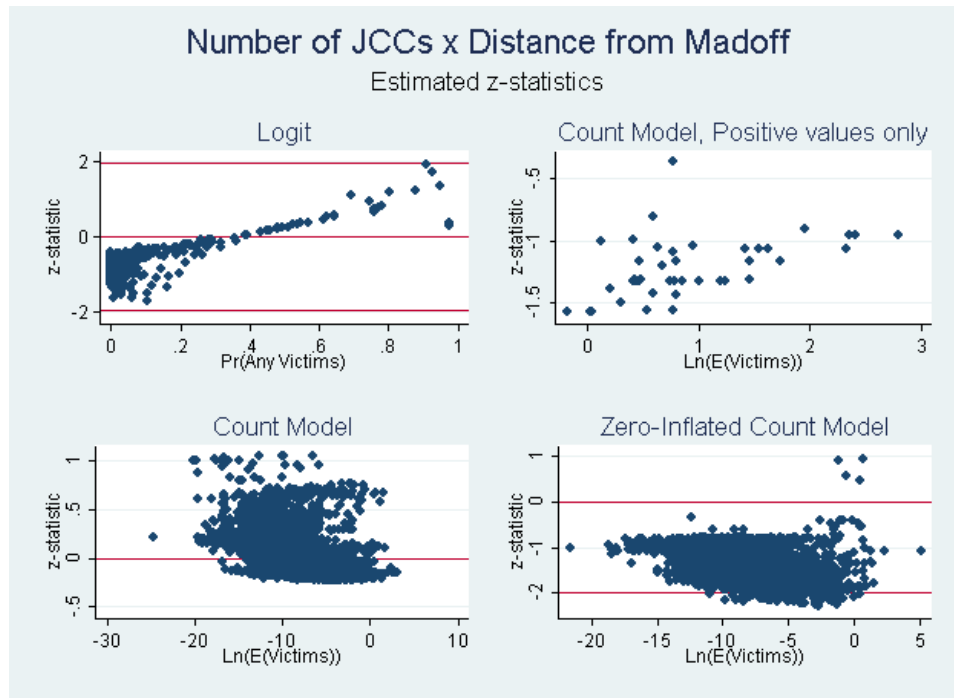
Table 1: Characteristics of Madoff Victims and Victimization by County

	All Counties n=3,141	Any Clients n=308	No Clients n= 2,833	p(difference) = 0
Number of Clients	3.33	33.9	0	.0000
	[49.7]	[156]	[0]	
Non-Profit Clients	.0471	.464	.00177	.0000
	[.817]	[2.57]	[.062]	
Assets Invested with Madoff (10k)	72.4	734	0.51	.0000
	[2,060]	[6,560]	[193]	
Religious Organizations, 2008	68.0	368	35.4	.0000
	[242]	[669]	[74.7]	
Jewish Organizations, 2008	1.86	17.6	0.148	.0000
	[31.2]	[98.4]	[0.816]	
Jewish Organizations / Religious Organizations	0.005	0.028	0.002	.0000
	[0.022]	[0.057]	[0.001]	
Revenue of Religious Organizations, 2008 (100k)	43.1	303	14.9	.0000
	[269]	[777]	[79.7]	
Revenue of Jewish Organizations, 2008 (100k)	2.18	21.4	0.956	.0000
	[36.7]	[116]	[1.56]	
Total Rev. of Jewish Org./ Total Rev. of Religious Org.	0.007	0.053	0.002	.0000
	[0.056]	[0.131]	[0.036]	
Kosher Restaurants, 2009	.577	5.70	.0201	.0000
	[6.44]	[19.9]	[.209]	
JCC Organizations	0.061	.565	.006	.0000
	[0.41]	[1.19]	[.082]	
Number of Doctors, 2007	253	1776	88.13	.0000
	[1084]	[2943]	[293]	
Population, 2008	96,803	519,698	50,827	.0000
	[312,135]	[830,013]	[108,526]	
Per Capita Income, 2008	42,705	55,875	41,274	.0000
	[10,959]	[14,587]	[9,443]	
Percent White, Non-Hispanic, 2007	86.5	82.9	86.9	.0000
	[16.0]	[14.0]	[16.2]	

Standard deviations in brackets.

