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ABSTRACT

The Economics of Mass Shootings*

We perform an empirical investigation of the socioeconomic determinants and consequences of all mass shootings in the U.S. from 2000 to 2015. We first manually search for and collect information on perpetrators. We find that approximately 40% (45%) of shooters were in financial distress (unemployed or out of the labor force) at the moment of the shooting, suggesting that economic distress may trigger rise in shooting. We then investigate the economic consequences of mass shootings. In order to obtain the causal effects of shootings, we exploit the inherent randomness in the success or failure of mass shootings. We find that, on average, successful mass shooting have economically significant negative effects on targeted counties' employment and earnings. As well, successful mass shootings decrease housing prices and consumer confidence and increase absenteeism. Last, we employ an instrumental variable strategy and show that national media coverage of mass shootings exacerbate their local economic consequences.

JEL Classification: D74, C13, P16

Keywords: mass shootings, employment, consumer confidence, absenteeism, media coverage

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There has been a long tradition among economists to try to understand the economic implications of conflict and war.[1] In comparison to external wars, internal conflict and terrorism, however, mass shootings have received much less attention in the economic literature. But the increasing number of mass shootings has refocused efforts towards a better understanding of mass shootings and its economic causes and consequences. From 2000 to 2015, there has been approximately 175 mass shootings in the U.S. leading to more than 900 fatalities and thousands of injured people (Figure 1).[2]

The objective of this paper is to make progress towards the examination of the economic determinants and consequences of mass shootings. While a growing literature analyzes the consequences of mass shootings, mostly focusing on the effects on mental health (e.g., Lowe and Galea (2017)), electoral outcomes (e.g., Yousaf (2019)), student performance (e.g., Beland and Kim (2016)), and gun laws (e.g., Donohue et al. (2019) and Luca et al. (2019)), there are few empirical analyzes of the economics of mass shootings.[3] This is unfortunate because anecdotal evidence suggests long-lasting consequences for towns targeted by mass shooters (e.g., Rowhani-Rahbar et al. (2019)). Furthermore, several qualitative studies point out that for many perpetrators, who are already in a fragile emotional state, a termination of employment is the last straw (e.g., Meloy et al. (2001)). We fill this gap by documenting the socioeconomic characteristics of the perpetrators and providing causal effect of the economic consequences of mass shootings.

We first investigate whether unemployment and financial distress might trigger mass shooting. Specifically, we attempt to track down the socioeconomic backgrounds of individuals involved in mass shootings over the period 2000–2015. To be considered a mass shooting, the shooting incident needs to lead to four or more people killed (see Section 1 for the exact definition). We compile the list of mass shootings using three main data sources. We then rely on automated and manual data collection strategies to collect the following socioeconomic characteristics of perpetrators at the time of the shooting: age, education, employment status, history of mental illness, marital status, nationality, place of residence and race. We also col-

[1]See, for instance, the seminal work of Mill (1848), Keynes (1919) and Becker (1968).

[2]The first documented school mass shooting in the U.S. occurred in 1764. Appendix Figure A1 shows the number of casualties and injured people caused by school shootings in the U.S. from 1764 to 2017.

[3]One exception is Pah et al. (2017). In a letter published in *Nature Human Behavior*, the authors argue that school shootings are related to the unemployment rate. In a correspondence to the editors, Pappa et al. (2019) re-investigate this relationship and conclude that the positive relationship was likely due to omitted variables.

lect information on risk factors (e.g., financial distress or social rejection). We compare these individuals to American men aged 20–50.

We find that perpetrators in our sample are 34 years old on average and 95% of shooters are men. The perpetrators are less likely to have graduated high school than men in our comparison group. About 40% of perpetrators had a (known) history of mental illness (or mental disorder) and 15% served or were serving in the military. We find that approximately 40% of shooters were in financial distress and that 45% were unemployed or out of the labor force at the moment of the shooting, suggesting that economic distress may trigger rise in mass shooting. These figures decrease to 18% and 25% for school-related shootings, respectively. In contrast, about 70% of perpetrators were in financial distress for workplace-related shootings. Our findings are consistent with anecdotal evidence that many perpetrators who target workplaces were fired (or about to be fired) in the days prior to the shooting. We provide policy recommendations in the conclusion.

We then turn to documenting the economic consequences of mass shootings. Identifying the economic consequences of mass shootings is difficult since the vast majority of mass shooters were living in the county or metropolitan area where they committed the shooting and that the local economic environment may have triggered some individuals into committing the shooting. We address this endogeneity issue by exploiting the inherent randomness in the success or failure of mass shootings (Brodeur (2018); Jones and Olken (2009)). In our analysis, we directly compare employment and earnings for two sets of counties: (i) counties hit by a successful mass shooting and (ii) counties hit by a failed mass shooting. This identification strategy is appealing since counties targeted by successful and failed mass shootings have similar employment rates and total earnings prior to the shooting and are balanced across a wide range of socioeconomic characteristics (Section 3.2).

We find that successful mass shootings in comparison to failed mass shootings reduce the number of jobs and establishments in targeted counties by about 1.8% and 1.3%, respectively. Similarly, we find that successful mass shootings significantly decrease total earnings and earnings per job. The estimated effects persist for several years after the shooting. In contrast, we do not find any evidence that failed mass shootings significantly affect local economies. These findings are consistent with the fact that successful and failed mass shootings differ in two key dimensions. First, successful shootings lead to significantly more casualties than failed shootings. Second, we show that successful shootings receive significantly more national media coverage than failed shootings. In other words, successful shootings are more salient than failed shootings, which may explain the lack of meaningful economic loss for counties hit by a failed shooting.

We then turn to understanding the channels through which successful mass shootings might affect local economies. We find that the economic consequences of successful mass shootings are larger for manufacturing and goods-producing firms and smaller for the service industries. Of note, though, we do find a significant reduction of employment in the leisure and hospitality industry, suggesting a negative effect on the tourism industry. Further, we find that the effect of a decrease in the number of firms is mainly driven by a reduction in the number of small establishments (less than 100 workers). We also find that housing prices decrease by approximately 3% in the years following a successful mass shooting.

We further explore several mechanisms that may explain the effect of successful mass shootings on local economies. Using the Michigan Survey of Consumers, we analyze the effect of successful mass shootings on consumer sentiment. Consumer sentiment is an important predictor of future consumer expenditure and business conditions (Aladangady et al. (2016); Ludvigson (2004)). We find that successful mass shootings lead to a pessimistic view of respondents' own personal financial conditions and local business conditions. Specifically, consumers in counties with successful mass shootings are 5.2% more likely to say that their personal finances are worse now than before the shooting and 4.9% more likely to say that the local business conditions are worse now than before the shooting. Furthermore, we rely on self-reported health data from the Behavioral Risk Factor Surveillance System and show that residents of targeted areas are more likely to report being unable to do their usual activities such as working because of poor health. These results provide suggestive evidence that successful mass shootings may impact local businesses and jobs by increasing absenteeism and possibly decreasing productivity through poor mental health.

Finally, we explore whether the possibility that media coverage of these shootings might exacerbate the economic impacts of successful mass shootings (DellaVigna and La Ferrara (2015)). Following Eisensee and Stromberg (2007), we study how news pressure from other events impacts media coverage of mass shootings and their subsequent impact on economic outcomes. Specifically, we explore how the lack of media attention on mass shootings due to natural disasters in the U.S. on the day of the shooting affects our estimates on employment and earnings. Using Vanderbilt Television News Archive, we measure media coverage of successful mass shootings as the number of news stories and total duration of news stories dedicated to the shootings on the networks ABC, CBS and NBC. We first show that mass shootings occurring during a natural disaster receive significantly lower media coverage in the national media. We then show that mass shootings that receive greater media attention lead to a greater reduction in targeted counties' employment and earnings. Our estimates suggest that one additional news story about the mass shooting in the national media leads to a 0.3% decrease in the counties' employment. Successful mass shootings in our sample, excluding the biggest mass shooting, received on average 3.7 news stories. These findings suggest that the average number of news stories on national media of mass shootings leads to a 1.1% decrease in the employment per capita.

Our paper is directly related to a literature on the economic causes of hate crime, terrorism and violent crime (Dustmann et al. (2011); Esteban et al. (2015); Falk et al. (2011); Fryer and Levitt (2012); Krueger and Pischke (1997); Levitt and Venkatesh (2000); Lin (2008)).[4] The existing literature has documented both positive and negative relationships between economic conditions and violent crime (Box (1987)). To our knowledge, we are the first to systematically document the socioeconomic characteristics and economic motivations of a large number of mass shooters.[5]

We also relate to a growing literature on the relationship between violence and media (Adena et al. (2015); Dahl and DellaVigna (2009); Durante and Zhuravskaya (2018); Jetter (2017); Yanagizawa-Drott (2014)). Jetter and Walker (2018) empirically analyze the relationship between media and mass shootings. The authors provide evidence that media coverage of mass shootings on ABC World News Tonight (2013–2016) encourages future mass shootings. We contribute to this literature by showing that national media coverage of tragedies such as mass shootings may exacerbate their negative effects on the economy.

Finally, we contribute to the literature on the impact of uncertainty

[4]In a series of studies, Alan B. Krueger provides empirical evidence that terrorists have a relatively high level of education and tend to be from economically advantaged families (Krueger (2008a); Krueger (2008b); Krueger and Malečková (2003)). See Altunbas and Thornton (2011) for the socioeconomic characteristics of homegrown Islamic terrorists in the United Kingdom. See also Glaeser (2005) for a model of the supply of hate-creating stories from politicians and the willingness of voters to accept these stories.

[5]A small literature in various disciplines finds little evidence that local area characteristics are related to the likelihood of mass shootings. See Muschert (2007) for a literature review and Duwe (2014) for a history of mass shootings in the U.S.

shocks on the household behavior and expectations about the economy (Barsky and Sims (2012); Giavazzi and McMahon (2012); Luttmer and Samwick (2018)). We contribute to this literature by overcoming the identification problem in estimating the impact of uncertainty shocks on consumer sentiment.

The remainder of this paper is structured as follows. In Section 1, we detail the data sets and provide summary statistics. Section 2 documents the socioeconomic characteristics of the perpetrators. Section 3 describes the identification strategy, and Section 4 reports the baseline econometric evidence and the sensitivity analysis, respectively. Section 5 documents the channels through which mass shootings affect local economics. The last section concludes and presents policy implications.

1 Data Sets

Our analysis combines economic outcomes from the U.S. Census Bureau with variation at the county level from data sets that we assembled and enriched on mass shootings. We first present the data on mass shootings and then data on economic variables. We then describe data sources employed to study the mechanisms driving the economic factors.

1.1 Mass Shootings

Throughout the paper, we use the FBI definition of a mass shooting, i.e., four or more people excluding the perpetrator(s) killed in a shooting incident (Krouse and Richardson (2015)). We compile the list of mass shootings using two data sources. Our main data source is the Supplementary Homicide Reports (SHR) provided by the Federal Bureau of Investigation (2018). The SHR are detailed incident-based reports after each homicide. The data is provided on a monthly basis by each local enforcement agency. The data contains information on the location of the homicide, the number of people killed and injured, the weapon used, and the probable motive(s) for the reported homicide. We use these reports to extract mass shootings incidents as: (i) homicide events in which four or more people were killed, (ii) the weapon used for the homicide was a type of gun, and (iii) the probable motive for the homicide was unclear.[6] Since the exact date of the event is not reported in the data, we manually search for local media coverage in the city where the mass shooting took place in the month of the event to obtain the exact date of these shootings.

[6] This excludes gang-related shootings from our sample.

Second, we complement the FBI SHR data set with the list of mass shootings compiled by the USA Today (2019). USA Today analyzed local news reports and unreported local courts and law enforcement agencies documents to compile a list of mass shootings that were not reported in the FBI SHR. This data contains information on the exact date and location of the shooting, the number of victims, and the type of shooting (school, public, family, etc.). Finally, we rely on the Stanford Mass Shootings in America (2019) for detailed information on the shooter and shooting characteristics. This database collects information on mass shootings using Online resources, and thus only contains information for shootings that were reported in the Online media. In addition to the date and location of shooting, the Stanford MSA contains information on the name, age, sex, mental health status, and race of the shooter. Further, it contains information on the number and type of gun used for the shooting, fate of the shooter, and the type of mass shooting. Collectively, we refer to these mass shootings as "successful" mass shootings. We provide examples of successful mass shootings in the Appendix (Section 7).

Table 1 provides summary statistics. Overall, there were 178 successful mass shootings from 2000 to 2015 occurring in 136 counties. Figure 1 plots the number of successful mass shootings from 2000 to 2015. Successful mass shootings lead to 5.3 deaths on average (std. dev. of 3.2). The two deadliest mass shootings in our sample are the Virginia Tech shooting and the Sandy Hook Elementary School shooting, which led to 32 and 27 casualties, respectively. Well-known workplace shootings in our sample are the Hartford Distributors shooting (eight deaths) and the Wakefield Massacre (seven deaths).

To understand the determinants of mass shootings, we collect socioeconomic characteristics of the shooters. We manually search for and collect information on the perpetrators' demographic characteristics for mass shootings not recorded in the Stanford MSA. In addition, we manually collect information on the socioeconomic characteristics of the shooter. We provide more information on the data collection and results in Section 2.

We also collect information on weapon types used. In our sample, handguns such as pistols and revolvers are used about 60% of the time. Rifles, shotguns and other guns are used 9%, 8% and 3% of the time, respectively. We do not have information on the gun used in approximately 20% of shootings.

To estimate the causal impact of mass shootings on the economic outcomes, we need a credible control group. We cannot simply characterize the homicides with less than four deaths as our control group as the FBI SHR only records completed homicides. Hence, these shootings do not provide a valid counter-factual to successful mass shootings as the shooter may only intend to kill less than four individuals. To construct our control group, we utilize the FBI Active Shooter Incidents reports (Federal Bureau of Investigation (2019)). The FBI defines an incident as active shooting if "an individual is actively engaged in killing or attempting to kill people in populated area." These incidents provide a valid counter-factual because the shooter opens fire in a public place with an intention to kill indiscriminately.[7][8] These reports contain a brief description of each incident outlining the precise date and location of the event, name, age and sex of the shooter, weapon used for the shooting, and the type of shooting. We use these reports to characterize active shooting incidents with less than four deaths as "failed" mass shootings. We provide examples of failed mass shootings in the Appendix (Section 7).

Altogether, there are 114 failed mass shootings in 95 counties from 2000 to 2015 (Table 1). Appendix Figure A2 plots the number of failed mass shootings from 2000 to 2015, while Appendix Figure A3 plots the share of successful and failed mass shootings in each year. We manually coded how failed mass shootings ended. We categorized failed mass shootings into four categories: (1) law enforcement intervention, (2) citizen(s) restrained or subdued the perpetrator, (3) suicide before law enforcement arrived, and (4) the perpetrator fled the scene before law enforcement arrived. Approximately 34% of failed mass shootings ended with a suicide before law enforcement arrived. 15% of failed mass shootings ended because a citizen(s) subdued the perpetrator until law enforcement arrived. 15% of failed mass shootings ended because the perpetrator fled the scene. Last, about 36% of mass shootings failed because of law enforcement intervention. Of note, it is unclear whether the perpetrator would have killed more individuals without law enforcement intervention. In a set of robustness checks, we show that excluding failed mass shootings that ended because of law enforcement arrival (or any of these four categories) from the comparison group does

[7] Out of the 153 active shooter incidents from 2000 to 2015, 39 (25%) of them ended up being a successful mass shooting (Table 1).

[8] One concern is that failed mass shootings may be better controls for successful mass shootings recorded in the FBI active shooter incidents rather than for all successful mass shootings. Using only this subset of successful shootings leave us with 39 successful mass shootings occurring in 34 counties. Our estimates for employment, earnings and business establishments are similar in magnitude to the ones obtained using all successful shootings, although less precisely estimates due to the small number of incidents. Results available upon request.

not alter our main conclusions.

We provide empirical evidence that successful and failed mass shootings differ in few key dimensions. A first major difference is the number of casualties. By construction, failed mass shootings cannot lead to more than 3 casualties, whereas successful shootings lead to at least four casualties. In our sample, failed mass shootings lead to 1.3 casualties on average (std. dev. of 1.1). Second, we show that successful mass shootings receive more national media coverage than failed shootings (Section 5). This is partly due to the fact that failed shootings lead to relatively less casualties, i.e., the number of casualties is positively related to the extent of national media coverage. Overall, we find that successful shootings are more salient than failed shootings. We provide empirical evidence that the success of a mass shooting is plausibly random in Section 3.

1.2 Employment, Earnings and Housing Data

Employment Our primary data source for the economic outcomes is the County Business Patterns (CBP), an annual series maintained by the U.S. Census Bureau (United States Census Bureau (2019)). This data set contains county level information on employment during the week of March 12, the number of establishments and annual payroll. CBP covers the vast majority of NAICS industries, but excludes establishments reporting rail transportation, public administration private households, government employees and few additional industries. Data for single-establishment companies are retrieved from different Census Bureau surveys, while data for multi-establishment enterprises comes from the Company Organization Survey.

We also rely on data from the Quarterly Census of Employment and Wages (QCEW) provided by the Bureau of Labor Statistics (2019). The QCEW program provides county level employment and wages data of establishments which report to the Unemployment Insurance (UI) programs. The data reported by employers thus cover more than 95 percent of civilian jobs. Jobs not covered by the QCEW (excluded from UI coverage) include self-employed workers, most agricultural workers on small farms, military personnel, elected officials in most states, rail transportation workers and few additional industries. In addition to employment and earnings data, the QCEW reports employment and earnings by private and government jobs, and by different industries.

Both the CBP and QCEW measure the number of jobs in a county on a place of work basis. Our empirical analysis thus investigates the effect of mass shootings on employment in targeted counties, rather than on the place of residence of workers.

Federal Housing Finance Agency We use data from the Federal Housing Finance Agency (FHFA) to measure housing price at the county level. FHFA creates single-family housing price indices by county since 1975. The indices are built by using repeat-sales and refinancings for houses whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac (Bogin et al. (2019)).

1.3 Consumer Confidence

We rely on data from the Michigan Survey of Consumers (MSC) to measure consumer confidence. The MSC is a nationally representative monthly telephone survey of at least 500 consumers whose main objective is to measure temporal fluctuations in consumer confidence. The MSC is used to build the well-known Index of Consumer Sentiment (ICS) using questions such as "We are interested in how people are getting along financially these days. Would you say that you (and your family living there) are better off or worse off financially than you were a year ago?" and "Now turning to business conditions in the country as a whole–do you think that during the next 12 months we'll have good times financially, or bad times, or what?". The ICS is reported regularly in the media (Dominitz and Manski (2004)).

We purchased county level identifiers for the time period 2000–2012. This allows us to match our mass shootings data to the MSC. In our analysis, we do not rely on the ICS, which aggregates responses to the main questions, as the questions offer ordinal response categories. Instead, we follow Dominitz and Manski (2004) and examine time variation in responses to each question separately.

1.4 Health and Work

We also rely on data from the Behavioral Risk Factor Surveillance System (BRFSS). The BRFSS is a telephone survey coordinated by state health departments in collaboration with the Centers for Disease Control and Prevention (CDC). The data is representative of each state's non institutionalized adults population. More information on this survey is available on the CDC's website (http://www.cdc.gov/brfss). The BRFSS covers about two-thirds of U.S. counties excluding those with fewer than 10,000 residents.

This survey provides socioeconomic information on respondents and answers to many health-related questions. Information on county of residence is available until 2012. We rely on the following question to measure the effect of mass shootings on absenteeism: "During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?" We exclude respondents who are more than 65 years old and respondents who report being disabled, homemaker, retired or student from the analysis.

1.5 Media

We collect data on the media coverage of the mass shootings from the Vanderbilt Television News Archive. We perform an exhaustive manual search for the list of mass shootings. We read the detailed description of each news story pertaining to a city on weeks around the mass shooting to measure the news coverage of the shootings. For each mass shooting, we construct whether the shooting was covered in the news, the number of different news stories that covered the shooting, and the number of minutes dedicated to the shooting. Following DellaVigna and La Ferrara (2010), we also count the number of minutes of coverage and number of news stories related to the city (excluding those related to the shooting) in which the shooting took place in that year to account for scale effects.

To establish causal impact of media coverage on the economic outcomes, we collect data on the natural disasters in the United States as a measure of news pressure. Following Eisensee and Stromberg (2007), we collect data on natural disasters in the United States from the Emergency Disaster Database (EM-DAT) as provided by the Centre for Research on the Epidemiology of Disasters (CRED). The data contains information on the starting and ending date of the disaster, the location of the disaster, along with the disaster type. We restrict our attention to the natural disasters that took place during our sample period i.e., from 2000 to 2015. This leaves us with 310 natural disasters, out of which 72% are storms, 26% are floods, and 2% are earthquakes. On average, a natural disaster leads to 18 deaths, affects more than 68,000 individuals, and leads to an estimated economic loss of more than $1.6 million. Overall, there are 20 mass shootings that take place during a natural disaster.

2 Socioeconomic Characteristics of Perpetrators

2.1 Data Collection

In this section, we document the socioeconomic characteristics of the perpetrators. Data were assembled from several sources. We relied on automated and manual data collection strategies. First, we identified the names of perpetrators in the mass shooting data sets. These sources were supplemented with information from different media outlets. Second, for each perpetrator, we isolated an initial pool of potentially relevant newspapers articles, Google searches, legal documents and other unclassified sources. Third, we manually reviewed the media articles and collect the following socioeconomic characteristics at the time of the shooting: age, education, employment status, history of mental illness, marital status, nationality, place of residence and race. We also collect information on risk factors such as financial distress and social rejection. We then called local newspapers and police stations to complement the data gathered in media articles.