Table 2: Mean Marginal Effects from Logit Estimates of Madoff Victimization: All Investors						
	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Organizations	0.009 [0.003]					0.001 [0.004]
Jewish Organizations / Religious Organizations		0.864 [0.231]				0.458 [0.249]
Total Rev. of Jewish Org./ Total Rev. of Religious Org.			0.152 [0.043]			0.070 [0.042]
Religious Organizations		4.26×10^{-5} [3.62×10^{-5}]				-9.76×10^{-6} [3.00×10^{-5}]
Total Revenue of Religious Org. (100k)			1.48×10^{-10} [1.12×10^{-10}]			5.70×10^{-13} [1.48×10^{-10}]
Kosher Restaurants				0.027 [0.006]		0.021 [0.007]
JCC Organizations					0.056 [0.015]	0.024 [0.016]
JCC Satellites					0.015 [0.050]	-0.050 [0.045]
Geographic distance from Madoff	-0.021 [0.005]	-0.020 [0.005]	-0.020 [0.005]	-0.017 [0.005]	-0.019 [0.005]	-0.016 [0.004]
Ln(Median Income)	0.021 [0.024]	0.028 [0.025]	0.017 [0.025]	0.022 [0.024]	0.025 [0.249]	.030 [0.024]
Percent White	0.071 [0.041]	0.051 [0.043]	0.057 [0.040]	0.077 [0.041]	0.072 [0.043]	0.068 [0.045]
Percent 65+	-0.075 [0.133]	-0.008 [0.131]	-0.034 [0.132]	-0.072 [0.132]	-0.049 [0.133]	-0.062 [0.131]
Percent of 65+ with college degree	2.195 [0.425]	2.130 [0.446]	2.302 [0.439]	2.002 [0.460]	2.323 [0.431]	2.050 [0.419]
Percent HH with Income 200k+	1.878 [0.497]	1.704 [0.503]	2.360 [0.495]	2.083 [0.485]	2.082 [0.431]	1.563 [0.484]
$\chi 2$	358.65	402.13	408.89	399.62	409.40	411.18
Pseudo R^2	0.52	0.51	0.51	0.52	0.51	0.53

All models include 3,139 observations, and include a control for the natural log of county population. Robust standard errors in brackets.

Table 3: Mean Marginal Effects from Logit Estimates of Madoff Victimization: All Investors with Distance Interactions

	(7)	(8)	(9)	(10)	(11)
Jewish Organizations	0.019 [0.005]				
Jewish Organizations / Religious Organizations		1.026 [0.354]			
Total Rev. of Jewish Org./ Total Rev. of Religious Org.			0.156 [0.066]		
Religious Organizations		1.39×10^{-5} [4.82×10^{-5}]			
Total Revenue of Religious Org. (100k)			1.49×10^{-10} [1.12×10^{-10}]		
Kosher Restaurants				0.024 [0.007]	
JCC Organizations					0.062 [0.020]
JCC Satellites					0.139 [0.063]
Geographic distance from Madoff	-0.012 [0.006]	-0.011 [0.006]	-0.019 [0.005]	-0.018 [0.005]	-0.019 [0.005]
Distance x Jewish Organizations	-4.43×10^{-6} [-1.30×10^{-6}]				
Distance x Jewish Organizations / Religious Organizations		-0.125 [0.174]			
Distance x Jewish Rev. / Religious Rev.			-8.83×10^{-6} [5×10^{-5}]		
Distance x Kosher Restaurants				0.004 [0.005]	
Distance x JCC Organizations					-0.005 [0.011]
Ln(Median Income)	0.026 [0.024]	0.034 [0.025]	0.057 [0.040]	0.019 [0.024]	0.024 [0.024]
Percent White	0.067 [0.043]	0.063 [0.045]	0.057 [0.039]	0.084 [0.042]	0.075 [0.044]
Percent 65+	-0.072 [0.125]	-0.011 [0.129]	-0.033 [0.132]	-0.081 [0.131]	-0.052 [0.132]
Percent of 65+ with college degree	2.088 [0.417]	1.651 [0.437]	2.300 [0.439]	2.278 [0.423]	2.330 [0.429]
Percent HH with Income 200k+	1.763 [0.468]	1.651 [0.506]	2.360 [0.494]	2.014 [0.464]	2.089 [0.484]
$\chi 2$	389.60	459.49	431.26	396.86	424.09
Pseudo R^2	0.52	0.52	0.51	0.52	0.51

All models include 3,139 observations, and include a control for the natural log of county population.
Robust standard errors in brackets.

Table 4: Mean Marginal Effects from Logit Estimates of Madoff Victimization: Non Profit Investors

	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Organizations	3.64×10^{-5} [2.77×10^{-5}]					3.37×10^{-5} [0.0001]
Jewish Organizations / Religious Organizations		0.031 [0.018]				-0.013 [0.068]
Total Rev. of Jewish Org./ Total Rev. of Religious Org.			0.013 [0.010]			-0.004 [0.018]
Religious Organizations		-1.21×10^{-6} [1.84×10^{-6}]				-8.29×10^{-6} [4.56×10^{-6}]
Total Revenue of Religious Org. (100k)			-1.29×10^{-11} [1.54×10^{-11}]			-6.08×10^{-13} [1.91×10^{-11}]
Kosher Restaurants				2.32×10^{-4} [0.0001]		2.67×10^{-4} [2.04×10^{-4}]
JCC Organizations					0.004 [0.002]	0.002 [0.003]
JCC Satellites					-0.003 [0.002]	-0.0004 [0.003]
Geographic distance from Madoff	-0.003 [0.002]	-0.003 [0.002]	-0.003 [0.001]	-0.003 [0.001]	-0.003 [0.002]	-0.002 [0.001]
Ln(Median Income)	-0.003 [0.002]	-0.007 [0.011]	-0.006 [0.011]	-0.002 [0.010]	0.0007 [0.011]	-0.004 [0.010]
Percent White	0.021 [0.018]	0.018 [0.017]	0.015 [0.017]	0.022 [0.019]	0.021 [0.019]	0.023 [0.018]
Percent 65+	-0.028 [0.052]	-0.037 [0.055]	-0.037 [0.056]	-0.035 [0.050]	-0.029 [0.052]	-0.054 [0.054]
Percent of 65+ with college degree	0.341 [0.172]	0.369 [0.182]	0.361 [0.189]	0.357 [0.163]	0.349 [0.168]	0.412 [0.173]
Percent HH with Income 200k+	0.195 [0.121]	0.199 [0.125]	0.217 [0.123]	0.160 [0.123]	0.150 [0.120]	0.124 [0.130]
$\chi 2$	162.87	154.60	142.15	162.74	162.09	141.92
Pseudo R^2	0.59	0.59	0.59	0.60	0.59	0.60

All models include 3,139 observations, and include a control for the natural log of county population.
Robust standard errors in brackets.

Table 5: Mean Marginal Effects from Logit Estimates of Madoff Victimization: Non Profit Investors with Distance Interactions

	(7)	(8)	(9)	(10)	(11)
Jewish Organizations	2.38×10^{-5} 1.77×10^{-5}				
Jewish Organizations / Religious Organizations		0.021 [0.018]			
Total Rev. of Jewish Org./ Total Rev. of Religious Org.			0.011 [0.011]		
Religious Organizations		-2.49×10^{-6} $[4.30 \times 10^{-6}]$			
Total Revenue of Religious Org. (100k)			-1.28×10^{-11} $[1.54 \times 10^{-11}]$		
Kosher Restaurants				2.07×10^{-4} $[1.22 \times 10^{-4}]$	
JCC Organizations					0.003 [0.002]
JCC Satellites					-0.001 [0.003]
Geographic distance from Madoff	-0.005 [0.002]	-0.005 [0.002]	-0.003 [0.002]	-0.003 [0.002]	-0.004 [0.002]
Distance x Jewish Organizations	1.42×10^{-7} $[9.53 \times 10^{-8}]$				
Distance x Jewish Organizations / Religious Organizations		0.104 [0.027]			
Distance x Jewish Rev. / Religious Rev.			0.0005 $[1.30 \times 10^{-5}]$		
Distance x Kosher Restaurants				0.0001 $[1.74 \times 10^{-4}]$	
Distance x JCC Organizations					0.001 [0.001]
Ln(Median Income)	-0.006 [0.010]	-0.005 [0.011]	-0.005 [0.010]	-0.003 [0.010]	-0.001 [0.011]
Percent White	0.023 [0.017]	0.018 [0.017]	0.019 [0.017]	0.024 [0.019]	0.023 [0.019]
Percent 65+	-0.034 [0.049]	-0.038 [0.051]	-0.033 [0.055]	-0.035 [0.050]	-0.034 [0.052]
Percent of 65+ with college degree	0.325 [0.164]	0.366 [0.180]	0.360 [0.186]	0.350 [0.162]	0.350 [0.168]
Percent HH with Income 200k+	0.205 [0.124]	0.154 [0.124]	0.204 [0.124]	0.162 [0.125]	0.150 [0.119]
$\chi 2$	172.16	136.61	149.47	166.44	164.13
Pseudo R^2	0.59	0.59	0.60	0.59	0.59

All models include 3,139 observations, and include a control for the natural log of county population.
Robust standard errors in brackets.