Only mass shootings with local or national media coverage are included in this sample. These mass shootings are thus not representative of the universe of mass shootings. The average number of death is seven and 12 of these mass shootings led to at least 10 casualties, suggesting that our sample contains the deadliest shootings. The backgrounds of perpetrators are compared with those of male Americans aged 20–50, using data from the 2010 American Community Survey (ACS).

2.2 Who Are Mass Shooters?

Perpetrators in our sample are on average 34 years old (std. dev. of 15) and 95% of shooters are male.[9]

Table 2 reports summary statistics for 97 perpetrators of mass shootings leading to at least four casualties, excluding the shooter.[10] Column 1 includes all mass shootings, while Columns 2, 3 , 4 and 5 restrict the sample to school-related (11 observations), workplace-related (21 observations), and other mass shootings (65 observations), respectively. Column 6

[9]The average age and the percentage of men in our sample are comparable to Duwe (2014) who analyzes 908 mass killings from 1900 to 1999. In his sample, 93 percent of the perpetrators are male and the average age is 30. The relatively older age of mass shooters and serial killers (in comparison to other criminals) is typically explained by the long-term accumulation of failure to produce enough frustration necessary to commit a mass shooting (Fox and Levin (1998)).

[10]Data on age and gender were obtained for all perpetrators. Information on the educational attainment, employment status and marital status were obtained for 45, 74 and 77 perpetrators, respectively.

reports summary statistics from the ACS for male Americans aged 20–50. Appendix Table A1 replicates Table 2, but adds mass shootings leading to at least four casualties, including the shooter. The sample size increases to 107. The main variables of interest refer to the risk factors, education and employment status of mass shooters.

Perpetrators often have more than one documented risk factor. This explains why the sum of percentages is greater than 100%. Risk factors are documented using different sources such as letters and social media posts by the perpetrators, police investigation and interviews with relatives and friends. In our sample, about 39% of individuals were in financial distress at the moment of the shooting. This figure increases to 67% for workplace-related incidents, while it decreases to 18% for school-related shootings. Financial distress includes being recently fired, having a history of financial difficulties or having a financial dispute with the victim(s). The perpetrators are often recently fired employees of the workplace they target. In some instances, they target the place of work of their (former) wife. Two other relevant risk factors are social rejection and school failure. About one-quarter of the perpetrators of school shootings had a history of school failure (i.e., expulsion, suspension or failing classes). Similarly, about one-quarter of the perpetrators of school shootings had a history of social rejection (e.g., bullying) or parents' divorce. The other documented risk factors in our sample include racial and religious hatred, and political ideals.

The perpetrators are disproportionately unemployed or out of the labor force. Only 42% are employed (or serving in the army) at the time of the shooting, in comparison to 69% for male Americans aged 20–50. The gap is even larger for workplace-related shootings with only 21% of individuals being employed. These findings suggest that economic distress may trigger rise in mass shooting targeting workplaces. For school-related shootings, about half of the perpetrators were enrolled in school or university.

We also collected information on the highest level of educational attainment. The perpetrators are overrepresented in the high school and below category. They were as likely to at least attend college than male Americans aged 20–45, but less likely to graduate.[11]

Table 2 also presents summary statistics broken down by marital sta-

[11]Another interesting exercise is to compare perpetrators of mass shootings to the characteristics of alleged homegrown Islamic terrorists. Krueger (2008a) collects data on 63 alleged homegrown Islamic terrorists since the first World Trade Center attack in 1993 and finds that about 75% of them attended or graduated college. In contrast, about 53% in our sample attended or graduated college.

tus and race. Perpetrators are disproportionately divorced or separated in comparison to male Americans aged 20–50 (about 13%). The gap is especially large for school and workplace-related incidents with about 45% of shooters being divorced or separated. Most perpetrators are white (51%), but this percentage is much lower than in our comparison group, suggesting that perpetrators are not disproportionately white. Shooters are also less likely to have at least one child than male Americans in our comparison group. About 81% of mass shooters were born in the U.S., which is strikingly similar to the percentage of male Americans aged 20–45 born in the U.S.

In our sample, we were able to confirm that (at least) 43% of shooters had a mental disorder, a history of mental illness or suffered from severe depression prior to the shooting. According to data from the Substance Abuse and Mental Health Services Administration, about 5% of men aged 26–49 had a serious mental illness in 2017 (Substance Abuse and Mental Health Services Administration (2017)). We also gather information on whether the perpetrator was or used to be in the military. We were able to confirm that (at least) 19% of the perpetrators were or used to be in the military. In contrast, data from the Department of Veterans Affairs suggest that approximately 10% of middle-aged men served or were serving in the military as of 2010. Last, about 95% of mass shootings occur in the metropolitan statistical area (MSA) where the shooter resides at the time of the shooting.

Overall, we provide evidence that a large share of mass shooters were in financial distress and/or out of work at the moment of the shooting. This pattern applies especially for non school-related incidents.[12]

3 Economic Consequences: Identification Strategy

In this section, we first assess whether mass shootings are predictable using local area characteristics. We then present our identification strategy to estimate the economics consequences of mass shootings.

3.1 Predicting Mass Shootings

Appendix Table A2 compares various local characteristics of counties with a successful mass shooting with other counties. We include the following

[12] See the Appendix (Section 7) for an investigation of whether there are differences in the socioeconomic characteristics of mass shooters for shootings which occurred in states that had adopted an right-to-carry (RTC) concealed handgun law in comparison to shootings which occurred in a stated which had not adopted an RTC law.

variables: natural logarithm of jobs per capita, natural logarithm of total real earnings per capita, natural logarithm of business establishments per capita, house value index, natural logarithm of population, proportion of male population, natural logarithm of population 18-65 years olds, proportion of population that completed high school, racial diversity HHI index, proportion of individuals living in poverty, income inequality Gini idex, natural logarithm of violent crime per capita, property crime per capita, homicides by gun per capita, and suicides by gun per capita, along with time-invariant geographic and urban factors. Time-varying variables are analyzed one year prior to the shooting.

Columns 1 and 2 show the mean of the variables. We see that counties with a successful mass shooting differ systematically from counties without a mass shooting in most dimensions. Specifically, we notice that counties with a successful mass shooting have much higher jobs per capita, total real earnings per capita, and business establishments per capita. This is not surprising as mass shootings tend to occur disproportionately in urban areas. Surprisingly, counties with a successful mass shooting have lower violent and property crime rates. Similarly, urban and geographic features associated with economic activity are correlated with the incidence of mass shooting. Counties which are located on the coast, have a large or medium hub airport, and counties in which the state capitol is located tend to have a higher share of successful mass shootings relative to other counties.

Overall, these results show that counties with a successful mass shooting tend to have more economic activity relative to an average county. This result and the fact that a large share of mass shooters were in financial distress at the moment of the shooting suggest that we can not infer the impact of mass shootings by simply comparing counties hit by successful mass shootings to non-targeted counties.

3.2 Identification Assumption

We now turn to estimating the economic consequences of mass shootings. In this subsection, we first evaluate whether the success of a mass shooting is plausibly random.

Table 3 reports various local characteristics for counties with a successful mass shooting (Column 1) and counties with a failed mass shooting (Column 2). Column 3 presents the difference in mean of variables in successful relative to failed mass shootings. We see that the success of a mass shooting is not related to the local economic fundamentals of the county.

Specifically, local job rate, real earnings, business establishments and house value are unrelated with the success of mass shooting. Similarly, the success of mass shootings is not related to population, racial diversity, income inequality, crime rate, and gun deaths. None of the reported differences is statistically significant at the 10% significance level.

Further, we assess whether local characteristics together predict the success of a mass shooting. Specifically, we estimate the following logit equation:

$$P(Success_s) = \phi(\gamma_1 + \gamma_2 X_s), \tag{1}$$

where $Success_s$ is equal to one for successful mass shootings, and zero for failed mass shootings. X_s is the set of variables mentioned in the previous table.

Table 4 shows the logit estimates. We report marginal effects. Time-varying variables are examined in the year before the mass shootings took place. In Columns 1 and 2, we include the natural log of jobs per capita and the natural log of total real earnings per capita, respectively. In Column 3, we include both variables together. Neither of the two variables individually or jointly predict success of a mass shooting. The p-value associated with the F-statistic of significance of these economic variables is 0.90. In addition, other local characteristics including demographic, inequality, racial diversity, crime, gun deaths, urban and geographic characteristics do not predict the success of a mass shooting. The p-value associated with the F-statistic of significance of these variables is 0.29. These results show that the success of a mass shooting cannot be jointly predicted by local area socioeconomic characteristics. Together, these results lend credibility to the identification strategy we employ in rest of the analysis.

3.3 Empirical Specification

To estimate the causal impact of mass shootings, we estimate the following empirical models.

First, we estimate a basic model by concentrating on the counties that had a successful mass shooting. That is, we carryout an event-study analysis by analyzing how the local economic outcomes change around a successful mass shooting. Specifically, we estimate the following model:

$$Y_{ct} = \gamma_c + \rho_t + \sum_{\tau=-5}^{\tau=4} \eta_\tau Success_{c,t-\tau} + \varepsilon_{ct}, \tag{2}$$

where Y_{ct} is economic outcome of interest in county c in the year t. $Success_{c,t}$

is a dummy variable equal to one if the county c had a successful mass shooting in the year t and zero otherwise. Similarly, $Success_{c,t-\tau}$ is a dummy equal to one for year τ before ($\tau > 0$) or after ($\tau < 0$) there was a successful mass shooting. We include county-year observations up to four years after the successful shooting and six years prior to the successful shooting. The year before the shooting is the omitted category. For counties with multiple mass shootings, we reset the clock to zero when the next shooting happens.

In all our estimations, we include county fixed effects to absorb differences in levels of the economic variables across counties. In addition, we include year fixed effects to absorb fluctuations in business cycles across different years. In augmented specifications, we further include regional dummies interacted with year and U.S. Census Division dummies interacted with year. We further include in models year dummies interacted with month-of-shooting dummies to capture seasonality effects at the national level. We cluster the standard errors at the state level to allow for correlation among counties located within the same state.[13]

Second, we estimate a model in which we compare the effect of successful mass shootings relative to failed mass shootings on economic outcomes.[14] We carryout a Differences-in-Differences (DiD) estimation by using a set of counties with either a successful or a failed mass shooting. We include county-year observations up to four years after and six years prior successful and failed shootings. (We later show that our main findings are robust to the use of other windows.) Specifically, we estimate the following:

$$Y_{ct} = \gamma_c + \rho_t + \psi PostShooting_{ct} + \beta Success_{ct} + X'_{ct}\theta + \varepsilon_{ct}, \qquad (3)$$

where Y_{ct} is economic outcome of interest in county c in the year t. $Success_{c,t}$ is a dummy variable equal to one for all years after the county c had a successful mass shooting and zero otherwise. $Post\ Shooting_{c,t}$ is a dummy variable equal to one for all years after the county c had either a successful or a failed mass shooting and zero otherwise.

ψ measures how the economic outcomes change in counties with a failed mass shooting after the failed shooting. β is the main parameter of interest, which captures how the economic outcomes change in counties with a successful mass shooting after the shooting relative to counties with a failed mass shooting. β would capture how a successful mass shooting dif-

[13]Clustering the standard errors at the county level generates smaller standard errors throughout our analysis.

[14]Note that our main findings are robust to using all counties instead of relying on counties with failed shootings as a comparison group. See Section 4 for the estimates.

ferentially impacts the county compared to a failed mass shooting. For β to reflect a causal impact of mass shooting, we require that the success of a mass shooting is exogenous conditional on observables. To relax this assumption, we include a vector of other regressors, X_{ct}, in augmented models. More precisely, we include the age and gender of the perpetrator, dummies for the type of weapon used (i.e., (1) handgun, (2) rifle, (3) shotgun, (4) other gun, and (5) unknown) and a dummy for whether the mass shooting ended because of law enforcement intervention.[15]

Third, to study the dynamic effect of successful relative to failed mass shootings, we combine both strategies. That is, we estimate a Difference-in-Difference estimation by including leads and lags of the *Post Shooting* and $Successful$ variables. Specifically, we estimate the following:

$$Y_{ct} = \gamma_c + \rho_t + \sum_{\tau=-5}^{\tau=4} \xi PostShooting_{c,t-\tau} + \sum_{\tau=-5}^{\tau=4} \nu Success_{c,t-\tau} + X'_{ct}\theta + \varepsilon_{ct}, \quad (4)$$

where Y_{ct} is an economic outcome of interest in county c and year t. *Post* $Shooting_{c,t}$ ($Success_{c,t}$) is a dummy variable equal to one if the county c had a successful or a failed (successful) mass shooting in year t and zero otherwise. Similarly, *Post* $Shooting_{c,t-\tau}$ ($Success_{c,t-\tau}$) is a dummy equal to one for year τ before ($\tau > 0$) or after ($\tau < 0$) there was a successful or failed (successful) mass shooting. We include county-year observations up to four years after a mass shooting and six years prior to the shooting. The year before the shooting is the omitted category.

4 Economic Consequences: Main Results

In this section, we present the main results. We first present results from the event study analysis, and then discuss results obtained using the Differences-in-Differences strategy.

4.1 Impacts on Employment, Earnings, and Establishments

4.1.1 Event-Study Table 5 shows the results from the event-study analysis for the set of counties with a successful mass shooting. The dependent variables are the natural logarithm of the ratio of jobs to population

[15] The dummy for whether the mass shooting ended because of law enforcement intervention is equal to one if law enforcement arrived before the perpetrator fled, was subdued by someone who was already on the scene, or committed suicide. Unfortunately, this information is missing for a small number of successful shootings. The dummy is coded as zero for these missing values. Omitting these successful shootings from our sample yields similar conclusions.

(Columns 1–3), and the natural logarithm of the ratio of real earnings to population (Columns 4–6), respectively. We include county and year fixed effects in all columns. Columns 2, 3, 5 and 6 add controls for the age and gender of the perpetrator, weapon used fixed effects and year × month fixed effects to the model. Columns 3 and 6 add region × year fixed effects.

Columns 1–3 show that, on average, employment per capita decreases by around 1% immediately after a successful shooting. The magnitude of the effect increases to about 1.6% in the year after the shooting. The effect persists for several years after the shooting and can be seen even three years after a successful mass shooting. Importantly, we do not see any significant difference in the employment per capita prior to the shooting, suggesting that mass shootings are not the outcome of a local recession. The estimates for four, three and two years prior to the shooting (in comparison to one year prior) are all small and statistically insignificant.

Columns 4–6 present our estimates for earnings. Similarly, we find that earnings per capita decrease by around 1.4% right after a successful shooting (Column 2). The effect persists for several years after the shooting. It is re-assuring to see that the estimates prior to the shooting are all small and statistically insignificant.

In Appendix Table A3, we analyze how the number of business establishments changes around a successful mass shooting. We find that business establishments decrease by 0.6% immediately following a successful mass shooting (Column 2). We find that the number of business establishments decrease by about 1% up to three years after a successful shooting. The estimates for the years prior to a successful mass shooting presented are all statistically insignificant.

We illustrate our results by plotting the estimated coefficients. Figure 2 plots how the employment changes around a successful mass shooting at yearly intervals before and after the shooting. We see that the employment per capita does not change prior to a successful mass shooting. The employment dip following a successful mass shooting and remains economically large and statistically significant several years after the shooting. Figure 3 shows a similar impact of successful mass shooting on real earnings, i.e., county total earnings decrease sharply after a successful shooting. Finally, Appendix Figure A4 illustrates the impact of a successful mass shooting on business establishments. We see a slightly smaller but statistically significant impact on the number of establishments. Together, these results show that successful mass shootings lead to a significant negative impact on local economies.

In Appendix Tables A4 and A5, we perform a similar analysis on the set of counties with a failed mass shooting. We see that the economic variables do not change systematically around a failed mass shooting. The economic variables are similar both prior to and after a failed mass shooting. The results are both economically small in magnitude and statistically insignificant. Appendix Figures A5, A6, and A7 plot employment, earnings and establishments estimates for failed mass shootings, respectively. We do not see any jump in these variables around a failed mass shooting. These results suggest that failed mass shootings do not generate any economic impact on targeted counties.

4.1.2 Differences-in-Differences In this section, we directly compare counties hit by successful and failed mass shootings. Table 6 shows the results. In Panel A, we analyze how the employment changes after successful and failed mass shootings. In Column 1, we only include the variable "Post Shooting". We find that failed and successful mass shootings together do not impact employment. In Column 2, we add our variable of interest to the model, "Success". A successful relative to a failed mass shooting results in a 1.8% reduction in employment per capita. The estimate is statistically significant at the 1% level. Column 3 adds the age and gender of the perpetrator, weapon used fixed effects and month × year fixed effects to the model. Column 4 adds a dummy for whether the shooting ended because of law enforcement intervention. The point estimates are slightly larger and remains statistically significant at the 1% level. The effect of a successful relative to failed mass shooting remains similar if we include interactions between year fixed effects and the four Census regions (Column 5) or nine Census divisions (Column 6) to absorb time-varying regional employment shocks. A successful relative to failed mass shooting results in a 1.7% reduction in employment per capita (Column 6).

In Panel B, we study how total real earnings change after successful and failed mass shootings. We see that successful and failed mass shootings together do not lead to a change in total real earnings (Column 1). Our estimates in Column 2 show that a successful mass shooting results in a 2.8% reduction in total real earnings. The effect remains unchanged if we include shooting controls or Census region/division fixed effects interacted with year fixed effects. All the estimates for successful shootings are statistically significant at the 1% significance level and range between -2.6 to -2.9%.

In Panel C, we examine how the number of business establishments change after successful and failed mass shootings. We see that successful and failed mass shootings together do not lead to a change in the business establishments (Column 1). We find that the number of business establishments drop by 1.3% in counties with a successful mass shootings in the years following the mass shooting (Column 2). This finding is robust to the inclusion of our additional set of controls.

In Figures 4, 5 and Appendix Figure A8, we plot the impact on employment, earnings and the number of business establishments obtained through estimation of Equation 4. Successful relative to failed mass shootings result in an immediate fall in the employment, which persists for several years after the shootings. We see that counties with a successful mass shooting had a similar trend in employment, earnings and number of establishments compared to counties with a failed mass shooting prior to the shooting. The estimates for the years prior to the shooting are much smaller than the estimates obtained for the year of the shooting and statistically insignificant. (These estimates are shown in Appendix Tables A6 and A7.)

Together, these results show that successful mass shootings result in significant economic loss for counties hit by a successful shooting. The estimated effect of 1.7% presented in Table 6 suggests that successful shootings decrease the number of jobs by about 6,000 (baseline of approximately 400,000 jobs). An interesting exercise is to benchmark the estimated effects of mass shootings to the impact of domestic terrorism and natural disaster. Brodeur (2018) analyzes the impact of terror attacks (e.g., radical environmental, hate and religious groups) in the U.S. on employment and earnings. He finds that terror attacks decrease targeted counties' employment and earnings by approximately 2% in the years following the attack. Strobl (2011) documents the impact of hurricanes on economic growth for targeted counties. He finds that an average hurricane would reduce a county's annual growth rate by 0.45 percentage points. In contrast to natural disasters, mass shootings result in very small direct economic loss as measured by a loss in capital and infrastructure. Our results thus suggest that other mechanisms are at play. We shed light in Section 5 on potential mechanisms that may explain why we find large impact of mass shootings on local economies.

4.1.3 Additional Results

We now analyze separately the impact of workplace shootings, school shootings, and other shootings. Appendix Table A8 shows the estimates for the Differences-in-Differences model for each type of successful shootings separately. Our findings suggest that the three types of shootings lead to a decrease in employment. Mass shootings occurring in the workplace have the largest impact on employment and earnings, while other successful shootings (i.e., non-school and non-workplace mass shootings) lead to the smallest decrease in employment and earnings.

In Appendix Table A9, we show that successful mass shootings in comparison to failed shootings also reduce real earnings per job. The estimates are statistically significant at conventional levels and range from 0.9 to 1.1%. Our findings thus suggest that successful shootings decrease county total earnings both because of a reduction in employment and a reduction in wage per job.

Appendix Table A9 also analyzes how successful relative to failed mass shootings affect employment per establishment. The main dependent variable is the natural logarithm of the ratio of employment to establishments. We see that all the estimates for "Success" are negative, but not statistically significant at conventional levels.[16]

Appendix Table A10 examines how the effect of successful mass shootings might vary by establishment size. We categorize establishments into three categories: small (1 to 99 employees), medium (100 to 499 employees) and large (500 employees or more). The dependent variables are the natural log of 100 $\times$ the number of small- (Panel A), medium- (Panel B) and large-sized establishments (Panel C), respectively. The estimates for the variable "Success" across the different specifications are all negative for small-sized establishments. The estimates range from -1.1 to -1.4% for small-sized establishments and are statistically significant at the 1% level. These findings suggest that successful mass shootings lead to small business establishments closure. The estimates for medium-sized establishments are also negative and range from -0.5 to -1.3% but are not statistically significant at conventional levels. The estimates for large-sized establishments are positive and imprecisely estimated. This is likely due to the small number of large firms on average in counties hit by mass shootings. These results suggest that the effect on employment is driven by small firms shutting down and a small decrease in the average number of employees per firm (although imprecisely estimated).[17]

[16]Similarly, we do not find evidence that successful mass shootings decrease the number of employee per establishment using data from the QCEW. Analyzing the effect of mass shootings on employment per establishment for each industry separately yields similar conclusions. Estimates available upon request.