Table 6: Mean Partial Elasticities from Negative Binomial Estimates of Madoff Victimization: All Investors

	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Organizations	0.007	0.015	0.008	-.006	0.006	0.007
	[0.009]	[0.020]	[0.011]	[0.009]	[0. 101]	[0.010]
Geographic distance from Madoff	0.003	-0.198	-0.059	-0.083	-0.344	-0.171
	[0.088]	[0.129]	[0.116]	[0.135]	[0.158]	[0.161]
Distance x Jewish Organizations				0.008	0.010	0.008
				[0.007]	[0.011]	[0.011]
Jewish Organizations / Religious Organizations	12.7	25.4	15.4	3.23	8.71	4.35
	[6.20]	[6.60]	[6.73]	[3.15]	[5.11]	[3.57]
Geographic distance from Madoff	0.020	-0.187	-.034	-0.138	-0.343	-0.271
	[0.085]	[0.118]	[0.100]	[0.087]	[0.152]	[0.128]
Distance x Jewish Organizations / Religious Organizations				15.2	4.30	10.9
				[7.08]	[4.93]	[5.15]
Total Rev. of Jewish Org./ Total Rev. of Religious Org	4.77	4.98	5.08	3.19	2.61	3.19
	[1.41]	[1.54]	[1.58]	[1.03]	[0.84]	[1.11]
Geographic distance from Madoff	0.015	-0.198	-0.019	-0.076	-0.273	-0.133
	[0.069]	[0.128]	[0.087]	[0.053]	[0.148]	[0.093]
Distance x Jewish Rev. / Religious Rev.				26.0	1.34	2.80
				[13.7]	[1.63]	[1.52]
Kosher Restaurants	0.039	0.075	0.049	0.034	0.039	0.033
	[0.022]	[0.041]	[0.029]	[0.017]	[0.023]	[0.018]
Geographic distance from Madoff	0.019	-0.120	-0.028	-0.039	-0.280	-0.129
	[0.080]	[0.125]	[0.092]	[0.098]	[0.141]	[0.096]
Distance x Kosher Restaurants				0.014	0.014	0.014
				[0.030]	[0.025]	[0.026]
JCC Organizations	0.239	0.227	0.207	0.366	0.404	0.253
	[0.129]	[0.174]	[0.139]	[0.125]	[0.208]	[0.152]
JCC Satellites	0.167	0.148	0.202	0.511	0.522	0.592
	[0.406]	[0.428]	[0.412]	[0.497]	[0.669]	[0.488]
Geographic distance from Madoff	0.029	-0.171	-0.008	0.129	-0.129	0.138
	[0.085]	[0.127]	[0.099]	[0.094]	[0.125]	[0.149]
Distance x JCC Organizations				-0.136	-0.194	-0.154
				[0.057]	[0.067]	[0.060]
N	308	3,139	3,139	308	3,139	3,139

Additional controls include the log of county population, the percent of residents over 65 with a college degree, the percent of residents who are over 65, the log of median household income, the percent of household earning more than $200k in 2000, and the percent of residents who are white (non-Hispanic). Columns 2, 3, 5 and 6 include the total number of religious organizations(2 and 4) and the total amount of revenue collected by those organizations (3 and 5), as well as the interaction of those measures with distance in columns 5 and 6. Robust standard errors in brackets.

Table 7. Mean Partial Elasticities from Negative Binomial Estimates of Madoff Victimization: Non Profit Investors

	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Organizations	-0.0004	3.05×10^{-4}	-0.0013	-0.0004	-2.4×10^{-5}	-0.0013
	[0.0006]	[0.0007]	[0.0008]	[0.0006]	[0.001]	[0.001]
Geographic distance from Madoff	-0.430	-0.698	-0.749	-0.404	-0.669	-0.686
	[0.116]	[0.189]	[0.213]	[0.117]	[0.192]	[0.196]
Distance x Jewish Organizations				-7.52×10^{-5}	0.0002	0.001
				[0.0003]	[0.0009]	[0.001]
Jewish Organizations / Religious Organizations	3.449	3.96	0.718	6.417	3.953	11.844
	[5.122]	[3.112]	[3.227]	[3.660]	[3.251]	[6.321]
Geographic distance from Madoff	-0.305	-0.594	-0.334	-0.365	-1.000	-0.343
	[0.1285]	[0.183]	[0.301]	[0.218]	[0.272]	[0.382]
Distance x Jewish Organizations / Religious Organizations				-4.01	-10.65	-5.16
				[6.31]	[10.0]	[4.86]
Total Rev. of Jewish Org./ Total Rev. of Religious Org	4.386	2.750	5.811	4.472	3.140	5.935
	[0.989]	[1.475]	[1.311]	[1.107]	[1.689]	[1.437]
Geographic distance from Madoff	-0.1057	-0.584	-0.177	-0.0207	-0.468	-0.226
	[0.110]	[0.168]	[0.138]	[0.122]	[0.187]	[0.244]
Distance x Jewish Rev. / Religious Rev.	-0.0004	0.0003	0.0013	-0.0004	-2.4×10^{-5}	-0.0013
	[0.0006]	[0.0007]	[0.0008]	[0.0006]	[0.001]	[0.001]
Kosher Restaurants	0.010	0.005	0.011	0.011	0.006	0.013
	[0.005]	[0.006]	[0.008]	[0.005]	[0.006]	[0.006]
Geographic distance from Madoff	-0.304	-0.664	-0.514	-0.247	-0.621	-0.300
	[0.108]	[0.201]	[0.319]	[0.116]	[0.205]	[0.168]
Distance x Kosher Restaurants				-0.004	-0.004	-0.004
				[0.001]	[0.001]	[0.001]
JCC Organizations	0.234	0.015	0.197	0.222	-0.019	0.155
	[0.191]	[0.260]	[0.310]	[0.221]	[0.261]	[0.342]
JCC Satellites	-0.178	-0.027	-0.246	0.408	0.697	0.031
	[0.198]	[0.499]	[0.255]	[0.528]	[1.01]	[0.807]
Geographic distance from Madoff	-0.373	-0.693	-0.556	-0.142	-0.569	-0.182
	[0.116]	[0.190]	[0.207]	[0.123]	[0.204]	[0.205]
Distance x JCC Organizations				-0.093	0.004	-0.018
				[0.066]	[0.170]	[0.018]
N	41	3,139	3,139	41	3,139	3,139

Additional controls include the log of county population, the percent of residents over 65 with a college degree, the percent of household earning more than $200k in 2000, the log of median household income and the percent of residents who are white (non-Hispanic) and the percent of residents who are over 65. Columns 2, 3, 5 and 6 include the total number of religious organizations (2 and 4) and the total amount of revenue collected by those organizations (3 and 5), as well as the interaction of those measures with distance in columns 5 and 6. Robust standard errors in brackets.

Table 8: Mean Marginal Effects from Logit Estimates of Madoff Victimization: All Investors

	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Organizations	0.009 [0.003]					1.98×10^{-4} [0.003]
Jewish Organizations / Religious Organizations		0.882 [0.184]				0.633 [0.229]
Total Rev. of Jewish Org. / Total Rev. of Religious Org.			0.134 [0.041]			0.064 [0.041]
Religious Organizations		-3.96×10^{-5} [3.62×10^{-5}]				-2.57×10^{-5} [3.93×10^{-5}]
Total Revenue of Religious Org. (100k)			9.60×10^{-12} [1.24×10^{-10}]			2.23×10^{-11} [1.42×10^{-10}]
Kosher Restaurants				0.025 [0.007]		0.019 [0.007]
JCC Organizations					0.050 [0.016]	0.025 [0.017]
JCC Satellites					-0.015 [0.040]	-0.038 [0.047]
Geographic distance from Madoff	-0.020 [0.005]	-0.018 [0.005]	-0.020 [0.005]	-0.016 [0.005]	-0.019 [0.005]	-0.014 [0.005]
Ln(Median Income)	0.086 [0.022]	0.089 [0.022]	0.097 [0.022]	0.091 [0.022]	0.097 [0.023]	.084 [0.022]
Percent White	0.106 [0.050]	0.086 [0.051]	0.113 [0.051]	0.114 [0.051]	0.117 [0.053]	0.099 [0.053]
Percent 65+	-0.165 [0.133]	-0.052 [0.132]	-0.142 [0.136]	-0.169 [0.138]	-0.143 [0.138]	-0.118 [0.134]
Percent of 65+ with college degree	2.699 [0.416]	2.330 [0.413]	2.752 [0.406]	2.804 [0.402]	2.812 [0.410]	2.387 [0.407]
Number of Doctors	1.43×10^{-5} [1.08×10^{-5}]	3.37×10^{-5} [1.11×10^{-5}]	3.21×10^{-5} [1.14×10^{-5}]	1.55×10^{-5} [1.34×10^{-5}]	2.18×10^{-5} [1.15×10^{-5}]	1.41×10^{-5} [1.31×10^{-5}]
χ^2	357.36	384.37	393.99	404.15	409.40	408.53
Pseudo R^2	0.51	0.52	0.51	0.52	0.51	0.53

All models include 3,139 observations, and include a control for the natural log of county population.
Robust standard errors in brackets.