[17]We also find that successful mass shootings are associated with lower hiring rates, but also with lower job separation rates (results available upon request). In other words, mass shootings make jobs more stable, but harder to get. Similar findings have been uncovered following an increase in the minimum wage (Brochu and Green (2013)).

We now test whether the effects of mass shootings are local and fade away with (physical) distance. More precisely, we estimate the effect of successful shootings on counties neighboring the targeted county in comparison to counties neighboring a county targeted by a failed shooting. The estimates are presented in Appendix Table A11. We find that neighboring counties also experience a small decrease in employment and earnings, although the estimates are smaller and statistically insignificant at conventional levels.

4.2 Robustness Checks

In this subsection, we test the robustness of our main findings. We first check whether relying on the QCEW employment and earnings data yield similar conclusions. Appendix Table A12 replicates the structure of Table 6. The estimates for employment (panel A) and earnings (panel B) are all negative and statistically significant, confirming that successful mass shootings in comparison to failed shootings decrease employment of targeted counties. The estimates suggest that successful mass shootings decrease employment and earnings by approximately 1% and 2%, respectively. The estimates for the number of establishments per capita (panel C) and earnings per job (not shown for space consideration) are also negative and statistically significant. Thus, are results are robust to relying on alternate data for the main economic variables.

In Appendix Table A13, we check whether our main results are robust to different pre- and post-mass shootings windows. In our baseline specification, we rely on four years after and six years prior the shooting. We present the estimates of 16 specifications for our three main outcome variables. We show that using three, four, five or six years pre/post mass shootings has no effect on our main conclusions. The estimates are all statistically significant at conventional levels for our three outcomes, and range from -1.2 to -1.6% for employment, -2.2 to -2.5% for total earnings, and -1.1 to -1.3% for establishments.

Next, we estimate our main results using all observations. That is, instead of using only the set of counties with a successful or failed mass shooting, we use all U.S. counties. Appendix Tables A14, A15, and A16 show the estimates of the main results. The counties with a successful mass shooting are similar to other counties prior to the shootings, and have a long-term decrease in the employment and earnings after the shootings. The estimates are statistically significant and of similar magnitude to the ones obtained using the restricted set of counties.

We also test whether our main conclusions are robust to omitting specific mass shootings or years from our sample. First, Appendix Figures A9, A10 and A11 illustrate the point estimates obtained by dropping each pair of successful and failed mass shootings for a given year. Our estimates for employment, earnings and business establishments remain negative and statistically significant at the 5% level. Second, we test whether omitting any of the states from our sample affects our main conclusions. The estimates are presented in Appendix Figures A12, A13 and A14. The employment estimates are all statistically significant at conventional levels and range from -1.3 to -1.75%. These results suggest that our findings are not driven by a few specific mass shootings.

One may be concerned that the location and timing of successful and failed mass shootings varies systematically with some unobservable variables that may lead to a spurious relation between successful mass shootings and economic outcomes. To address this concern, we perform permutation tests by randomly assigning the location and timing of successful and mass shootings. We do so by keeping the number of successful and failed mass shootings in the randomly generated sample similar to the original number of successful and failed mass shootings. We repeat this exercise 1,000 times. Appendix Figures A15, A16 and A17 plot the distribution of the estimates of "Success" for employment, earnings, and establishments, respectively. The vertical line shows the estimates obtained using the actual location and timing of successful and failed mass shootings. We see that only one, two, and two estimates from this exercise are more negative than the actual estimates.[18]

It is important to emphasize that the dependent variables in our analysis uses population as a denominator. This is problematic if mass shootings lead to out-of-county migration. We check whether this is the case in Appendix Table A17. We rely on population as a dependent variable and estimate Equation 3. The estimates are all small and statistically insignificant, suggesting that mass shootings do not lead to net migration.[19]

[18] Appendix Figures A18, A19 and A20 plot the distribution of the t-statistics of "Success" for employment, earnings, and establishments, respectively. The vertical line shows the t-statistics obtained using the actual location and timing of successful and failed mass shootings. We see that only one, two, and one t-statistics from this exercise are more negative than the actual estimates.

[19] One may be further concerned that successful mass shootings may lead to selective migration of different age groups. In Appendix Table A18, we show that the distribution of population does not change in successful relative to failed mass shootings. In Appendix Table A19, we also show that the flow of migration into and out of the county does not change as a result of successful or failed mass shootings.

Last, we check whether our results are sensitive to the definition of failed mass shootings. In Appendix Table A20, we replicate our results using only failed mass shootings with a certain number of deaths. From Columns 1 to 4, we define the sample of failed mass shootings as failed mass shootings with no deaths, at most one deaths, at most two deaths, and at most three deaths, respectively. Our main results are robust to using any number of deaths (below four) as a cutoff for failed shootings. In Appendix Table A21, we show that excluding failed mass shootings that ended due to different causes does not change our main results. Specifically, we show that omitting failed mass shootings in which the perpetrator fled the scene before law enforcement arrived (Column 1), ended because a citizen(s) restrained or subdued the perpetrator (Column 2), ended with law enforcement intervention (Column 3), or ended with the perpetrator committing suicide before law enforcement arrived (Column 4) has no effect on the sign, magnitude and significance of our main estimates.

5 Economic Consequences: Potential Mechanisms

An established literature shows that regions exposed to conflict and violent crime tend to experience deterioration in labor market conditions (Abadie and Gardeazabal (2003); Blattman and Miguel (2010); Keefer and Loayza (2008)). Our context is somewhat different since mass shootings do not lead to physical capital destruction and typically cause a small number of casualties. Furthermore, mass shootings typically do not occur in the same location, whereas terrorists and criminals often target the same areas repeatedly. Therefore, other channels may likely explain our main findings on the economic impact.

In this section, we examine and document potential mechanisms through which mass shootings may affect local economies. Mass shootings are highly salient events as recent surveys suggest that being killed in a mass shooting is one of the top fears among Americans (Bader (2016)). A first channel is fear and uncertainty.[20] While the likelihood to be hit by multiple mass shootings within a few years is very low, fear of future shootings (or violent crime) might still depress local employment and housing prices (Gautier et al. (2009); Gibbons and Machin (2008)), consumer sentiment

[20]Another channel through which mass shootings could affect people is through locus of control (Caliendo et al. (2015)). One hypothesis is that people are simply feeling less in control of their own destiny after a shooting, i.e., locus of control shifts from internal to becoming more external. A (temporary) shift from internal to external is relevant in our context since there is growing empirical evidence that having an internal locus of control is associated with labor market success (Cobb-Clark (2015)).

(Brodeur (2018)), consumption of leisure and hospitality industry-related goods (Lepp and Gibson (2008); Sönmez and Graefe (1998)), and investment (Pinotti (2015)).[21]

Increased uncertainty following a mass shooting may affect local economies through reduced investment. Bloom et al. (2007) argue that the responsiveness of firms to policy stimulus may be much weaker in periods of high uncertainty. They provide empirical evidence that manufacturing companies in the U.K. subject to more uncertainty are more cautious with their investment. Conflict has also been linked to policy uncertainty. For instance, Baker et al. (2016) build an index of economic policy uncertainty and report that the index spiked near the Gulf Wars I and II and the Sept. 11, 2001 attacks. To this end, we empirically test the effect of mass shootings on consumer confidence and pessimism about business conditions among residents of targeted counties.

Another channel through which mass shootings could affect employment is a decrease in productivity. A large literature points out that terror attacks and violent crime deteriorate mental health due to stress or fear (e.g., Metzl and MacLeish (2015)). Deteriorated mental health could affect employment by decreasing productivity and increasing absenteeism. We show evidence in favor of this channel by using data from the BRFSS.

Last, we investigate the role of media. More precisely, we test whether more national coverage of the shooting in the media amplifies the negative effect of the incident. While our analysis is at the county level, we believe looking at national media coverage is key since shootings receiving more national coverage might remain more salient for longer in people's minds. This may mean that people from other counties will be aware of the shooting and might ask residents of targeted counties more and longer about the shooting. This may translate into less tourism and less out of county investment. We test empirically the effect of successful mass shootings on tourism using employment data in the leisure and hospitality industry (Lepp and Gibson (2008); Sönmez and Graefe (1998)).

5.1 Housing

In this subsection, we study whether mass shootings result in a negative impact on the housing market. We use a county-year level house price index

[21] A growing empirical literature documents that house prices are negatively associated with the incidence of conflict (Besley and Mueller (2012); Elster et al. (2017)). In our context, mass shootings could affect the local housing market through fear of future dangers.

compiled by Bogin et al. (2019). Bogin et al. (2019) utilize proprietary data set of mortgage transactions and infer house prices using repeat-sales methodology. We use the house price index as the dependent variable and estimate Equation 3.

Table 7 shows how the house price index changes in counties with successful and failed mass shootings. We see that successful mass shootings result in a significant decrease in housing prices for targeted counties. Our estimates with the full set of controls suggest that house price decrease by 2.8% after a successful relative to a failed mass shooting. These results suggest that successful mass shootings negatively affect the local housing market.

5.2 Estimates By Ownership and Industry

We now investigate whether mass shootings affect differentially government and private employment. It is *a priori* unclear whether mass shootings might affect positively or negatively the number of government jobs in targeted areas. On the one hand, negative shocks to local economies may reduce government revenues. On the other hand, a vast literature documents an increase in security and police force following a major violent crime or a terror attack (e.g., Draca et al. (2011); Di Tella and Schargrodsky (2004)).

We present the estimates in Appendix Table A22. We present estimates of Equation 3 where the dependent variables are the natural logarithm of the ratio of private jobs to population and the natural logarithm of the ratio of government jobs to population. We rely on QCEW employment data for this exercise. The findings suggest that successful mass shootings in comparison to failed shootings decrease the number of private jobs by about 1.5%. The estimates are statistically significant at conventional levels. In contrast, there is no evidence that successful mass shootings significantly affect government jobs in targeted counties. The estimate is small, positive and statistically insignificant at conventional levels.[22]

We also check whether mass shootings decrease employment in specific industries. Appendix Table A23 presents our estimates. The dependent variables are 100 $\times$ the natural logarithm of ratio of jobs to population for the following industries: service-providing (Column 1, panel A), professional and business services (Column 2, panel A), education and health

[22] Disaggregating the number of government jobs by government levels does not change our conclusions. That is, we do not find evidence that successful mass shootings significantly affect the number of federal, state and local government jobs, respectively. Results available upon requests.

services (Column 3, panel A), other services (Column 4, panel A), leisure and hospitality (Column 5, panel A), financial activities (Column 6, panel A), manufacturing (Column 1, panel B), goods-producing (Column 2, panel B), natural resources and mining (Column 3, panel B), construction (Column 4, panel B) and trade, transportation, and utilities (Column 5, panel B).

Overall, we find that successful mass shootings affect most industries, with the largest effects found for manufacturing, goods-producing, natural resources, and mining and construction. In contrast, our estimates are mostly negative, small and statistically insignificant at conventional levels for the service industries, i.e., service-providing, professional and business services, education and health services and other services. We also find that mass shootings significantly decrease employment in the leisure and hospitality industry, suggesting that the number of tourists decreases following a successful incident.

5.3 Consumer Sentiment

Next, we examine how residents of targeted counties might respond to a mass shooting, by adjusting their consumption or business decisions, using data from the Michigan Survey of Consumers. As explained in Section 1, this telephone survey is meant to measure consumer sentiment. We rely on the four main questions and compare answers before and after a successful mass shooting to answers before and after a failed mass shooting.[23] Our sample size is about 4,300. We have mass shootings and respondents for 77 counties. We therefore have approximately 56 individuals per county.

We present our estimates in Table 8. In Column 1, we rely on the following question: "We are interested in how people are getting along financially these days. Would you say that you are better off or worse off financially than you were a year ago?" The dependent variable is equal to one if respondents report "Worse" and zero otherwise. In Column 2, the dependent variable is based on answers to the question: "Would you say that at the present time business conditions are better or worse than they were

[23] We estimate the following specification:

$$Y_{ict} = \gamma_c + \rho_t + \beta Success_{ct} + \psi PostShooting_{ct} + X'_{ict}\lambda + \varepsilon_{ict}, \quad (5)$$

where Y_{ict} is an outcome variable for individual i in county c and month t. $Success_{c,t}$ is a dummy variable equal to one after a successful mass shooting and zero otherwise. $Post\ Shooting_{ct}$ is a dummy variable equal to one after after either a successful or a failed mass shooting and zero otherwise. Individual controls include age, age squared, gender, four education dummies and four marital status dummies. We estimate the equation by relying on 12 months of observations pre- and 12 months of observations post-shooting.

a year ago?" The dependent variable is equal to one if respondents report "Worse now" and zero otherwise. In Column 3, the dependent variable is based on answers to the question: "Now looking ahead–do you think that a year from now you will be better off financially, or worse off, or just about the same as now?" The dependent variable is equal to one if respondents report "Will be worse off" and zero otherwise. In Column 4, we rely on this question: "About the big things people buy for their homes–such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or a bad time for people to buy major household items?" The dependent variable is equal to one if respondents report "Bad" and zero otherwise.

The estimates in Columns 1 and 2 are positive and statistically significant at conventional levels, suggesting that residents of counties targeted by a successful mass shooting in comparison to a failed shooting are more likely to say that their personal finance and current business conditions are about 5% worse than a year ago (i.e., before the shooting). Residents of counties hit by a successful mass shootings are 2.7% more likely to think that they will be worse off financially in the future (Column 3), but the estimates are not statistically significant at conventional levels. Last, the estimate for "Success" presented in Column 4 is positive, economically small in magnitude, and statistically insignificant, suggesting that successful shootings does not increase the likelihood to think that it is a bad time to purchase major household items. Together, these results show that successful mass shootings lead residents of targeted counties to be more pessimistic of their own financial situation and overall business conditions.

5.4 Health and Absenteeism

We now check whether mass shooting affect employment through increased absenteeism at work using data from the BRFSS. As explained in Section 1, we rely on answers to the following question for our analysis: "During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?" We restrict the sample to respondents who report being employed, self-employed or unemployed and exclude individuals who report being disabled, homemaker, student or over 65 years of age. We compare answers before and after a successful mass shooting to answers before and after a failed mass shooting. The mean of the dependent variable is 1.43 days during the past 30 days (std. dev. of 4.55).

Table 9 presents the Poisson estimates. (We report the coefficients for the control variables in Appendix Table A24.) In Column 1, we restrict the sample to one year prior or following a shooting, while Column 2 (3) restrict the sample to three (five) years prior or following a shooting. The sample size is 27,030 respondents in Column 1. The estimates for "Success" are positive and statistically significant at conventional levels in all columns. The estimate presented in Column 1 suggests that successful shootings in comparison to failed shootings increase the number of days during which poor health kept the respondent from doing usual activities by 0.25. The estimated effect of successful shootings is larger than the gap in answers between men and women and about three-fifth the size of the difference in answers between high school and college graduates. Of note, though, the magnitude of the effect decreases by more than half when the sample includes more years prior or following the shooting.

Our findings suggest that successful mass shootings increase the likelihood that poor health makes the residents of targeted counties unable to do their usual activities such as working. It is thus plausible that shootings may decrease productivity through poor health.

5.5 Media Coverage

In this section, we test whether successful mass shootings are more salient than failed mass shootings. To do so, we collect data on the news coverage of successful and failed mass shootings in the national media. The data collection is detailed in the Section 1.5. We only use the year of the shooting in our estimation. We control for scale-effects by including a variable measuring the number of news stories not related to the mass shooting for the city where the mass shooting occurred in our estimation.[24]

Table 10 shows the results. In Panel A, the dependent variable is a dummy variable equal to one if the shooting was covered in national media. In Panel B, the dependent variable is the natural logarithm of the number of news stories on the mass shooting in the national media, while the dependent variable is the number of minutes dedicated to the shootings. Column 1 shows that the probability of a successful mass shooting receiving national media coverage in any of the three major broadcasting channels

[24]We estimate the following specification:

$$Y_{cst} = \gamma_s + \rho_t + \beta Success_{cst} + X'_{cst}\lambda + \varepsilon_{cst}, \tag{6}$$

where Y_{cst} is a measure of news coverage of the shooting in county c, state s and year t. $Success_{c,t}$ is a dummy variable equal to one after a successful mass shooting and zero otherwise.

is approximately 14% higher than for a failed mass shooting. In Columns 2–4, we see that successful relative to failed mass shootings are more likely to receive media coverage by ABC, CBS, and NBC, respectively. The coefficients are all positive and economically large in magnitude, though some of them are imprecisely measured. Similarly, successful relative to failed mass shootings receive about 48%, 34%, and 35% more news stories and lead to 60%, 33%, and 37% more minutes of coverage of the event at ABC, CBS, and NBC, respectively

Next, we aim to understand whether more media coverage of the mass shootings contribute to their impact on economic outcomes. We cannot answer this question in the absence of exogenous variation in the media coverage. The national media coverage of mass shootings is likely to be endogenous. For instance, mass shootings that occur close to the center of the county population are more likely to receive higher national media coverage. At the same time, these mass shootings are more likely to have a stronger effect on the county economic outcomes. This may lead to a downward bias in the OLS estimates.

To establish causal impact of media coverage of mass shootings on the economic outcome, we employ the concept of news pressure introduced by Eisensee and Stromberg (2007). We use the fact that natural disasters around the time of mass shootings may crowd out news coverage of the shootings. That is, natural disaster around the time of shootings may lead to less extensive coverage of the shootings.

In particular, we implement an instrumental variable strategy where in a first stage we predict the news coverage of mass shootings by whether it occurred during time of a natural disaster. We use the exact dates of the shootings and natural disasters to characterize whether a mass shooting took place during time of natural disaster. Overall, there are 20 mass shootings that occur during a natural disaster. We then use this predicted media coverage of each shooting in the second stage to estimate the impact of media coverage of mass shootings on economic outcomes. We focus only on successful mass shootings for our analysis. We estimate the following specification:

$$\begin{cases} Media_{cst} = \gamma_s + \rho_{dt} + \pi ND_{cst} + X'_{cst}\lambda + u_{cst}, \\ \Delta Y_{cst} = \gamma_s + \rho_{dt} + \beta \widehat{Media}_{cst} + X'_{cst}\gamma + \varepsilon_{cst}, \end{cases} \tag{7}$$

where $Media_{cst}$ measures the media coverage of the mass shooting in the national media (either the number of news stories or the total duration of news stories). ND_{cst} equals one if there was a natural disaster in the

U.S. on the exact date of the shooting and zero otherwise. ΔY_{cst} is yearly change in the economic variable of interest. $\widehat{Media}_{cst}$ is the predicted media coverage from the first stage. X'_{cst} is a vector of control variables for the total number of individuals killed in the mass shooting and the total number of people affected by the natural disaster.[25]

Appendix Table A25 shows estimates of the first stage. The dependent variables are the number of news stories in Columns 1 and 2, and the total duration of news coverage in Columns 3 and 4. In Columns 1 and 3, we control for the number of victims that were killed in the mass shootings as this is an important predictor of national media coverage. In Columns 2 and 4, we additionally control for the total number of people that were affected by the disaster. In all the estimations, we include state fixed effects along with Census division-year fixed effects. In Column 1 (Column 2), we see that mass shootings that occur the same day as a natural disaster attract 3.3 (2.9) fewer stories relative to mass shootings that occur during other times. The effect is economically large in magnitude as the mean number of news stories that a mass shooting receives is 4.4. The estimate is statistically significant at the 5% significance level. To gauge whether the instrument suffers from a weak instrument problem, we also report the effective first-stage F statistic proposed by Olea and Pflueger (2013). The Olea and Pflueger (2013) propose a test for weak instruments that is robust to heteroskedasticity, serial correlation, and clustering. We obtain a Montiel-Pueger F Statistic of 10.1 and 8.6 in Columns 1 and 2, respectively, showing that our instrument is relevant.

Natural disaster also crowd out duration of news stories on successful mass shootings. In Column 3 (4), we see that mass shootings that occur the same day as a natural disaster receive 10.4 (9) minutes of lower news coverage in the national media relative to other mass shootings. Given that an average mass shooting receives 22.8 minutes of national media coverage in our sample, the effect is economically large. The estimate is statistically significant at the 10% significance level and the Montiel-Pueger F Statistic is 6.8 and 5.5 in Columns 3 and 4, respectively.

Table 11 shows the results from the second stage. Columns 1 and 4 show the results obtained from OLS estimation. Columns 2 and 5 show the IV

[25] One concern about validity of the instrument could be that there is an overlap in the timing of successful mass shooting and natural disaster. In particular, we would be concerned if the counties with a successful mass shooting had a natural disaster in the same or the preceding year. This would violate the exclusion restriction because natural disasters will lead to a direct effect on the economic outcomes. We investigate the location and timing of natural disaster and find that there is no overlap in the timing of successful mass shooting and natural disaster.

estimation controlling for the number of shooting victims. (Omitting this control variable from the model has no effect on the size and significance of our IV estimates.) Columns 3 and 6 additionally account for the total number of people affected in the natural disaster. In Columns 1–3, the main independent variable is the number of news stories in the national media. In Columns 4–6, the main independent variable is the duration of news stories in minutes in the national media.