Table 9: Mean Marginal Effects from Logit Estimates of Madoff Victimization: All Investors with Distance Interactions

	(7)	(8)	(9)	(10)	(11)
Jewish Organizations	0.019 [0.005]				
Jewish Organizations / Religious Organizations		0.807 [0.272]			
Total Rev. of Jewish Org./ Total Rev. of Religious Org.			0.153 [0.066]		
Religious Organizations		4.03×10^{-5} [3.62×10^{-5}]			
Total Revenue of Religious Org. (100k)			7.42×10^{-12} [1.24×10^{-10}]		
Kosher Restaurants				0.024 [0.007]	
JCC Organizations					0.058 [0.023]
JCC Satellites					-0.018 [0.040]
Geographic distance from Madoff	-0.011 [0.006]	-0.019 [0.005]	-0.020 [0.005]	-0.017 [0.005]	-0.019 [0.005]
Distance x Jewish Organizations	-0.005 [-0.001]				
Distance x Jewish Organizations / Religious Organizations		-0.043 [0.139]			
Distance x Jewish Rev. / Religious Rev.			-0.035 [0.060]		
Distance x Kosher Restaurants				0.003 [0.006]	
Distance x JCC Organizations					-0.007 [0.011]
Ln(Median Income)	0.086 [0.022]	0.089 [0.051]	0.098 [0.022]	0.090 [0.022]	0.098 [0.023]
Percent White	0.106 [0.054]	0.086 [0.051]	0.114 [0.051]	0.119 [0.051]	0.117 [0.137]
Percent 65+	-0.156 [0.130]	-0.047 [0.133]	-0.143 [0.136]	-0.176 [0.139]	-0.146 [0.137]
Percent of 65+ with college degree	2.550 [0.391]	2.335 [0.410]	2.744 [0.405]	2.826 [0.408]	2.822 [0.411]
Number of Doctors	1.65×10^{-5} [1.02×10^{-5}]	3.38×10^{-5} [1.11×10^{-5}]	3.26×10^{-5} [1.13×10^{-5}]	1.45×10^{-5} [1.41×10^{-5}]	2.22×10^{-5} [1.12×10^{-5}]
χ^2	185.84	151.28	196.08	186.84	190.23
Pseudo R^2	0.60	0.63	0.61	0.60	0.60

All models include 3,139 observations, and include a control for the natural log of county population.
Robust standard errors in brackets.

Table 10: Mean Marginal Effects from Logit Estimates of Madoff Victimization: Non Profit Investors

	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Organizations	2.21×10^{-5} $[1.86 \times 10^{-5}]$					5.15×10^{-5} $[1.16 \times 10^{-4}]$
Jewish Organizations / Religious Organizations		0.041 [0.020]				-0.014 [0.060]
Total Rev. of Jewish Org. / Total Rev. of Religious Org.			0.006 [0.009]			-0.009 [0.013]
Religious Organizations		-8.65×10^{-6} $[4.04 \times 10^{-6}]$				-1.76×10^{-5} $[5.35 \times 10^{-6}]$
Total Revenue of Religious Org. (100k)			-4.00×10^{-11} $[3.51 \times 10^{-11}]$			-1.09×10^{-11} $[2.11 \times 10^{-11}]$
Kosher Restaurants				1.82×10^{-4} $[1.40 \times 10^{-4}]$		2.09×10^{-4} $[1.87 \times 10^{-4}]$
JCC Organizations					0.003 [0.002]	0.001 [0.003]
JCC Satellites					-0.004 [0.003]	-0.002 [0.003]
Geographic distance from Madoff	-0.003 [0.002]	-0.003 [0.001]	-0.003 [0.002]	-0.003 [0.002]	-0.003 [0.002]	-0.002 [0.001]
Ln(Median Income)	-0.010 [0.008]	-0.003 [0.008]	-0.009 [0.008]	0.009 [0.008]	0.010 [0.007]	-0.002 [0.003]
Percent White	0.018 [0.019]	0.013 [0.017]	0.016 [0.019]	0.020 [0.020]	0.018 [0.019]	0.017 [0.018]
Percent 65+	-0.030 [0.051]	-0.052 [0.052]	-0.040 [0.052]	-0.037 [0.050]	-0.029 [0.052]	-0.054 [0.052]
Percent of 65+ with college degree	0.396 [0.158]	0.443 [0.167]	0.417 [0.163]	0.037 [0.050]	0.386 [0.156]	0.441 [0.159]
Number of Doctors	1.86×10^{-6} $[9.33 \times 10^{-7}]$	2.88×10^{-6} $[8.63 \times 10^{-7}]$	2.44×10^{-6} $[8.44 \times 10^{-7}]$	1.50×10^{-6} $[1.10 \times 10^{-6}]$	1.75×10^{-6} $[1.13 \times 10^{-6}]$	3.58×10^{-6} $[1.07 \times 10^{-6}]$
$\chi 2$	189.48	170.66	186.74	184.06	187.61	160.39
Pseudo R^2	0.61	0.62	0.60	0.60	0.63	0.61

All models include 3,139 observations, and include a control for the natural log of county population.
Robust standard errors in brackets.

Table 11: Mean Marginal Effects from Logit Estimates of Madoff Victimization: Non Profit Investors with Distance Interactions

	(7)	(8)	(9)	(10)	(11)
Jewish Organizations	2.03×10^{-5} 1.53×10^{-5}				
Jewish Organizations / Religious Organizations		0.030 [0.019]			
Total Rev. of Jewish Org./ Total Rev. of Religious Org.			0.007 [0.011]		
Religious Organizations		-7.47×10^{-6} $[4.32 \times 10^{-6}]$			
Total Revenue of Religious Org. (100k)			-4.04×10^{-11} $[3.54 \times 10^{-11}]$		
Kosher Restaurants				1.80×10^{-4} $[1.39 \times 10^{-4}]$	
JCC Organizations					0.003 [0.002]
JCC Satellites					-0.004 [0.002]
Geographic distance from Madoff	-0.004 [0.002]	-0.005 [0.002]	-0.003 [0.002]	-0.003 [0.002]	-0.003 [0.002]
Distance x Jewish Organizations	6.99×10^{-5} $[1.19 \times 10^{-5}]$				
Distance x Jewish Organizations / Religious Organizations		0.087 [0.027]			
Distance x Jewish Rev. / Religious Rev.			-0.002 [0.013]		
Distance x Kosher Restaurants				2.67×10^{-5} $[2.00 \times 10^{-4}]$	
Distance x JCC Organizations					-6.29×10^{-4} [0.001]
Ln(Median Income)	-0.009 [0.007]	-0.003 [0.008]	-0.010 [0.007]	-0.009 [0.008]	-0.010 [0.008]
Percent White	0.019 [0.019]	0.015 [0.017]	0.016 [0.019]	0.020 [0.020]	0.018 [0.019]
Percent 65+	-0.035 [0.050]	-0.050 [0.050]	-0.040 [0.052]	-0.037 [0.049]	-0.028 [0.051]
Percent of 65+ with college degree	0.399 [0.156]	0.422 [0.161]	0.417 [0.162]	0.407 [0.154]	0.388 [0.156]
Number of Doctors	1.53×10^{-6} $[1.09 \times 10^{-6}]$	2.42×10^{-6} $[8.89 \times 10^{-7}]$	2.45×10^{-6} $[8.45 \times 10^{-7}]$	1.46×10^{-6} $[1.18 \times 10^{-6}]$	1.84×10^{-6} $[1.14 \times 10^{-6}]$
$\chi 2$	184.88	156.24	192.95	184.30	189.99
Pseudo R^2	0.59	0.61	0.60	0.60	0.60

All models include 3,139 observations, and include a control for the natural log of county population.
Robust standard errors in brackets.

Table 12: Mean Partial Elasticities from Negative Binomial Estimates of Madoff Victimization: All Investors

	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Organizations	0.003 [0.006]	0.006 [0.012]	-0.0004 [0.0005]	-.0025 [0.0052]	0.003 [0. 006]	0.002 [0.006]
Geographic distance from Madoff	0.006 [0.088]	-0.164 [0.136]	-0.452 [0.158]	-0.057 [0.134]	-0.266 [0.147]	-0.177 [0.186]
Distance x Jewish Organizations				0.006 [0.015]	0.010 [0.010]	0.008 [0.012]
Jewish Organizations / Religious Organizations	12.5 [6.00]	24.1 [5.60]	14.7 [6.21]	1.96 [1.78]	7.23 [4.23]	3.33 [2.47]
Geographic distance from Madoff	0.037 [0.076]	-0.150 [0.118]	-.032 [0.097]	-0.085 [0.080]	-0.269 [0.146]	-0.233 [0.111]
Distance x Jewish Organizations / Religious Organizations				12.0 [4.20]	6.33 [4.31]	8.23 [4.24]
Total Rev. of Jewish Org./ Total Rev. of Religious Org	4.25 [1.55]	3.69 [1.04]	5.38 [1.19]	2.85 [1.21]	2.10 [0.685]	2.80 [1.23]
Geographic distance from Madoff	0.017 [0.070]	-0.166 [0.133]	-0.278 [0.229]	-0.052 [0.054]	-0.205 [0.142]	-0.130 [0.086]
Distance x Jewish Rev. / Religious Rev.				1.20 [3.10]	1.39 [1.46]	1.87 [1.48]
Kosher Restaurants	0.040 [0.024]	0.070 [0.038]	0.005 [0.005]	0.035 [0.021]	0.045 [0.027]	0.039 [0.023]
Geographic distance from Madoff	0.029 [0.079]	-0.155 [0.127]	-0.403 [0.168]	-0.019 [0.098]	-0.217 [0.135]	-0.076 [0.023]
Distance x Kosher Restaurants				0.012 [0.031]	0.012 [0.025]	0.012 [0.023]
JCC Organizations	0.241 [0.160]	0.342 [0.243]	0.041 [0.247]	0.378 [0.158]	0.599 [0.261]	0.343 [0.180]
JCC Satellites	-0.105 [0.420]	-0.535 [0.312]	-0.181 [0.258]	0.005 [0.452]	-0.643 [0.351]	-0.070 [0.446]
Geographic distance from Madoff	0.030 [0.081]	-0.148 [0.136]	-0.495 [0.168]	0.247 [0.109]	-0.078 [0.127]	0.287 [0.145]
Distance x JCC Organizations				-0.522 [0.189]	-0.457 [0.150]	-0.509 [0.167]
N	308	3,139	3,139	308	3,139	3,139