In Panel A, the dependent variable is the change in the natural logarithm of employment per capita. The OLS estimate in Column 1 shows that the estimate of media coverage is economically small and statistically insignificant. The IV estimate in Column 2, however, shows that national media coverage of mass shootings lead to a lower employment per capita. One additional news story on mass shooting in the national media leads to an 0.36% decrease in the employment per capita. Mass shooting in our sample (excluding the biggest mass shooting) received on average 3.7 news stories in the national media. The estimates thus suggest that the average number of news stories on national media of mass shootings leads to a 1.1% decrease in the employment per capita. The estimates remain similar if we control for the intensity of the natural disaster.

We obtain similar results if we use the duration of news coverage as the main independent variable. The IV estimate in Column 5 shows that the duration of news story about the mass shooting contributes towards lowering the number of jobs for the targeted county. One additional minute of news coverage of mass shooting in the national media leads to a 0.11% decrease in the employment per capita. An average mass shooting in our sample (excluding the three biggest shootings) received 14.5 minutes of news coverage in the national media. The estimates thus suggest that the average number of minutes of national media coverage of mass shootings leads to a 1.6% decrease in the employment per capita.

In Panel B, the main dependent variable is the change in the natural log of total real earnings per capita. Columns 1 and 4 present the OLS estimates which are statistically insignificant and economically small in magnitude. Columns 2 and 3 show that a greater number of news stories on mass shootings in the national media lead to a larger decrease in total real earnings. One additional news story about mass shootings in the national media leads to a 0.66% (Column 2) decrease in total real earnings per capita. We obtain consistent results if we use the total duration of coverage of mass shootings as the main independent variable. One additional minute of coverage of mass shootings in the national media leads to 0.21% (Column

5) decrease in the total real earnings per capita.

6 Conclusion

This paper provides the first detailed economic analysis of mass shootings. We focus both on the economic determinants and consequences of mass shootings. The novel data on the socioeconomic characteristics of perpetrators imply that financial distress or being laid off may trigger rise in mass shooting not targeting schools. The perpetrators are also disproportionately high school dropouts and divorced/separated. These results suggest a possible role for job-market interventions aimed at high-risk individuals (Grogger (1991)). Of note, non-socioeconomic risk factors such as mental illness and social rejection remain key in predicting violent crime.

Analyzing the economic consequences of mass shootings, we have found that on average, a mass shooting may have economically significant negative effect on the local labor market. Our estimates suggest that successful mass shootings reduce employment and earnings by about 2 percent. Further, the incidence of mass shooting appears to be negatively associated with housing prices. Analyzing the channels, we provide suggestive evidence that successful mass shootings decrease consumer confidence and increase absenteeism. Last, we show that national media coverage of mass shootings exacerbate the negative economic consequences for targeted areas.

Taken as a whole, our results suggest that the economic consequences of mass shootings are quite significant for targeted areas, confirming the need for public policy efforts towards financial support and examining how to best mitigate the associated risk (Krouse and Richardson (2015); Luca et al. (2019)). In particular, our findings concerning the role of the media raises questions on how mass media should cover these kinds of incidents. Further research leading to policy suggestions remains an important challenge.[26]

[26] One example of media policy would be to avoid detailed discussion of mass shooters' *modus operandi* or manifesto. For instance, NBC News broadcasted parts of the package of photos and video received from the perpetrator of the Virginia Tech shooting. The American Psychiatric Association sent an open letter to NBC and news media "urging them to stop airing" and mentioned that it could "seriously jeopardizes the public's safety by potentially inciting 'copycat' suicides, homicides and other incidents." (American Psychiatric Association (APA) (2007)).

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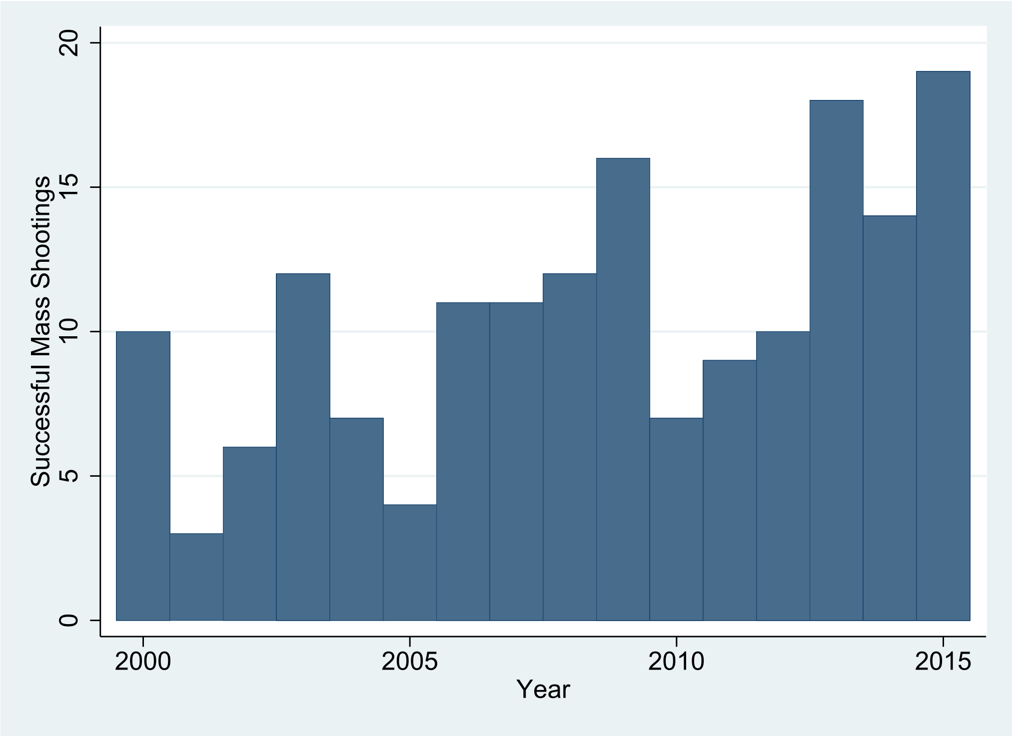
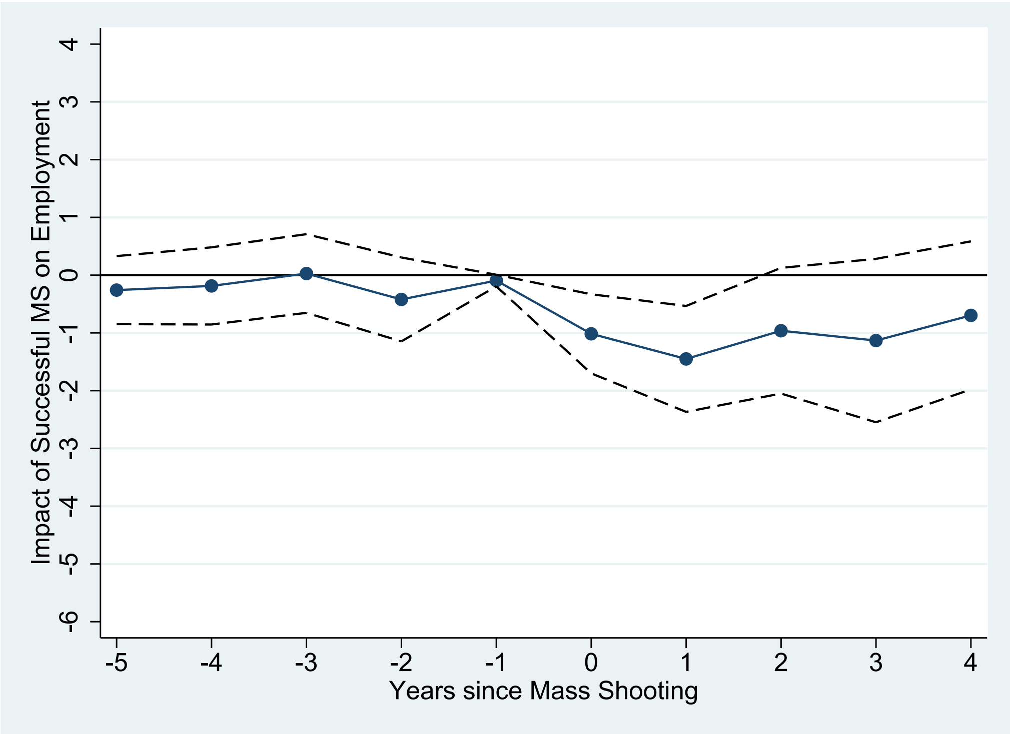
Figure 1: Mass Shootings (2000–2015)



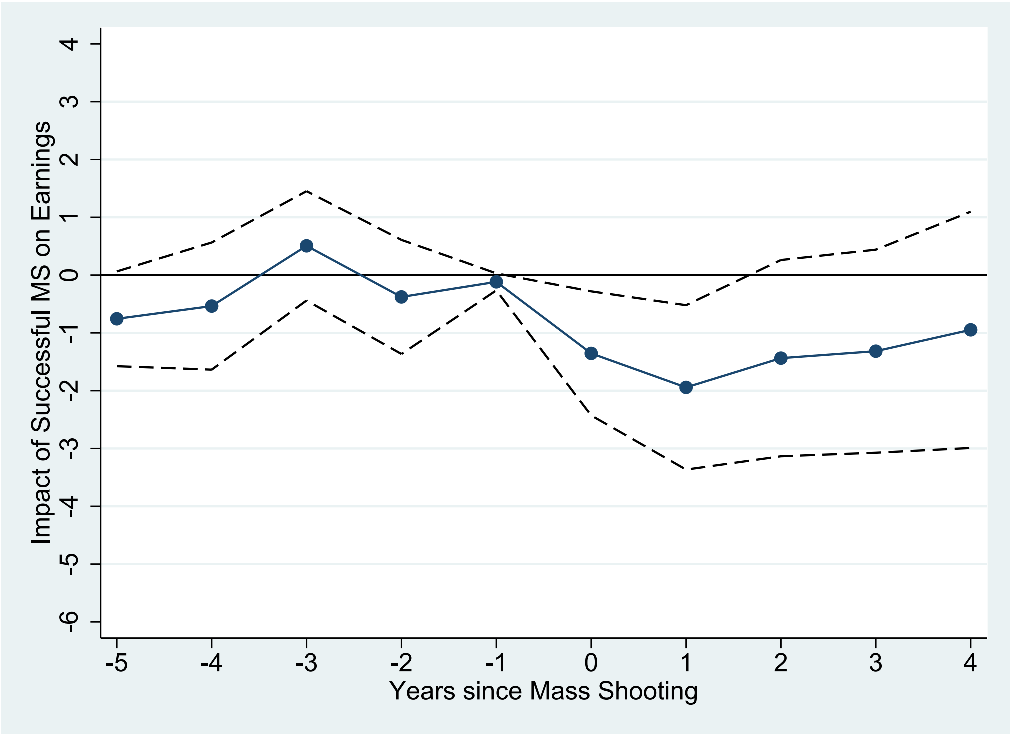
Notes: The Figure plots the number of successful mass shootings from 2000 to 2015.

Figure 2: Impact of Successful Mass Shooting on Employment



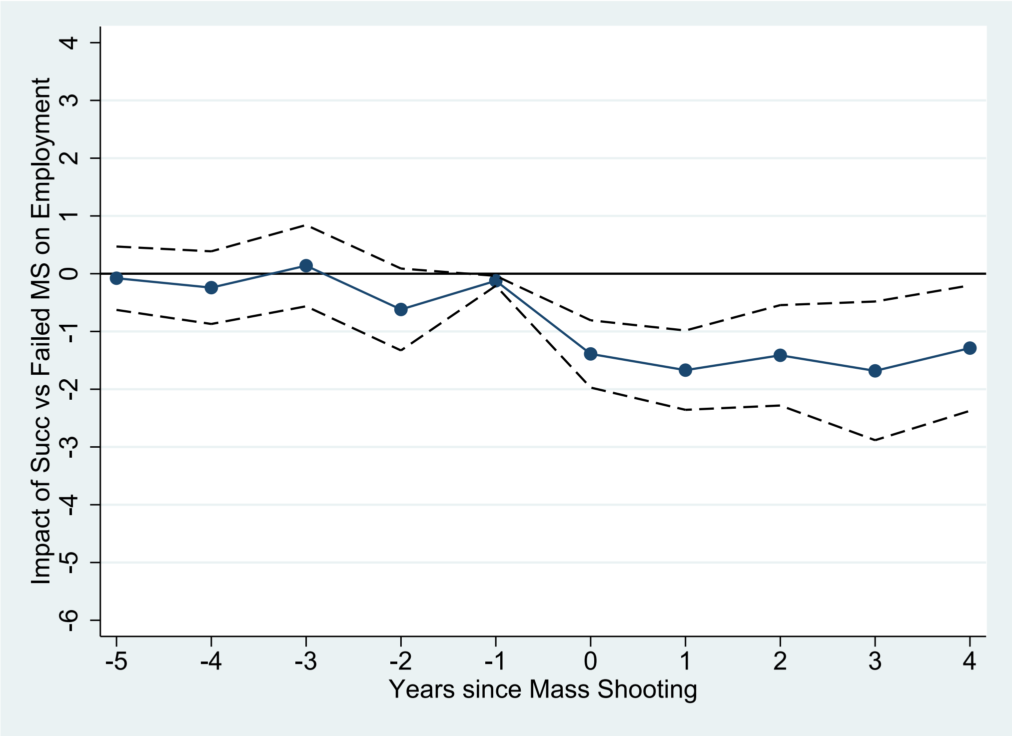
Notes: The Figure shows the result from OLS estimation of Equation 2. The sample is restricted to counties with a successful mass shooting. The figure plots the estimated 100 × the natural logarithm of jobs-to-population ratio in counties targeted by a successful mass shooting at yearly intervals around the shooting.

Figure 3: Impact of Successful Mass Shooting on Earnings



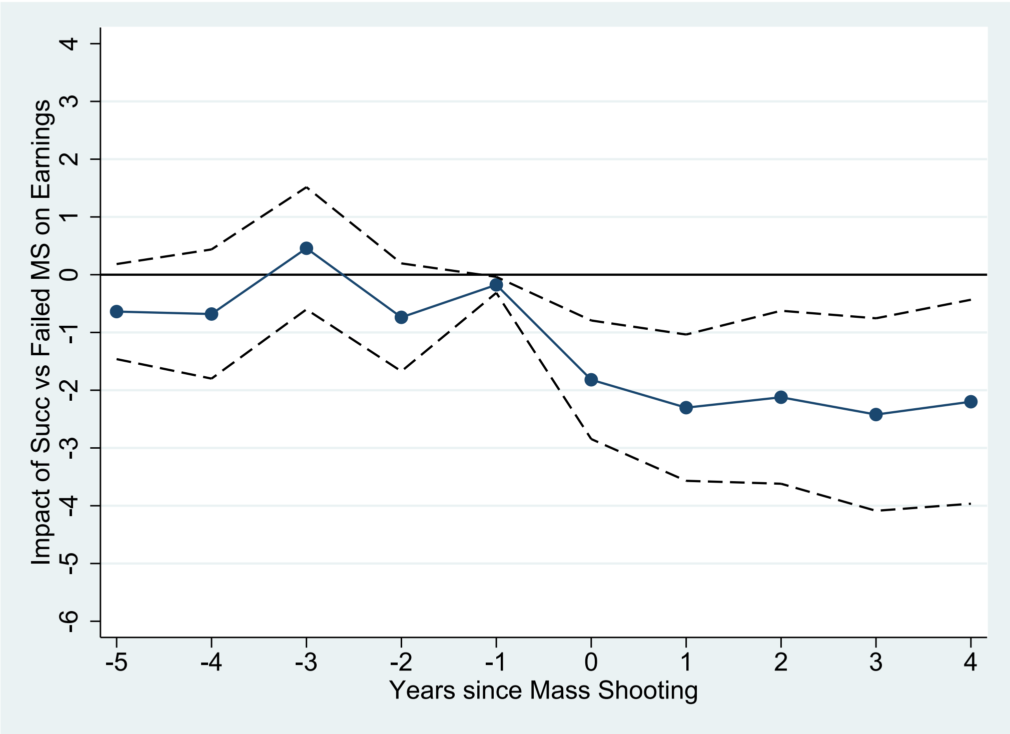
Notes: The Figure shows the result from OLS estimation of Equation 2. The sample is restricted to counties with a successful mass shooting. The figure plots the estimated 100 × the natural logarithm of total real earnings-to-population ratio in counties targeted by a successful mass shooting at yearly intervals around the shooting.

Figure 4: Impact of Successful vs Failed Mass Shooting on Employment



Notes: The Figure shows the result from OLS estimation of Equation 4. The sample is restricted to counties with either a successful or a failed mass shooting. The figure plots the estimated difference in the 100 × the natural logarithm of jobs-to-population ratio in counties targeted by a successful relative to a failed mass shooting at yearly intervals around the shooting.

Figure 5: Impact of Successful vs Failed Mass Shooting on Earnings



Notes: The Figure shows the result from OLS estimation of Equation 4. The sample is restricted to counties with either a successful or a failed mass shooting. The figure plots the estimated difference in the 100 $\times$ the natural total real earnings of jobs-to-population ratio in counties targeted by a successful relative to a failed mass shooting at yearly intervals around the shooting.

Table 1: Descriptive Statistics

Variable	(1) N	(2) Mean	(3) SD	(4) Min	(5) Max
Panel A: All Counties					
100 × Log Jobs per Capita	48,944	-140.32	45.75	-269.94	-46.09
100 × log Total Real Earnings	48,899	46.53	61.75	-118.64	193.49
100 × Log Establishments per Capita	48,944	-381.15	35.35	-593.33	-210.35
House Value Index	5,918	132.47	28.43	69.49	279.93
Log Population	48,944	10.28	1.43	4.74	16.13
Successful Mass Shooting	48,944	0.0036	0.060	0	1
Failed Mass Shooting	48,944	0.0023	0.048	0	1
Panel B: Counties with Successful or Failed Mass Shooting					
100 × Log Jobs per Capita	2,271	-98.44	34.08	-229.01	-46.08
100 × log Total Real Earnings	2,271	112.81	52.32	-32.19	193.49
100 × Log Establishments per Capita	2,271	-371.31	25.61	-477.50	-265.56
House Value Index	1,256	135.28	30.32	69.49	267.65
Log Population	2,271	12.55	1.32	9.10	16.13
Successful Mass Shooting	2,271	0.078	0.269	0	1
Failed Mass Shooting	2,271	0.050	0.218	0	1
Killed in Successful Mass Shooting	178	5.26	3.12	4	32
Killed in Failed Mass Shooting	114	1.29	1.07	0	3

Notes: The Table shows summary statistics for the main variables used in the paper. Columns 1 to 6 show the total number of observations, mean, standard deviation, minimum value, median and maximum value of the variables, respectively. Panel A consists of the entire sample of counties, while Panel B consists of the sample of counties used for the empirical analysis, i.e., counties with a successful or a failed mass shooting, with only county-year observations up to four years after the shooting and six years prior to the shooting are included. Employment, earnings and establishments data is taken from the County Business Patterns. House price index data is taken from the Federal Reserve Bank of St. Louis. The time period is 2000–2015.

Table 2: Socioeconomic Characteristics of Shooters

	All	School Related	Workplace Related	Other Type	
Risk Factors					
Financial Distress	39%	18%	67%	49%	
Family Violence	39%	9%	24%	71%	
Religious/Racial	17%	9%	14%	29%	
Political	4%	0%	14%	2%	
Social Rejection	4%	27%	5%	0%	
School Failure	4%	27%	0%	2%	
Unknown	13%	9%	14%	20%	
	All	School Related	Workplace Related	Other Type	U.S. Census
Employment					
Employed	42%	25%	21%	50%	69%
Student	12%	50%	0%	7%	12%
Unemp. or Out Labor	46%	25%	79%	43%	19%
Schooling					
Some High School	24%	33%	43%	17%	14%
Grad. High School	22%	11%	43%	21%	29%
Some College	33%	56%	14%	31%	24%
Grad. College	20%	0%	0%	31%	32%
Martial Status					
Married/Partner	42%	22%	23%	49%	44%
Divorced/Separated	29%	44%	46%	22%	13%
Single	29%	33%	31%	27%	42%
Child	41%	22%	33%	45%	55%
Race					
White	51%	36%	51%	53%	73%
Black/African Ame.	23%	0%	26%	26%	13%
Other (or Two) Race	26%	74%	23%	21%	14%
Demographics					
Age	34	28	39	33	36
Born U.S.	81%	73%	80%	83%	81%
Male	95%	100%	95%	94%	50%
Mental Illness	43%	73%	47%	37%	5%
Military	19%	9%	14%	22%	10%
Place of Residence	96%	100%	100%	95%	
Total Observations	97	11	21	65	

Notes: We collect socioeconomic characteristics for a total of 97 mass shootings. Mass shootings are defined as shootings leading to at least four deaths, excluding the shooter. Data on age and gender were obtained for all perpetrators. Information on the educational attainment, employment status and marital status were obtained for 45, 74 and 77 perpetrators, respectively. For some mass shootings, multiple risk factors were documented. "Financial Distress" includes being recently fired from job, history of financial difficulties and financial dispute with the victim(s). "School Failure" includes expulsion, suspension or failing classes. "Social Rejection" includes bullying or parents' divorce. The variable "Mental Illness" equals one if the perpetrator had a mental disorder, a history of mental illness or suffered from sever depression. "Military" equals one if the perpetrator was or used to be in the military. Mass shootings classified as "Other & Unknown" include, for instance, gang-related incidents, military-related incidents and misogyny. The last column reports summary statistics from the 2010 American Community Survey for male Americans aged 25–45. Data on metal health comes from the Substance Abuse and Mental Health Services Administration. Data on military is from the Department of Veterans Affairs. Data on fertility is from the Current Population Survey.

Table 3: Predicting Success of a Mass Shooting

	Success (1)	Failed (2)	Difference (3)
100 × Log Jobs per Capita	-99.41	-99.75	-2.03
	(34.83)	(35.24)	(4.18)
100 × log Total Real Earnings	117.31	109.41	-4.23
	(54.24)	(53.23)	(6.53)
100 × Log Establishments per Capita	-373.72	-371.85	-2.67
	(23.93)	(26.53)	(3.23)
House Value Index	133.39	132.43	-6.54
	(33.44)	(30.15)	(4.51)
Log Population	12.88	12.42	-0.02
	(1.43)	(1.29)	(0.17)
Proportion Male	0.49	0.49	0.00
	(0.01)	(0.02)	(0.00)
Log Population 18-65 Years	20.66	19.75	-0.07
	(2.88)	(2.59)	(0.34)
Proportion Completed High School	0.28	0.29	0.01
	(0.06)	(0.07)	(0.01)
Racial Diversity Index	1.12	1.04	0.06
	(0.45)	(0.40)	(0.06)
Proportion Living in Poverty	0.15	0.15	0.01
	(0.04)	(0.05)	(0.01)
Income Inequality Gini	0.45	0.45	0.00
	(0.04)	(0.04)	(0.00)
100000 × Log Violent Crime per Capita	3.37	4.34	0.57
	(3.84)	(4.99)	(0.46)
100000 × Log Property Crime per Capita	4.82	6.30	0.86
	(5.98)	(7.65)	(0.70)
100000 × Log Homicides by Gun per Capita	6.72	4.45	0.99
	(5.16)	(4.77)	(0.72)
100000 × Log Suicides by Gun per Capita	6.77	7.01	-0.24
	(4.04)	(3.91)	(0.45)
Airport - Large Hub	0.13	0.12	0.01
	(0.33)	(0.33)	(0.05)
Airport - Medium Hub	0.13	0.09	0.03
	(0.33)	(0.29)	(0.05)
Coastal County	0.47	0.39	0.07
	(0.50)	(0.49)	(0.07)
State Capitol	0.12	0.07	0.05
	(0.32)	(0.25)	(0.04)
Region Northeast	0.10	0.17	-0.07
	(0.30)	(0.38)	(0.05)
Region Midwest	0.22	0.24	-0.01
	(0.42)	(0.43)	(0.06)
Region South	0.47	0.39	0.08
	(0.50)	(0.49)	(0.07)
Region West	0.21	0.20	0.01
	(0.41)	(0.40)	(0.06)

Notes: The Table shows mean of variables in counties with a successful mass shooting (Column 1) and counties with a failed mass shooting (Column 2). Standard deviations are in parentheses (standard errors for Column 3). Each observation is a county-year cell. All time-varying variables (i.e., from "100 × Log Jobs per Capita" to "100000 × Log Suicides by Gun per Capita") are examined in the year before the mass shooting(s) took place.

Table 4: Predicting Success of a Mass Shooting: Logit Estimation

	Success		
	(1)	(2)	(3)
100 × Log Jobs per Capita	0.016		-0.117
	(0.147)		(0.329)
100 × Log Total Real Earnings		0.038	0.106
		(0.110)	(0.239)
Log Population	0.109	0.070	-0.001
	(0.073)	(0.144)	(0.259)
Proportion Male	-4.190	-4.050	-4.228
	(4.015)	(3.882)	(3.956)
Proportion Completed High School	-0.158	-0.118	-0.079
	(0.983)	(0.991)	(1.032)
Racial Diversity Index	-0.019	-0.013	-0.018
	(0.135)	(0.135)	(0.137)
Proportion Living in Poverty	0.863	0.997	0.999
	(0.941)	(1.049)	(1.051)
Income Inequality Gini	-1.422	-1.567	-1.594
	(1.365)	(1.378)	(1.368)
100000 × Log Violent Crime per Capita	0.043	0.043	0.041
	(0.097)	(0.098)	(0.100)
100000 × Log Property Crime per Capita	0.005	0.006	0.006
	(0.057)	(0.058)	(0.059)
100000 × Log Homicides by Gun per Capita	0.006	0.005	0.005
	(0.010)	(0.010)	(0.010)
100000 × Log Suicides by Gun per Capita	-0.012	-0.011	-0.011
	(0.010)	(0.010)	(0.011)
State Capitol	0.099	0.098	0.102
	(0.109)	(0.109)	(0.108)
Coastal County	0.010	0.012	0.004
	(0.084)	(0.084)	(0.086)
Airport - Large Hub	-0.069	-0.082	-0.086
	(0.129)	(0.131)	(0.133)
Airport - Medium Hub	-0.143	-0.149	-0.147
	(0.123)	(0.120)	(0.121)
Observations	282	282	282
Pseudo R-Squared	0.047	0.047	0.048

Notes: The Table shows results from a logit estimation (marginal effects reported). The sample is restricted to observations one period prior to either a successful or a failed mass shooting. The dependent variable is dummy equal to one for successful mass shooting and zero for failed mass shootings. The standard errors are clustered at the county level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table 5: Impact of Successful Mass Shootings on Employment and Earnings

	Log Jobs per Capita			Log Earnings per Capita		
	(1)	(2)	(3)	(4)	(5)	(6)
Success (t - 5)	0.269	0.121	-0.039	-0.054	-0.319	-0.443
	(0.309)	(0.327)	(0.341)	(0.460)	(0.401)	(0.399)
Success (t - 4)	0.014	0.085	-0.064	-0.288	-0.209	-0.225
	(0.335)	(0.362)	(0.349)	(0.618)	(0.653)	(0.636)
Success (t - 3)	0.316	0.360	0.143	0.762	1.027	0.949
	(0.462)	(0.432)	(0.401)	(0.640)	(0.636)	(0.607)
Success (t - 2)	-0.473	-0.333	-0.424	-0.507	-0.096	-0.246
	(0.520)	(0.446)	(0.429)	(0.662)	(0.616)	(0.632)
Success	-1.417**	-1.042**	-0.983**	-2.031*	-1.443**	-1.196*
	(0.700)	(0.422)	(0.401)	(1.086)	(0.656)	(0.637)
Success (t + 1)	-1.802**	-1.679***	-1.504***	-2.818**	-2.498***	-2.011**
	(0.717)	(0.514)	(0.536)	(1.261)	(0.837)	(0.862)
Success (t + 2)	-1.788**	-1.340**	-1.105	-2.981**	-2.021*	-1.491
	(0.778)	(0.622)	(0.701)	(1.344)	(1.016)	(1.105)
Success (t + 3)	-2.223***	-1.739**	-1.360	-3.498***	-2.259*	-1.490
	(0.760)	(0.821)	(0.926)	(1.232)	(1.124)	(1.279)
Success (t + 4)	-1.761**	-1.410**	-0.867	-3.355***	-2.116*	-1.314
	(0.665)	(0.666)	(0.803)	(1.208)	(1.197)	(1.394)
Observations	1,464	1,464	1,464	1,464	1,464	1,464
R-squared	0.990	0.993	0.994	0.990	0.993	0.994
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	Yes	Yes	No	Yes	Yes
Region × Year FE	No	No	Yes	No	No	Yes
Month × Year FE	No	Yes	Yes	No	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 2. The sample is restricted to counties with a successful mass shooting. Only county-year observations up to four years after the successful shooting and six years prior to the successful shooting are included. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (Columns 1–3) and 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (Columns 4–6), respectively. The main independent variables are leads and lags of "Success," which are dummy variables equal to one if the county had a successful mass shooting in year t and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. Employment and earnings data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table 6: Impact of Successful vs Failed Mass Shootings on Employment, Earnings and Establishments

Panel A	100 × Log Jobs per Capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Post Shooting	0.467	1.250	1.557	1.558	1.100	0.402
	(1.136)	(1.218)	(1.142)	(1.140)	(1.050)	(1.255)
Success		-1.825***	-1.992***	-1.997***	-1.723***	-1.730***
		(0.616)	(0.521)	(0.520)	(0.495)	(0.529)
R-Squared	0.989	0.989	0.991	0.991	0.992	0.993
Panel B	100 × Log Real Earnings per Capita					
Post Shooting	1.926	3.138*	3.866**	3.867**	3.463**	1.870
	(1.658)	(1.799)	(1.848)	(1.849)	(1.683)	(1.530)
Success		-2.820***	-2.953***	-2.955***	-2.785***	-2.623***
		(0.925)	(0.787)	(0.788)	(0.795)	(0.875)
R-Squared	0.990	0.990	0.992	0.992	0.993	0.993
Panel C	100 × Log Business Establishments per Capita					
Post Shooting	0.295	0.888	1.034	1.035	0.904	1.239
	(0.970)	(1.024)	(0.911)	(0.911)	(0.912)	(0.852)
Success		-1.382***	-1.260***	-1.263***	-1.114***	-1.131***
		(0.424)	(0.351)	(0.348)	(0.299)	(0.292)
R-Squared	0.991	0.991	0.993	0.993	0.994	0.994
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	No	Yes	Yes	Yes	Yes
Law Enforcement	No	No	No	Yes	Yes	Yes
Region × Year FE	No	No	No	No	Yes	No
Division × Year FE	No	No	No	No	No	Yes
Month × Year FE	No	No	Yes	Yes	Yes	Yes
Observations	2,271	2,271	2,271	2,271	2,271	2,271

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (panel A), 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (panel B) and 100 × the natural logarithm of the ratio of business establishments to population (panel C), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. Columns 4–6 include a dummy for whether the shooting ended because of law enforcement intervention. Employment, earnings and establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table 7: Impact of Successful vs Failed Mass Shootings on Housing Prices

	100 × Log House Price Index					
	(1)	(2)	(3)	(4)	(5)	(6)
Post Shooting	1.565	4.352	7.520*	7.530*	6.796**	4.394*
	(3.407)	(3.836)	(4.282)	(4.275)	(2.809)	(2.484)
Success		-5.436**	-3.246	-3.262	-3.173**	-2.807**
		(2.034)	(1.971)	(1.973)	(1.341)	(1.314)
Observations	1,256	1,256	1,256	1,256	1,256	1,256
R-squared	0.792	0.798	0.871	0.871	0.910	0.928
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	No	Yes	Yes	Yes	Yes
Law Enforcement	No	No	No	Yes	Yes	Yes
Region × Year FE	No	No	No	No	Yes	No
Division × Year FE	No	No	No	No	No	Yes

Notes: The table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The main dependent variable is the natural logarithm of the county housing price index. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. Columns 4–6 include a dummy for whether the shooting ended because of law enforcement intervention. House price index data is taken from the Federal Reserve Bank of St. Louis. The time period is 2000–2015. The standard errors are clustered at the state level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table 8: Impact of Successful vs Failed Mass Shootings on Consumer Sentiment

	Personal Finance Worse Now (1)	Business Conditions Worse Now (2)	Personal Finance Worse Future (3)	Bad Time Buy Major HH Items (4)
Post Shooting	-0.095	-0.064***	-0.040	-0.070**
	(0.063)	(0.023)	(0.052)	(0.028)
Success	0.052**	0.049*	-0.027	0.015
	(0.025)	(0.028)	(0.024)	(0.020)
Observations	4,309	4,286	4,195	4,087
R-squared	0.215	0.338	0.183	0.245
Individual Controls	Yes	Yes	Yes	Yes
County FE	Yes	Yes	Yes	Yes
Region × Month FE	Yes	Yes	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 5. The sample is restricted to counties with either a successful or failed mass shooting. We rely on 12 months of observations pre- and 12 months of observations post-shooting. In Column 1, the dependent variable is based on answers to the question: "We are interested in how people are getting along financially these days. Would you say that you are better off or worse off financially than you were a year ago?" The dependent variable is equal to one if respondents report "Worse" and zero otherwise. In Column 2, the dependent variable is based on answers to the question: "Would you say that at the present time business conditions are better or worse than they were a year ago?" The dependent variable is equal to one if respondents report "Worse now" and zero otherwise. In Column 3, the dependent variable is based on answers to the question: "Now looking ahead–do you think that a year from now you will be better off financially, or worse off, or just about the same as now?" The dependent variable is equal to one if respondents report "Will be worse off" and zero otherwise. In Column 4, the dependent variable is based on answers to the question: "About the big things people buy for their homes–such as furniture, a refrigerator, stove, television, and things like that. Generally speaking, do you think now is a good or a bad time for people to buy major household items?" The dependent variable is equal to one if respondents report "Bad" and zero otherwise. The main independent variable is "Success," which is equal to one after a successful mass shooting and zero otherwise. The survey data is taken from the Michigan Survey of Consumers. Individual controls include age, age squared, gender, four education dummies and four marital status dummies. The time period is 2000–2012. Household head sampling weights are used. The standard errors are clustered at the state-level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table 9: Impact of Successful vs Failed Mass Shootings on Poor Health

	Health Keep you from Doing Usual Activities		
	(1)	(2)	(3)
Post Shooting	-0.341*	0.084	0.098
	(0.182)	(0.121)	(0.123)
Success	0.248*	0.111*	0.120***
	(0.130)	(0.059)	(0.028)
Observations	27,030	53,646	64,425
Individual Controls	Yes	Yes	Yes
County FE	Yes	Yes	Yes
Year × Month FE	Yes	Yes	Yes
Years in Pre Period	1	3	5
Years in Post Period	1	3	5

Notes: The Table shows results from Poisson estimation of Equation 5. The sample is restricted to counties with either a successful or failed mass shooting. We exclude respondents who are more than 65 years old and respondents who report being disabled, homemaker, retired or student. In Column 1, we rely on 12 months of observations pre- and 12 months of observations post-shooting. Column 2 restricts the sample to 36 months of observations pre- and 36 months of observations post-shooting. In Column 3, we rely on 60 months of observations pre- and 60 months of observations post-shooting. The dependent variable is based on answers to the question: "During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?" The main independent variable is "Success," which is equal to one after a successful mass shooting and zero otherwise. The survey data is taken from the Behavioral Risk Factor Surveillance System. Individual controls include age, age squared, gender, four education dummies and five marital status dummies. The time period is 2000–2012. Individual sampling weights are used. The standard errors are clustered at the state-level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table 10: Media Coverage of Successful vs Failed Mass Shootings

	Any Mass Shootings News Story			
Panel A	All	ABC	CBS	NBC
	(1)	(2)	(3)	(4)
Success	0.144*	0.179**	0.132	0.148
	(0.086)	(0.078)	(0.099)	(0.090)
ln(City News Stories)	-0.002	-0.009	-0.002	0.001
	(0.024)	(0.027)	(0.026)	(0.024)
R-Squared	0.543	0.579	0.535	0.517
	log(Number of News Stories)			
Panel B	All	ABC	CBS	NBC
Success	0.576**	0.479***	0.340*	0.349*
	(0.225)	(0.163)	(0.178)	(0.173)
ln(City News Stories)	-0.013	-0.015	0.004	-0.010
	(0.060)	(0.043)	(0.039)	(0.036)
R-Squared	0.568	0.568	0.582	0.520
	log(Duration of News Stories)			
Panel C	All	ABC	CBS	NBC
Success	0.598*	0.602**	0.333	0.374
	(0.302)	(0.243)	(0.223)	(0.269)
ln(City News Stories)	-0.030	-0.038	0.017	-0.000
	(0.102)	(0.072)	(0.071)	(0.078)
R-Squared	0.634	0.642	0.624	0.606
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Shooting Controls	Yes	Yes	Yes	Yes
Observations	292	292	292	292

Notes: The Table shows results from an OLS estimation of Equation 6. The sample is restricted to the year of shooting for counties with either a successful or failed mass shooting. The dependent variables are a dummy equal to one if the mass shooting received a news story and zero otherwise (Panel A), the natural logarithm of the number of news stories that the mass shooting received (Panel B), and the natural logarithm of the total number of minutes of news coverage that the mass shooting received (Panel C), respectively. The main independent variable is "Success," which is equal to one after a successful mass shooting and zero otherwise. The variable "ln(City News Stories)" is the natural logarithm of the number of news stories about the city where the shooting took place. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. News coverage data is collected from the Vanderbilt Television News Archive. The time period is 2000–2015. The standard errors are clustered at the county level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table 11: Impact of Media Coverage of Shootings on Employment, Earnings and Establishments

Panel A	Δ 100 × Log Employment per Capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Number of News Stories	-0.039	-0.356**	-0.396**			
	(0.043)	(0.150)	(0.178)			
Duration of News Stories				0.005	-0.114**	-0.130**
				(0.024)	(0.051)	(0.063)
ln(City News Stories)	1.696	1.051	1.005	1.777	1.731	1.768
	(1.457)	(1.214)	(1.254)	(1.429)	(1.283)	(1.346)
Shooting Victims	0.097	0.188	0.198	0.082	0.178	0.189
	(0.258)	(0.193)	(0.197)	(0.266)	(0.210)	(0.217)
Disaster Total Affected			-13.773			-16.968
			(13.866)			(17.476)
R-Squared	0.764	0.701	0.691	0.763	0.639	0.615
Panel B	Δ 100 × Log Real Earnings per Capita					
Number of News Stories	-0.033	-0.660**	-0.726**			
	(0.087)	(0.308)	(0.344)			
Duration of News Stories				0.013	-0.212**	-0.247*
				(0.037)	(0.106)	(0.129)
ln(City News Stories)	3.648*	2.374	2.353	3.721*	3.633**	3.716*
	(1.964)	(1.522)	(1.560)	(1.996)	(1.833)	(1.979)
Shooting Victims	0.189	0.368	0.386	0.169	0.349	0.374
	(0.511)	(0.396)	(0.383)	(0.517)	(0.424)	(0.441)
Disaster Total Affected			-30.864			-37.920
			(29.074)			(37.346)
R-Squared	0.695	0.603	0.596	0.696	0.529	0.493
Estimation	OLS	IV	IV	OLS	IV	IV
State FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Division × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	176	176	176	176	176	176
Montiel-Pflueger F Stat	–	10.149	8.645	–	6.778	5.460

Notes: The table shows results from an OLS and IV estimation of Equation 7. The sample is restricted to counties with a successful mass shooting. Only county-year observation in the year of the shooting are included. The dependent variables are the change in 100 × the natural logarithm of ratio of jobs to population (Panel A) and the change in 100 × the natural logarithm of ratio of total real earnings to population (Panel B). The main independent variables are the number of news stories that the mass shooting received (Number of news stories), and the total number of minutes of news coverage that the mass shooting received (Duration of news stories). Columns 1 and 4 show the results obtained using OLS, while Columns 2, 3, 5, and 6 show the results obtained using IV estimation. Media coverage in Columns 2, 3, 5, and 6 is instrumented with a dummy variable equal to one if there was a natural disaster in the U.S. on the exact date of the shooting and zero otherwise. Montiel-Pflueger F Statistic are reported in the last row. The variable "ln(city news stories)" is the natural logarithm of the number of news stories about the city where shooting takes place. The variable "Shooting Victims" counts the number of individuals (not including the shooter(s)) killed in the shooting and "Disaster Total Affected" is the total number of people affected by the natural disaster. News coverage data is collected from the Vanderbilt Television News Archive. Natural disasters data is collected from the Emergency Disaster Database (EM-DAT). The time period is 2000–2015. The standard errors are clustered at the county level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

7 Appendix

(NOT FOR PUBLICATION)

7.1 Examples of Failed Mass Shootings

1. On October 31, 2015, at 8:55 a.m., Noah Jacob Harpham, 33, armed with two handguns and a rifle, began shooting people as he walked down the street in a Colorado Springs, Colorado, neighborhood. Three people were killed; no one was wounded. The shooter was killed during an exchange of gunfire with law enforcement.

2. On July 23, 2015, at 7:15 p.m., John Russell Houser, 59, armed with a handgun, began shooting moviegoers in the Grand 16 Theatre in Lafayette, Louisiana. Two people were killed; 9 were wounded. The shooter committed suicide after law enforcement arrived.

3. On May 26, 2015, at 1:00 a.m., Marcell Travon Willis, 21, an active-duty U.S. airman, armed with a handgun, began shooting at a Walmart Supercenter in Grand Forks, North Dakota. One store employee was killed; 1 store employee was wounded. The shooter committed suicide before law enforcement arrived.

4. On May 3, 2015, at 7:30 p.m., Sergio Daniel Valencia Del Toro, 27, armed with two handguns, began shooting into a crowd of people on the Trestle Trail Bridge in Menasha, Wisconsin. Three people were killed; 1 was wounded. The shooter shot himself before law enforcement arrived at the scene and died a few hours later.

5. On April 19, 2015, at 11:50 p.m., Everardo Custodio, 21, armed with a handgun, began shooting into a crowd of people on North Milwaukee Avenue in Chicago, Illinois. No one was killed or wounded. A citizen with a valid firearms permit shot the suspect and restrained him until law enforcement arrived and took him into custody.

6. On March 14, 2015, at 2:00 a.m., Richard Castilleja, 29, armed with a handgun, began shooting in the parking lot of Dad's Sing Along Club in San Antonio, Texas. After being ejected from the club earlier in the evening, the shooter returned and shot at bar patrons as they left the club. No one was killed; 2 were wounded. Law enforcement killed the shooter without an exchange of gunfire.