Additional controls include the log of county population, the percent of residents over 65 with a college degree, the percent of residents who are over 65, the log of median household income, the number of doctors, and the percent of residents who are white (non-Hispanic). Columns 2, 3, 5 and 6 include the total number of religious organizations (2 and 4) and the total amount of revenue collected by those organizations (3 and 5), as well as the interaction of those measures with distance in columns 5 and 6. Robust standard errors in brackets.

Table 13. Mean Partial Elasticities from Negative Binomial Estimates of Madoff Victimization: Non Profit Investors

	(1)	(2)	(3)	(4)	(5)	(6)
Jewish Organizations	-0.0003	0.0005	-0.0004	-0.0003	-0.0005	-0.004
	[0.0004]	[0.0005]	[0.0005]	[0.0004]	[0.0004]	[0.0005]
Geographic distance from Madoff	-0.361	-0.626	-0.436	-0.189	-0.517	-0.294
	[0.118]	[0.184]	[0.159]	[0.123]	[0.177]	[0.227]
Distance x Jewish Organizations				-0.001	-0.0009	-0.001
				[0.0001]	[0.002]	[0.001]
Jewish Organizations / Religious Organizations	3.01	4.46	4.52	3.94	2.45	-3.30
	[2.12]	[2.76]	[2.45]	[3.33]	[2.99]	[3.60]
Geographic distance from Madoff	-0.140	-0.476	-0.309	-0.160	-0.758	-0.189
	[0.108]	[0.170]	[0.484]	[0.204]	[0.239]	[0.325]
Distance x Jewish Organizations / Religious Organizations				-1.22	-2.91	-1.68
				[4.55]	[7.06]	[10.6]
Total Rev. of Jewish Org./ Total Rev. of Religious Org	3.98	1.96	5.38	4.292	2.43	5.33
	[0.973]	[1.29]	[1.18]	[1. 076]	[1.46]	[1.51]
Geographic distance from Madoff	-0.107	-0.561	-0.278	-0.061	-0.409	-0.170
	[0.117]	[0.174]	[0.229]	[0.141]	[0.197]	[0.501]
Distance x Jewish Rev. / Religious Rev.				-0.0005	0.0002	-0.003
				[0.001]	[0.002]	[0.008]
Kosher Restaurants	0.007	-0.0003	0.005	0.007	-0.0004	0.006
	[0.005]	[0.007]	[0.005]	[0.005]	[0.006]	[0.186]
Geographic distance from Madoff	-0.281	-0.621	-0.403	-0.163	-0.531	-0.300
	[0.115]	[0.187]	[0.168]	[0.112]	[0.179]	[0.168]
Distance x Kosher Restaurants				-0.003	-0.001	-0.006
				[0.001]	[0.006]	[0.004]
JCC Organizations	0.158	0.005	0.041	0.147	-0.028	0.126
	[0.162]	[0.236]	[0.247]	[0.135]	[0.120]	[0.209]
JCC Satellites	-0.174	-0.199	-0.181	0.341	0.310	-0.023
	[0.176]	[0.460]	[0.258]	[0.346]	[0.502]	[0.450]
Geographic distance from Madoff	-0.327	-0.641	-0.495	-0.148	-0.407	0.118
	[0.126]	[0.195]	[0.167]	[0.130]	[0.184]	[0.296]
Distance x JCC Organizations				-0.210	-0.084	-0.342
				[0.070]	[0.140]	[0.004]
N	41	3,139	3,139	41	3,139	3,139

Additional controls include the log of county population, the percent of residents over 65 with a college degree, the number of doctors, and the log of median household income, the percent of residents who are white (non-Hispanic) and the percent of residents who are over 65. Columns 2, 3, 5 and 6 include the total number of religious organizations (2 and 4) and the total amount of revenue collected by those organizations (3 and 5), as well as the interaction of those measures with distance in columns 5 and 6. Robust standard errors in brackets.