7. On February 12, 2015, at 2:00 p.m., Jeffrey Scott DeZeeuw, 51, armed with a handgun, began shooting coworkers at a steel mill in Lennox, South Dakota. One coworker was killed; 2 were wounded, including 1 who tried to intervene. The shooter fled the scene and committed suicide at another location.

7.2 Examples of Successful Mass Shootings

1. On October 1, 2015, at 10:38 a.m., Christopher Sean Harper-Mercer, 26, armed with several handguns and a rifle, began shooting classmates in a classroom on the campus of Umpqua Community College in Roseburg, Oregon. Nine people were killed; 7 were wounded. The shooter committed suicide after being wounded during an exchange of gunfire with law enforcement.

2. On September 27, 2012, at 4:35 p.m., Andrew John Engeldinger, 36, armed with a handgun, began shooting in the Accent Signage Systems facility in Minneapolis, Minnesota. The shooter had just been fired from the company. Six people were killed; two were wounded. The shooter committed suicide before police arrived.

3. On May 30, 2012, at 10:52 a.m., Ian Lee Stawicki, 40, armed with two handguns, began shooting inside Cafe Racer in Seattle, Washington, where he had been banned from entering because of previous incidents. He then fled to a parking lot, where he killed a woman to steal her car. Five people were killed; no one was wounded. The shooter committed suicide at another location.

4. On September 6, 2011, at 8:58 a.m., Eduardo Sencion, aka Eduardo Perez-Gonzalez, 32, armed with a rifle, began shooting in an International House of Pancakes in Carson City, Nevada. In total, four people were killed; seven were wounded. The shooter committed suicide before police arrived.

5. On August 3, 2010, at 7:00 a.m., Omar Sheriff Thornton, 34, armed with two handguns, began shooting at his co-workers in the Hartford Beer Distribution Center in Manchester, Connecticut. He had been asked to quit for stealing beer from the warehouse. Eight people were killed; two were wounded. The shooter committed suicide after police arrived.

6. On June 6, 2010, at 10:00 p.m., Gerardo Regalado, 37, armed with a handgun, began shooting in Yoyito Cafe in Hialeah, Florida, where his estranged wife was employed. Four people were killed, including his estranged wife; three were wounded. The shooter fled the scene and committed suicide several blocks away.

7. On December 5, 2007, at 1:42 p.m., Robert Arthur Hawkins, 19, armed with a rifle, began shooting as he exited the elevator on the third floor of the Von Maur department store in the Westroads Mall in Omaha, Nebraska. Eight people were killed; four were wounded. The shooter committed suicide before police arrived.

7.3 Right-to-Carry Concealed Handgun Laws

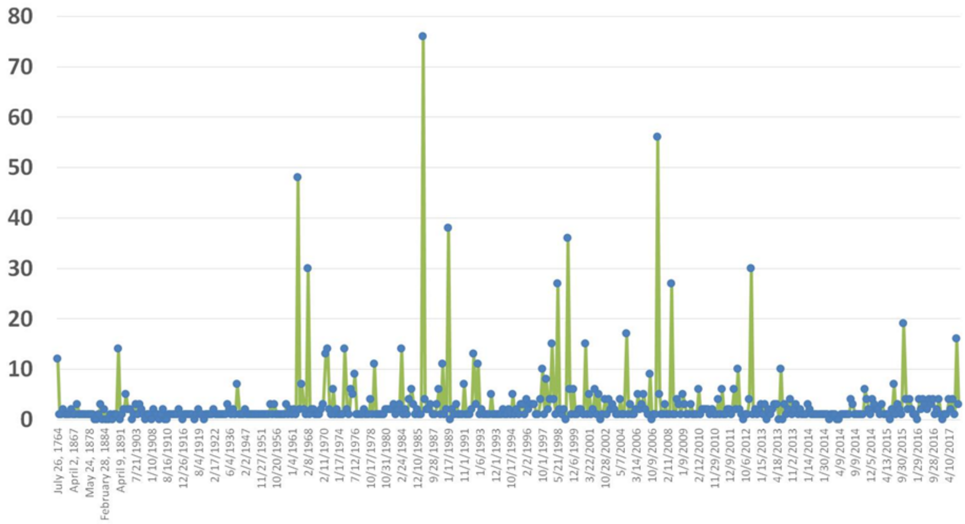
In Appendix Table A26, we investigate whether there are differences in the socioeconomic characteristics of mass shooters for shootings which occurred in states that had adopted an right-to-carry (RTC) concealed handgun law (i.e., RTC states) in comparison to shootings which occurred in a stated which had not adopted an RTC law (i.e., non-RTC states). We obtain right-to-carry adoption dates from Donohue et al. (2019). As of January 2000 (2015), twenty (nine) states did not have a RTC law.[27]

In our sample, 69 of the 97 mass shootings occurred in states that had adopted an RTC law. Column 1 reports summary statistics for the whole sample (i.e., 97 perpetrators of mass shootings), while Columns 2 and 3 restrict the sample to RTC and non-RTC states, respectively. Mass shootings in RTC states are slightly more likely to target schools than in non-RTC states. About 21% of shootings are work-related in both subsamples.

The socioeconomic characteristics of perpetrators are quite similar in both subsamples. One major difference is for the education attainment; perpetrators in RTC states are much more likely to have attended or completed college than in non-RTC states. They are also slightly less likely to be unemployed or out of the labor force at the moment of the shooting. Nonetheless, we find that about 46% of perpetrators were in financial distress at the moment of the shooting in non-RTC states in comparison to only 36% in RTC states.

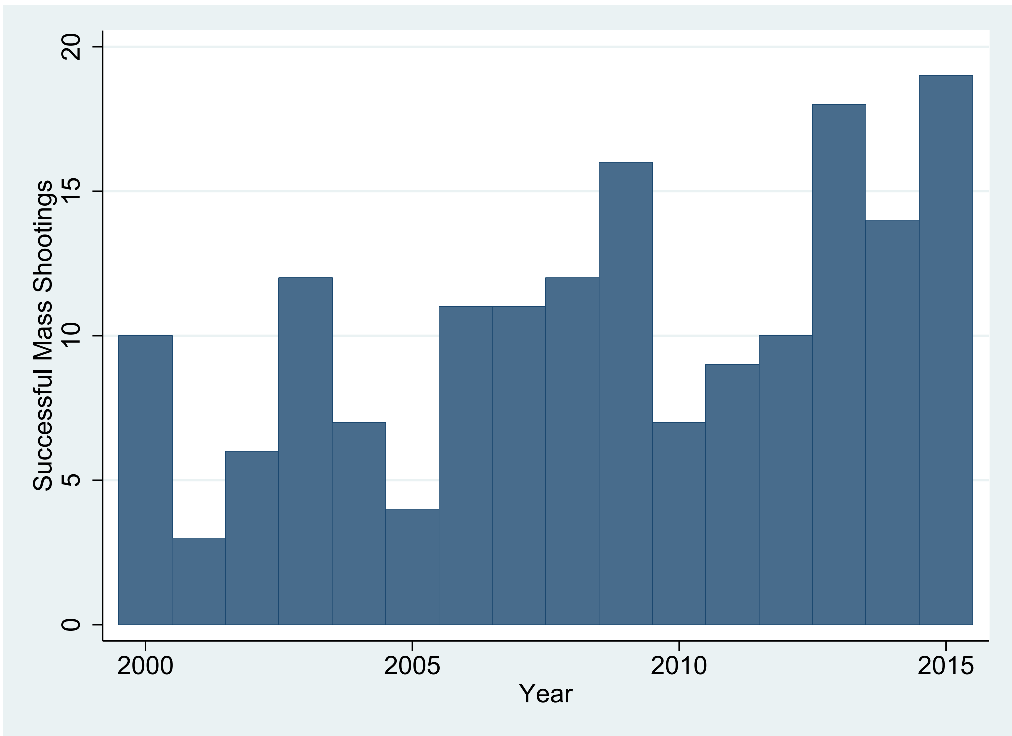
[27] As of January 2015, only the following states did not have a RTC law: California, Delaware, District of Columbia, Hawaii, Massachusetts, Maryland, New Jersey, New York and Rhode Island.

Figure A1: Deaths by school shootings 1764 to 2017



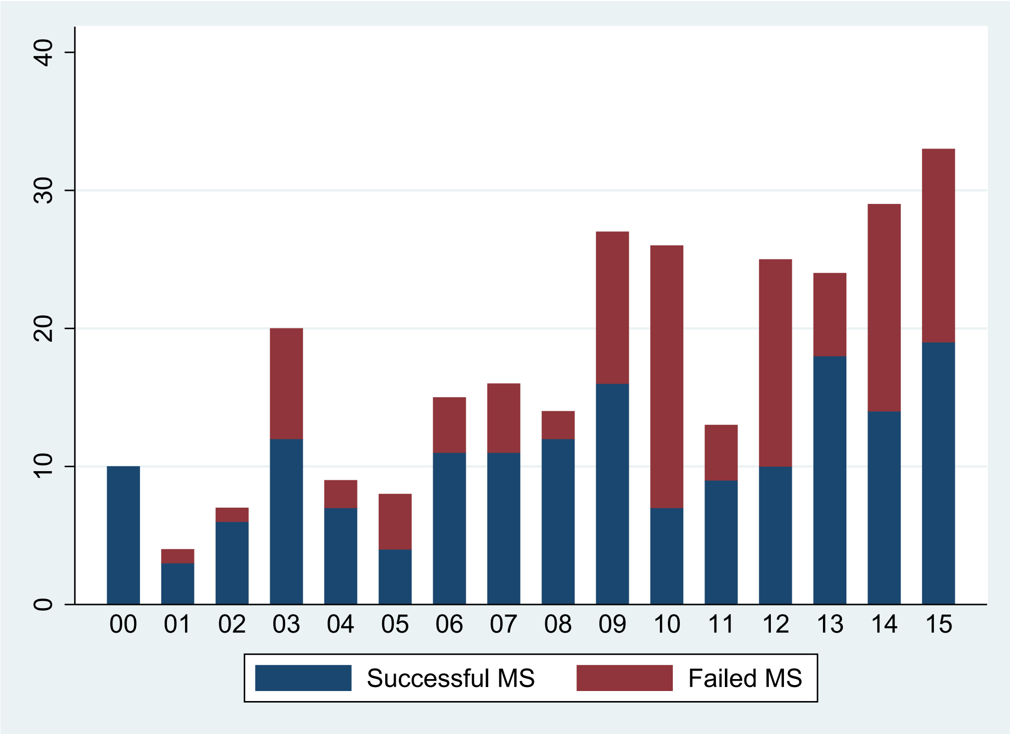
Notes: This Figure shows the number of casualties and injured people caused by school shootings in the U.S. from 1764 to 2017. Computed by Polachek (2018).

Figure A2: Number of Failed Mass Shootings Over Time



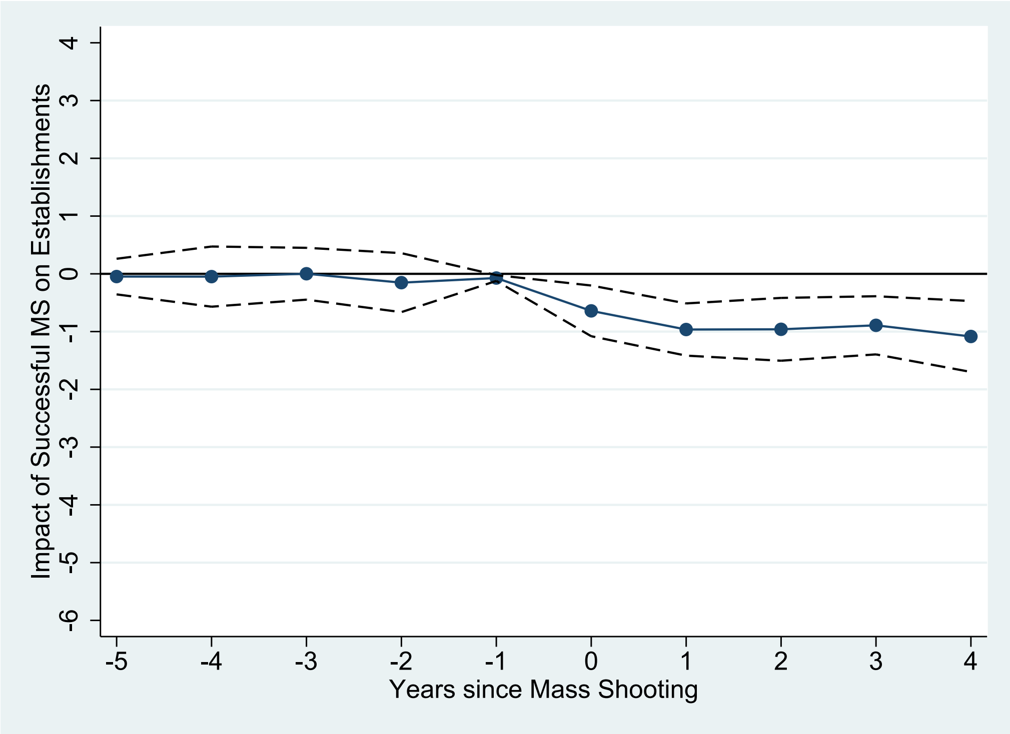
Notes: The Figure plots the number of failed mass shootings from 2000 to 2015.

Figure A3: Number of Successful and Failed Mass Shootings Over Time



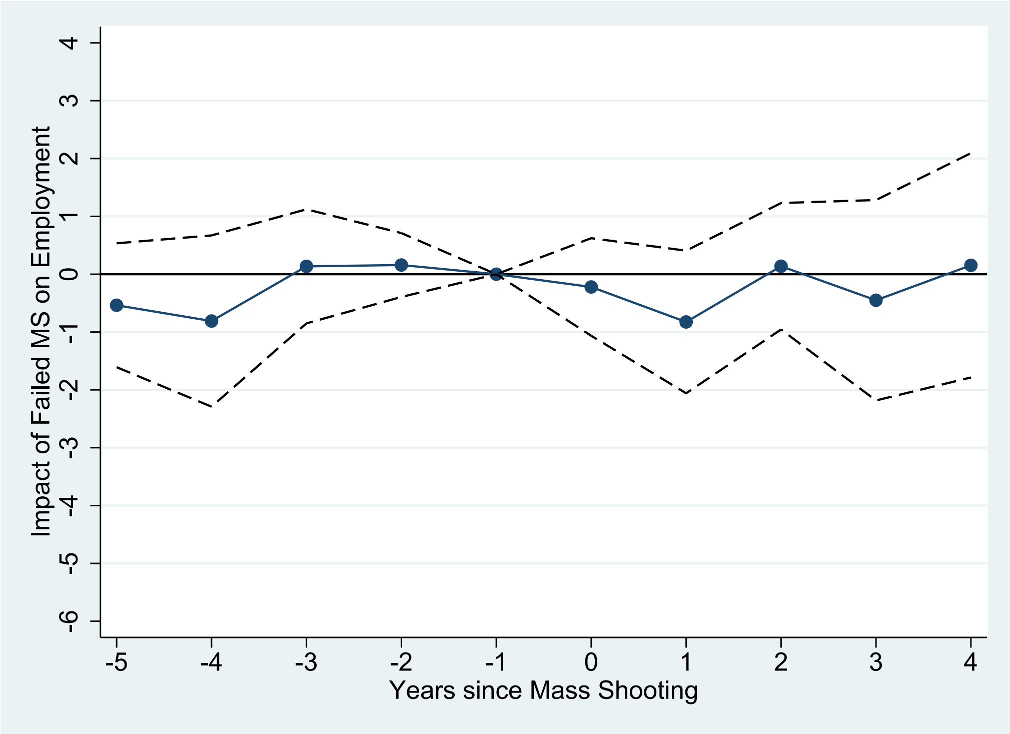
Notes: The Figure plots the number of successful and failed mass shootings from 2000 to 2015.

Figure A4: Impact of Successful Mass Shooting on Establishments



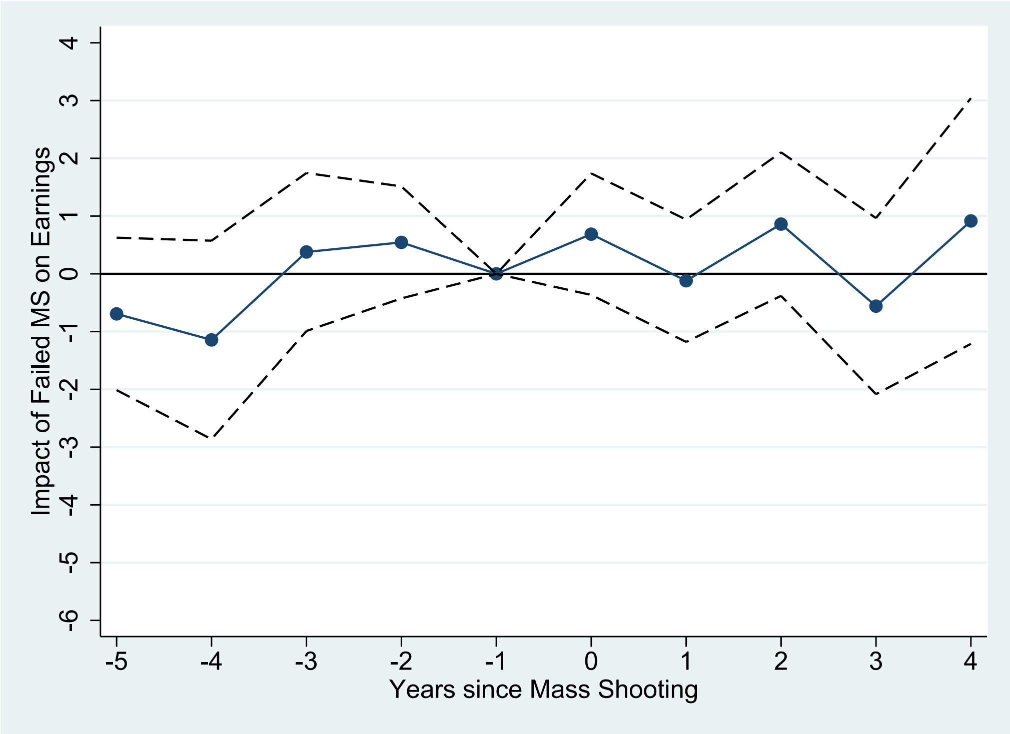
Notes: The Figure shows the result from OLS estimation of Equation 2. The sample is restricted to counties with a successful mass shooting. The figure plots the estimated 100 × the natural logarithm of business establishments-to-population ratio in counties targeted by a successful mass shooting at yearly intervals around the shooting.

Figure A5: Impact of Failed Mass Shooting on Employment



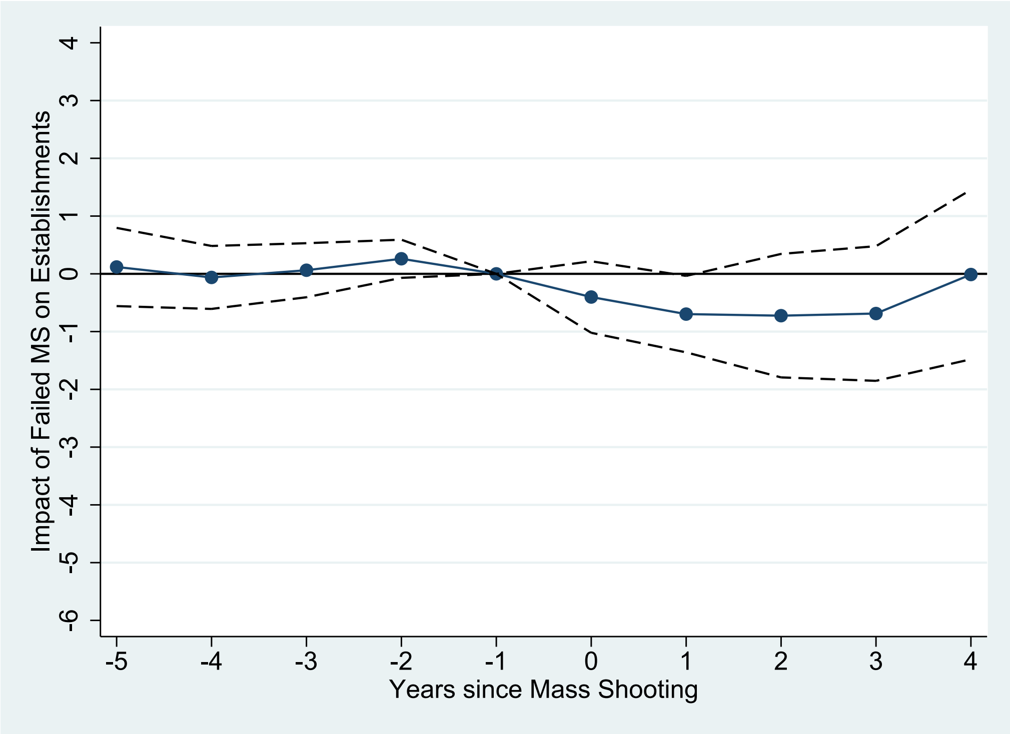
Notes: The Figure shows the result from OLS estimation of Equation 2. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 × the natural logarithm of jobs-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A6: Impact of Failed Mass Shooting on Earnings



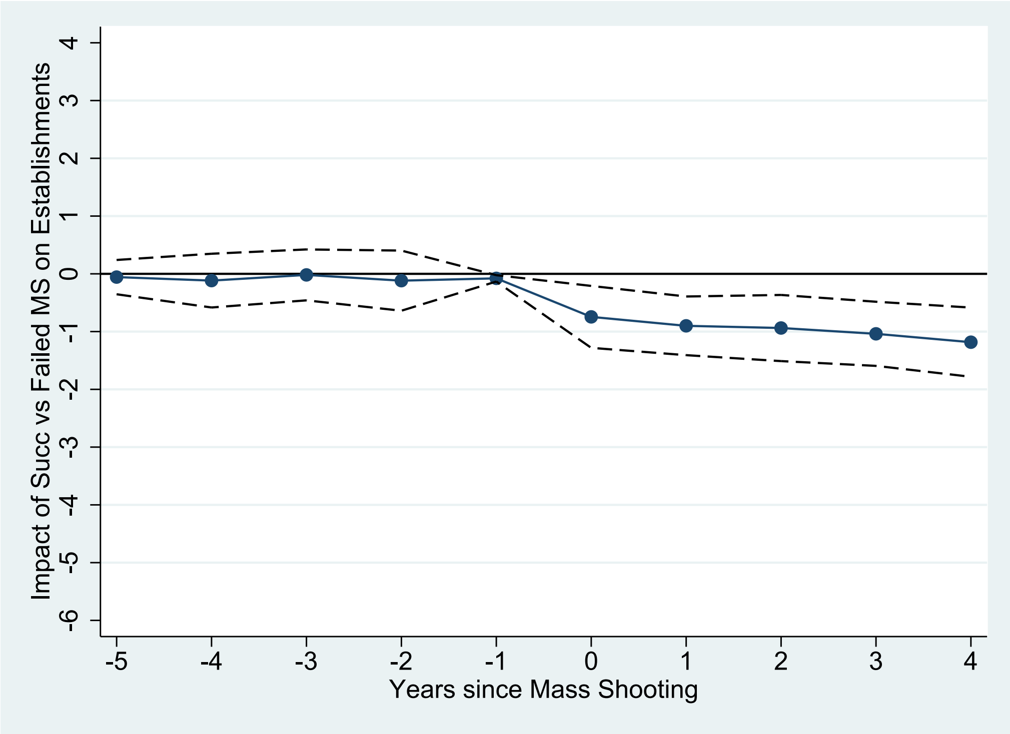
Notes: The Figure shows the result from OLS estimation of Equation 2. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 $\times$ the natural logarithm of total real earnings-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A7: Impact of Failed Mass Shooting on Establishments



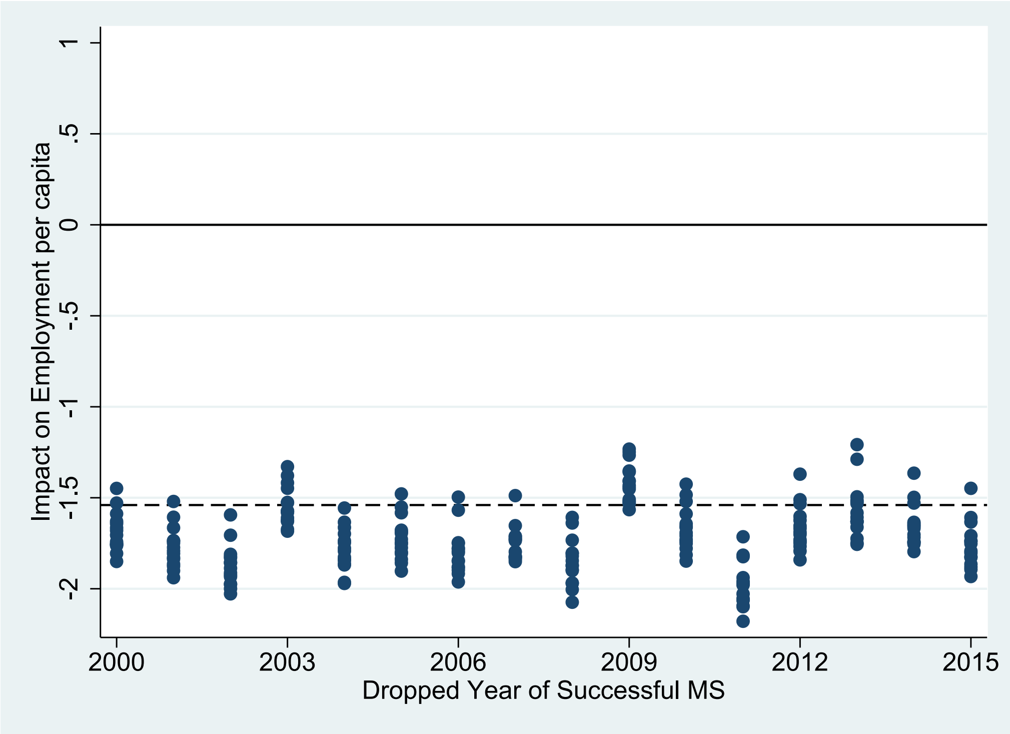
Notes: The Figure shows the result from OLS estimation of Equation 2. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 × the natural logarithm of business establishments-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A8: Impact of Successful vs Failed Mass Shooting on Establishments



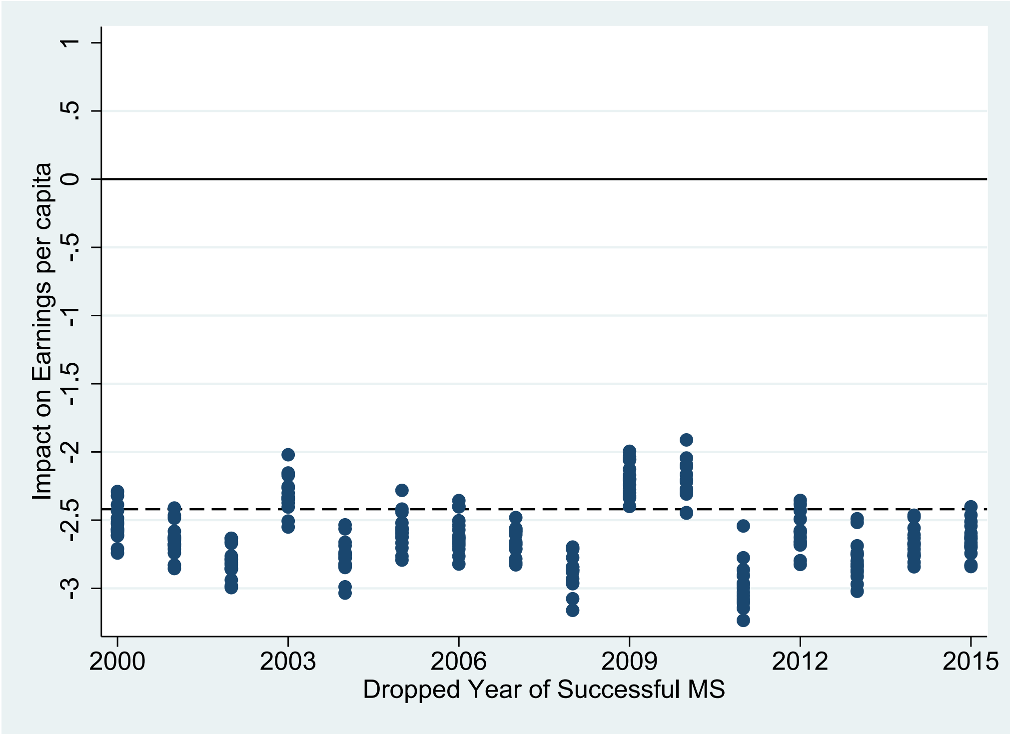
Notes: The Figure shows the result from OLS estimation of Equation 4. The sample is restricted to counties with either a successful or a failed mass shooting. The figure plots the estimated difference in the 100 × the natural logarithm of business establishments-to-population ratio in counties targeted by a successful relative to a failed mass shooting at yearly intervals around the shooting.

Figure A9: Impact of Successful vs Failed Mass Shooting on Employment



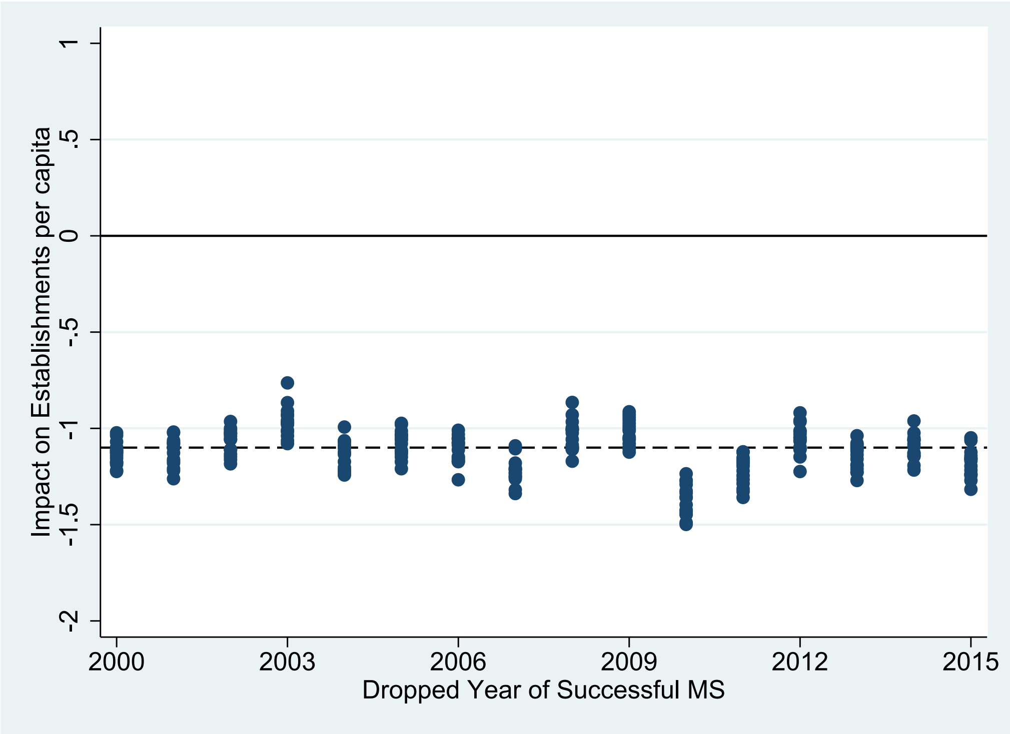
Notes: The Figure shows the result from OLS estimation of Equation 3. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 × the natural logarithm of business establishments-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A10: Impact of Successful vs Failed Mass Shooting on Earnings



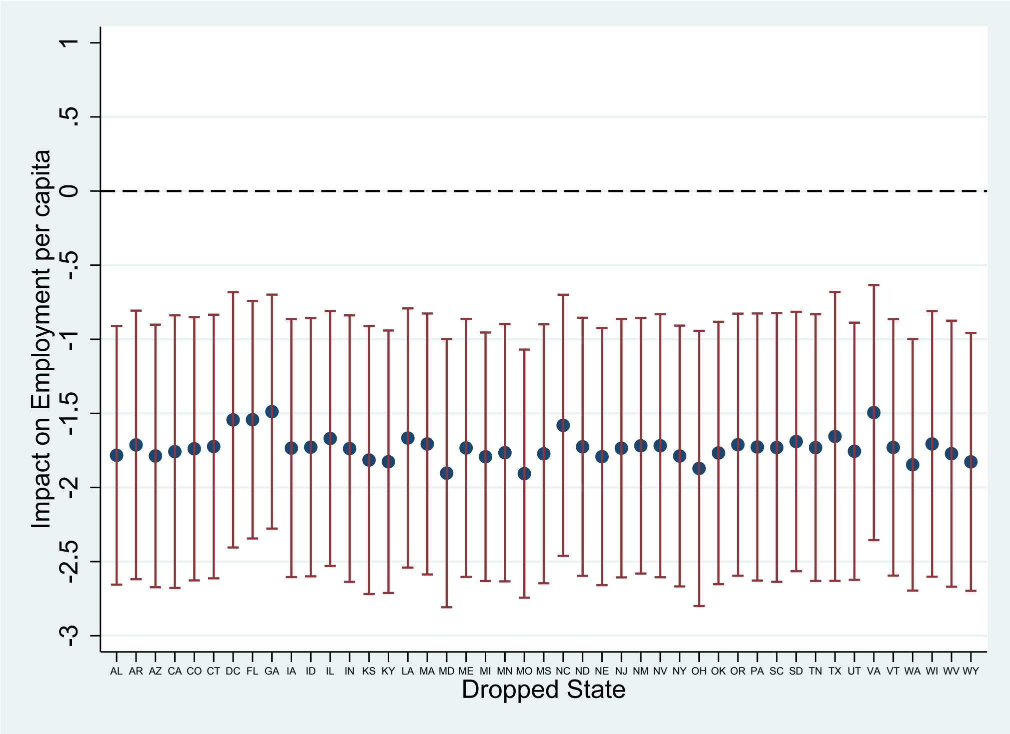
Notes: The Figure shows the result from OLS estimation of Equation 3. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 × the natural logarithm of business establishments-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A11: Impact of Successful vs Failed Mass Shooting on Establishments



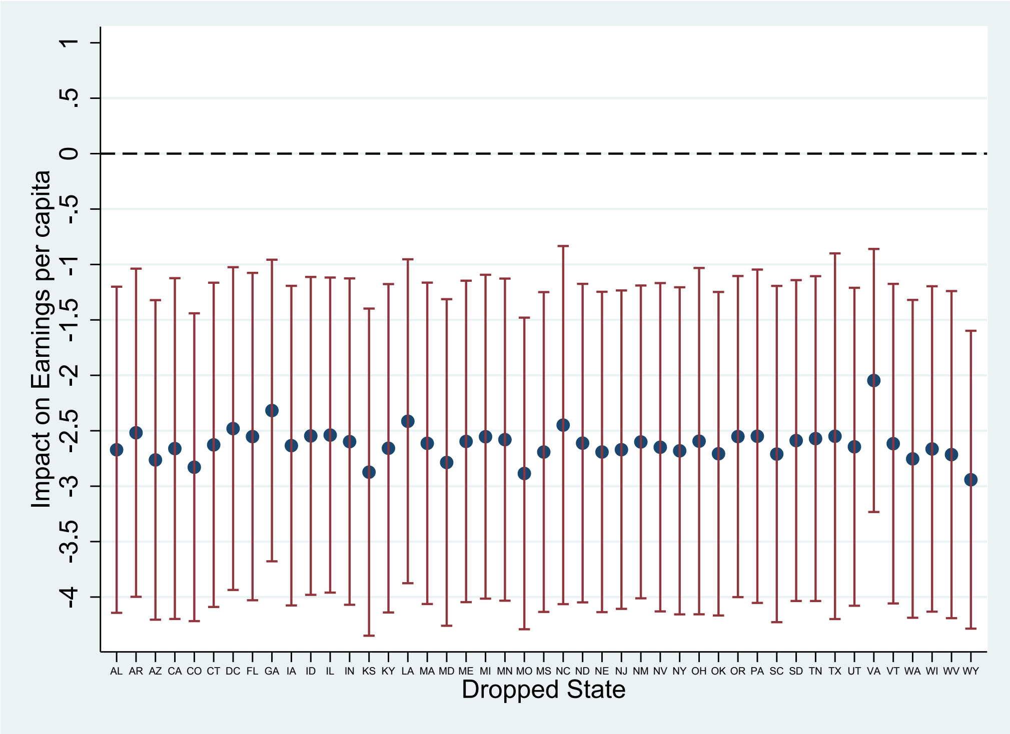
Notes: The Figure shows the result from OLS estimation of Equation 3. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 $\times$ the natural logarithm of business establishments-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A12: Impact of Successful vs Failed Mass Shooting on Employment



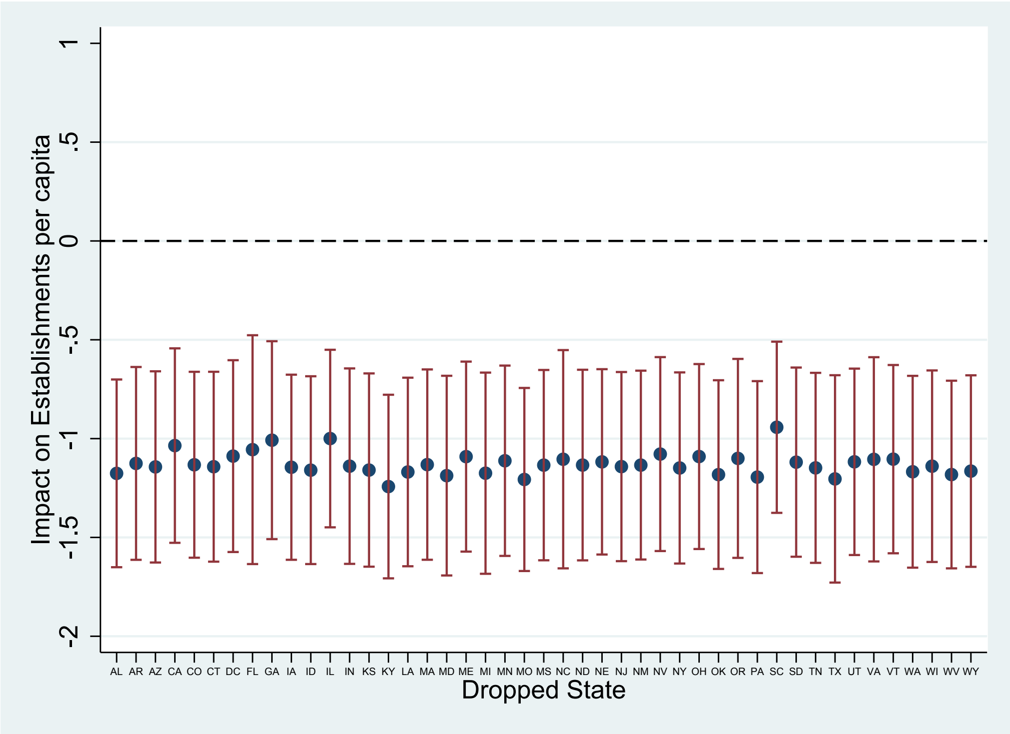
Notes: The Figure shows the result from OLS estimation of Equation 3. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 × the natural logarithm of business establishments-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A13: Impact of Successful vs Failed Mass Shooting on Earnings



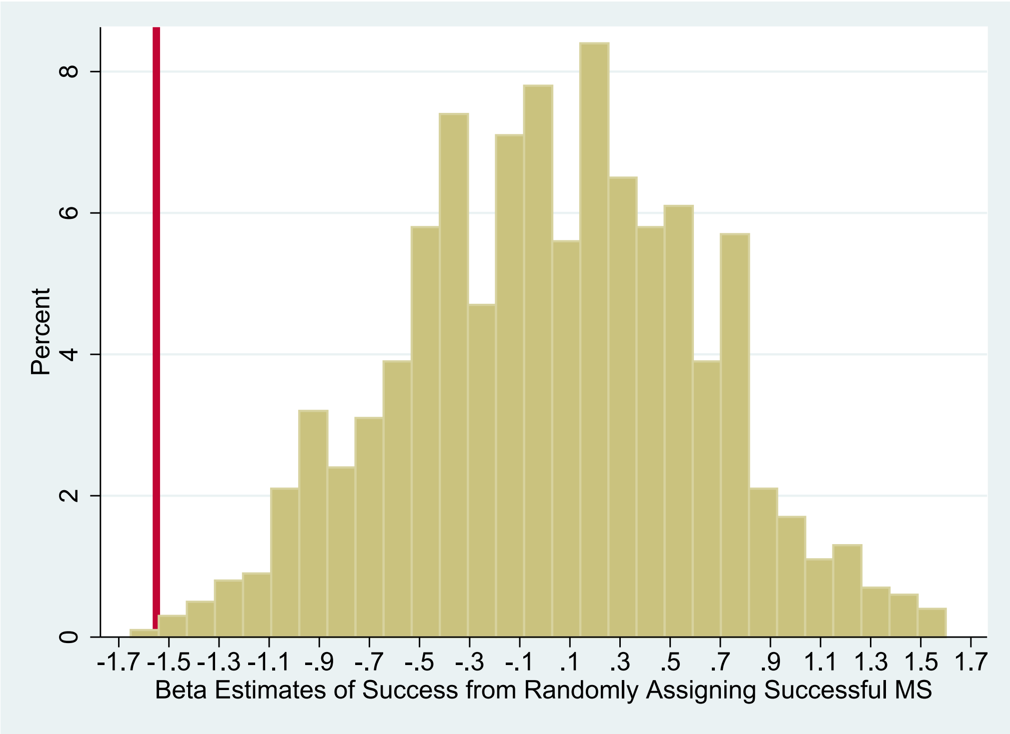
Notes: The Figure shows the result from OLS estimation of Equation 3. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 × the natural logarithm of business establishments-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A14: Impact of Successful vs Failed Mass Shooting on Establishments



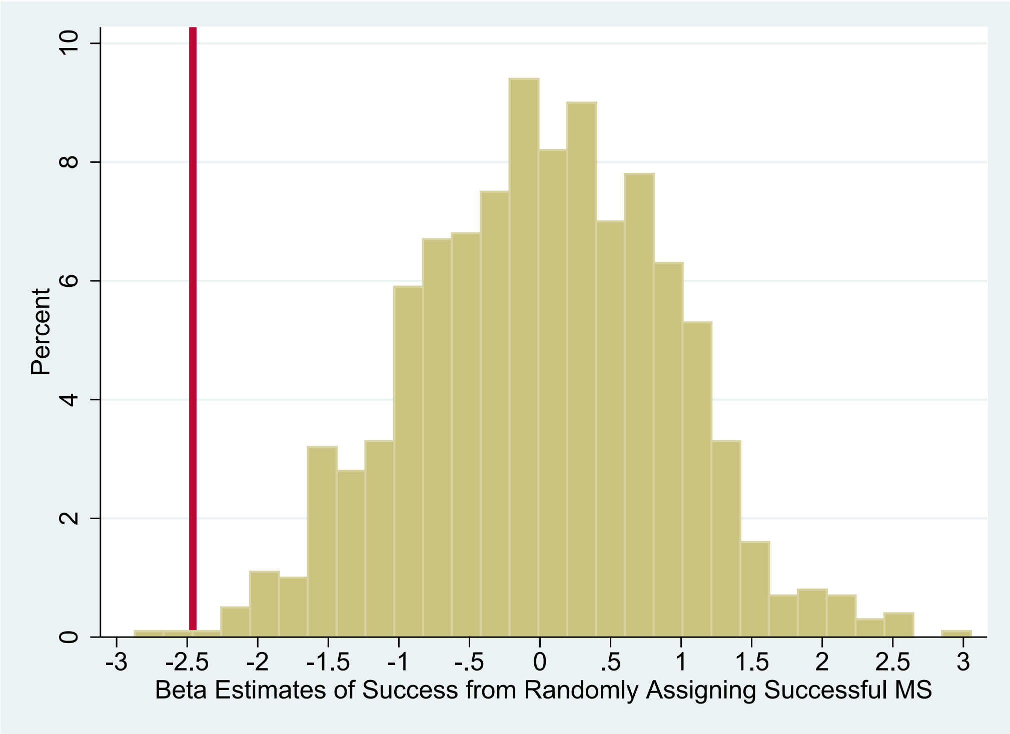
Notes: The Figure shows the result from OLS estimation of Equation 3. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The figure plots the estimated 100 × the natural logarithm of business establishments-to-population ratio in counties targeted by a failed mass shooting at yearly intervals around the shooting.

Figure A15: Permutation Test: Estimates of Impact of Successful vs Failed Mass Shooting on Employment



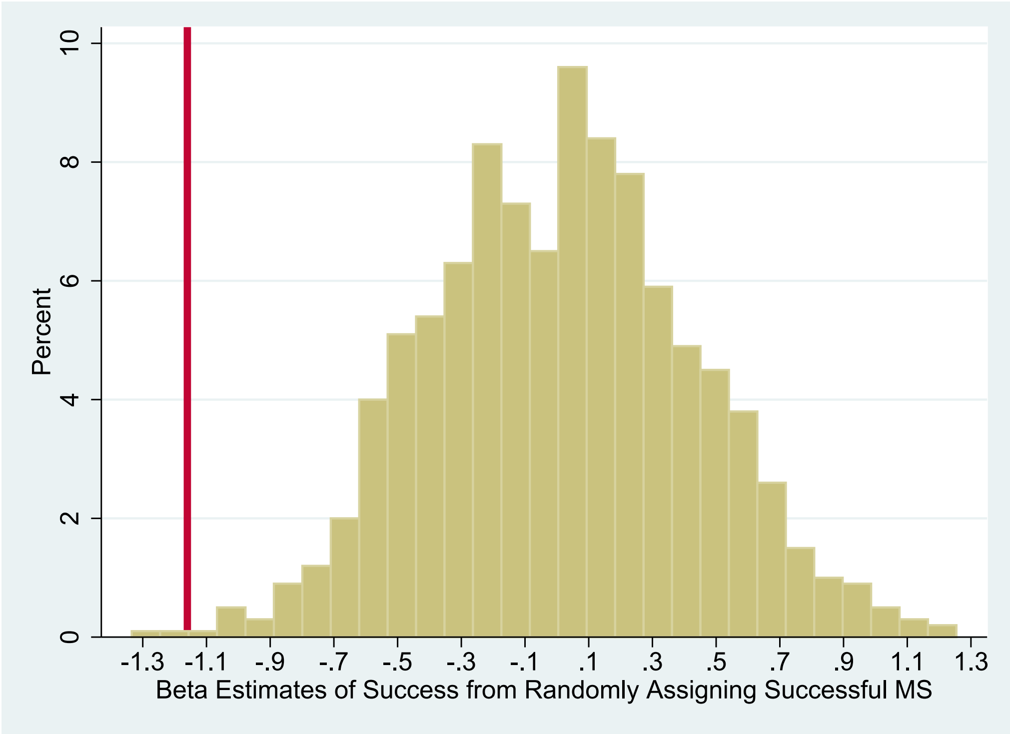
Notes: The Figure shows the result from OLS estimation of Equation 3 by randomly assigning location and timing of failed and successful mass shootings. The sample was restricted to counties with a failed or successful mass shooting, and only county-year observations up to four years after the shooting and six years prior to the shooting were used. The number of successful and failed mass shootings in the randomly generated sample are kept same to the original number of successful and failed mass shootings. The exercise is repeated 1,000 times. The figure plots the distribution of the estimates of "Success", where the dependent variable is the natural logarithm of the yearly employment-to-population ratio. The vertical line shows the estimates obtained using the actual location and timing of successful and failed mass shootings.

Figure A16: Permutation Test: Estimates of Impact of Successful vs Failed Mass Shooting on Earnings



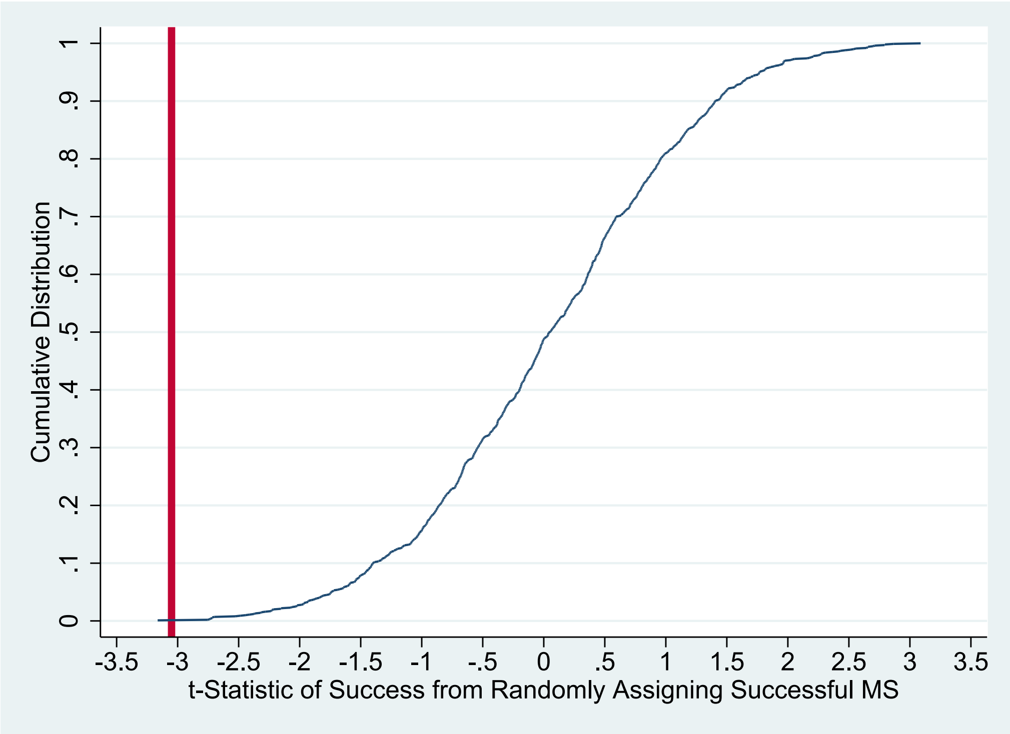
Notes: The Figure shows the result from OLS estimation of Equation 3 by randomly assigning location and timing of failed and successful mass shootings. The sample was restricted to counties with a failed or successful mass shooting, and only county-year observations up to four years after the shooting and six years prior to the shooting were used. The number of successful and failed mass shootings in the randomly generated sample are kept same to the original number of successful and failed mass shootings. The exercise is repeated 1,000 times. The figure plots the distribution of the estimates of "Success", where the dependent variable is the natural logarithm of the yearly real earnings-to-population ratio. The vertical line shows the estimates obtained using the actual location and timing of successful and failed mass shootings.

Figure A17: Permutation Test: Estimates of Impact of Successful vs Failed Mass Shooting on Establishments



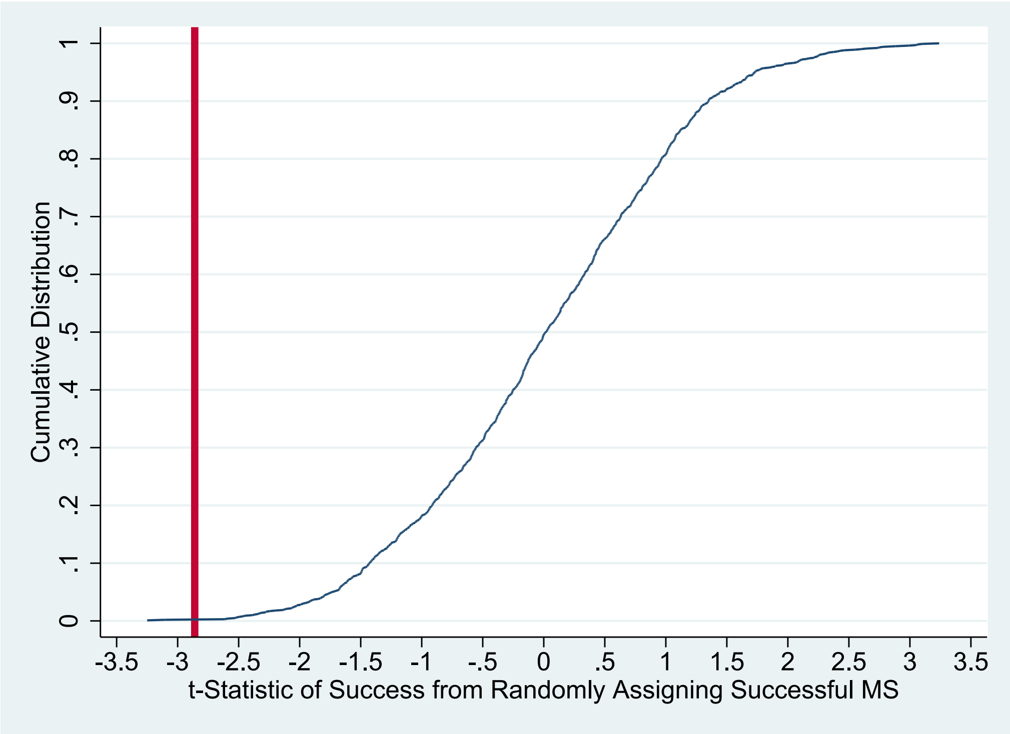
Notes: The Figure shows the result from OLS estimation of Equation 3 by randomly assigning location and timing of failed and successful mass shootings. The sample was restricted to counties with a failed or successful mass shooting, and only county-year observations up to four years after the shooting and six years prior to the shooting were used. The number of successful and failed mass shootings in the randomly generated sample are kept same to the original number of successful and failed mass shootings. The exercise is repeated 1,000 times. The figure plots the distribution of the estimates of "Success", where the dependent variable is the natural logarithm of the yearly business establishments-to-population ratio. The vertical line shows the estimates obtained using the actual location and timing of successful and failed mass shootings.

Figure A18: Permutation Test: t-Statistics of Impact of Successful vs Failed Mass Shooting on Employment



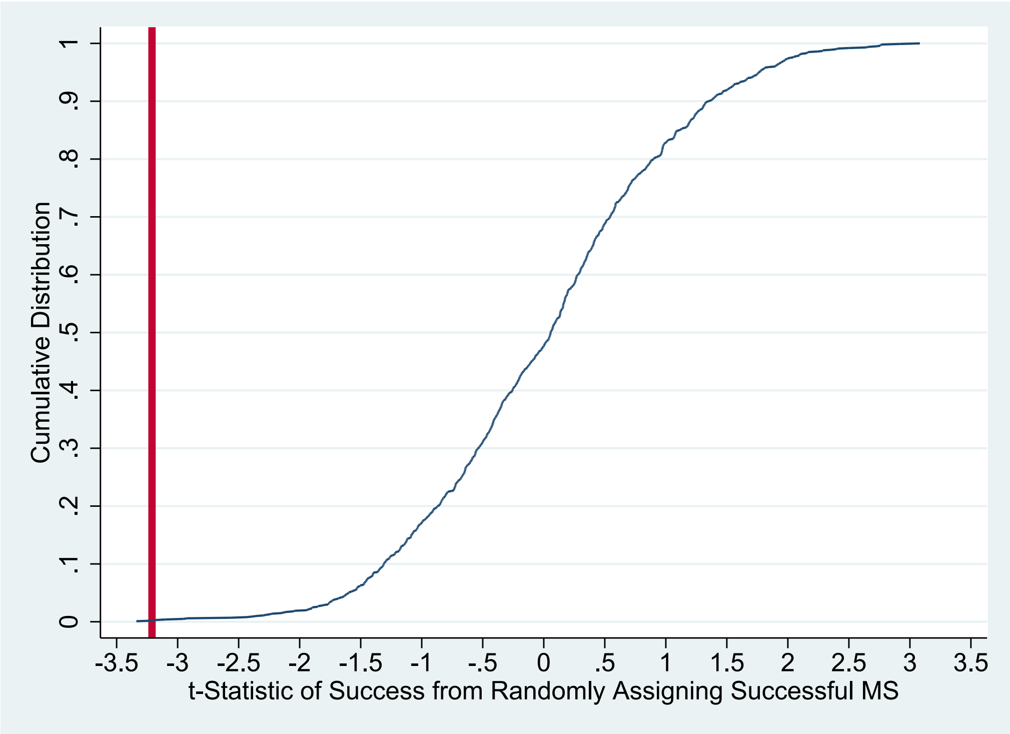
Notes: The Figure shows the result from OLS estimation of Equation 3 by randomly assigning location and timing of failed and successful mass shootings. The sample was restricted to counties with a failed or successful mass shooting, and only county-year observations up to four years after the shooting and six years prior to the shooting were used. The number of successful and failed mass shootings in the randomly generated sample are kept same to the original number of successful and failed mass shootings. The exercise is repeated 1,000 times. The figure plots the cumulative distribution function of t-statistics of "Success", where the dependent variable is the natural logarithm of the yearly employment-to-population ratio. The vertical line shows the t-statistics obtained using the actual location and timing of successful and failed mass shootings.

Figure A19: Permutation Test: t-Statistics of Impact of Successful vs Failed Mass Shooting on Earnings



Notes: The Figure shows the result from OLS estimation of Equation 3 by randomly assigning location and timing of failed and successful mass shootings. The sample was restricted to counties with a failed or successful mass shooting, and only county-year observations up to four years after the shooting and six years prior to the shooting were used. The number of successful and failed mass shootings in the randomly generated sample are kept same to the original number of successful and failed mass shootings. The exercise is repeated 1,000 times. The figure plots the cumulative distribution function of t-statistics of "Success", where the dependent variable is the natural logarithm of the yearly real earnings-to-population ratio. The vertical line shows the t-statistics obtained using the actual location and timing of successful and failed mass shootings.

Figure A20: Permutation Test: t-Statistics of Impact of Successful vs Failed Mass Shooting on Establishments



Notes: The Figure shows the result from OLS estimation of Equation 3 by randomly assigning location and timing of failed and successful mass shootings. The sample was restricted to counties with a failed or successful mass shooting, and only county-year observations up to four years after the shooting and six years prior to the shooting were used. The number of successful and failed mass shootings in the randomly generated sample are kept same to the original number of successful and failed mass shootings. The exercise is repeated 1,000 times. The figure plots the cumulative distribution function of t-statistics of "Success", where the dependent variable is the natural logarithm of the yearly business establishments-to-population ratio. The vertical line shows the t-statistics obtained using the actual location and timing of successful and failed mass shootings.

Table A1: Socioeconomic Characteristics of Shooters: At Least Four Casualties Including the Shooter

	All	School Related	Workplace Related	Other Type	
Risk Factors					
Financial Distress	40%	18%	68%	34%	
Family Violence	40%	9%	20%	52%	
Religious/Racial	18%	9%	20%	18%	
Political	4%	0%	12%	1%	
Social Rejection	4%	27%	4%	0%	
School Failure	4%	27%	0%	1%	
Unknown	13%	9%	16%	13%	
	All	School Related	Workplace Related	Other Type	U.S. Census
Employment					
Employed	43%	25%	29%	50%	69%
Student	11%	50%	0%	9%	12%
Unemp. or Out Labor	46%	25%	71%	41%	19%
Schooling					
Some High School	23%	33%	33%	17%	14%
Grad. High School	21%	11%	33%	20%	29%
Some College	33%	56%	22%	30%	24%
Grad. College	22%	0%	11%	33%	32%
Martial Status					
Married/Partner	40%	22%	27%	39%	44%
Divorced/Separated	32%	44%	40%	13%	13%
Single	27%	33%	33%	43%	42%
Child	43%	22%	36%	32%	55%
Race					
White	50%	36%	48%	55%	73%
Black/African Ame.	21%	0%	24%	24%	13%
Other (or Two) Race	29%	74%	28%	21%	14%
Demographics					
Age	35	28	39	34	36
Born U.S.	82%	73%	83%	84%	81%
Male	95%	100%	96%	94%	50%
Mental Illness	41%	73%	44%	35%	5%
Military	18%	9%	12%	21%	10%
Place of Residence	97%	100%	100%	96%	
Total Observations	107	11	25	71	

Notes: We collect socioeconomic characteristics for a total of 107 mass shootings. Mass shootings are defined as shootings leading to at least four deaths, including the shooter. For some mass shootings, multiple risk factors were documented. "Financial Distress" includes being recently fired from job, history of financial difficulties and financial dispute with the victim(s). "School Failure" includes expulsion, suspension or failing classes. "Social Rejection" includes bullying or parents' divorce. The variable "Mental Illness" equals one if the perpetrator had a mental disorder, a history of mental illness or suffered from sever depression. "Military" equals one if the perpetrator was or used to be in the military. Mass shootings classified as "Other & Unknown" include, for instance, gang-related incidents, military-related incidents and misogyny. The last column reports summary statistics from the 2010 American Community Survey for male Americans aged 25–45. Data on metal health comes from the Substance Abuse and Mental Health Services Administration. Data on military is from the Department of Veterans Affairs. Data on fertility is from the Current Population Survey.

Table A2: Predicting Mass Shootings

	Success (1)	Other Counties (2)	Difference (3)
100× Log Jobs per Capita	-98.79	-140.47	42.48***
	(35.75)	(45.72)	(3.51)
100 × Log Total Real Earnings	115.59	46.27	70.54***
	(55.60)	(61.63)	(4.70)
100 × Log Establishments per Capita	-373.66	-381.17	8.24***
	(25.21)	(35.38)	(2.73)
House Value Index	133.62	132.05	3.38
	(33.24)	(27.96)	(2.85)
Log Population	12.80	10.27	2.54***
	(1.49)	(1.42)	(0.11)
Proportion male	0.49	0.50	-0.01
	(0.01)	(0.02)	(0.01)
Log Population 18-65 Years	20.51	15.42	5.11***
	(3.00)	(2.87)	(0.22)
Proportion Completed High School	0.28	0.35	-0.07***
	(0.06)	(0.07)	(0.01)
Racial Diversity Index	1.11	0.98	0.14***
	(0.45)	(0.31)	(0.02)
Proportion Living in Poverty	0.16	0.15	0.01***
	(0.05)	(0.06)	(0.00)
Income Inequality Gini	0.45	0.42	0.03***
	(0.04)	(0.06)	(0.00)
100000 × Log Violent Crime per Capita	3.77	15.92	-12.08***
	(5.09)	(17.63)	(1.40)
100000 × Log Property Crime per Capita	5.37	30.21	-24.77***
	(7.46)	(36.10)	(2.97)
100000 × Log Homicides by Gun per Capita	6.65	1.82	3.68***
	(5.12)	(3.40)	(0.26)
100000 × Log Suicides by Gun per Capita	6.96	8.40	-1.75***
	(4.38)	(7.21)	(0.54)
Airport - Large Hub	0.13	0.01	0.12***
	(0.33)	(0.09)	(0.01)
Airport - Medium Hub	0.13	0.01	0.12***
	(0.33)	(0.09)	(0.01)
Coastal County	0.47	0.19	0.27***
	(0.50)	(0.40)	(0.04)
State Capitol	0.12	0.01	0.11***
	(0.32)	(0.10)	(0.01)
Region Northeast	0.10	0.07	0.03
	(0.30)	(0.25)	(0.02)
Region Midwest	0.22	0.34	-0.12***
	(0.42)	(0.47)	(0.04)
Region South	0.47	0.44	0.03
	(0.5)	(0.50)	(0.04)
Region West	0.21	0.15	0.06**
	(0.41)	(0.36)	(0.03)

Notes: The Table shows mean of variables in counties with a successful mass shooting (Column 1) and counties without a mass shooting (Column 2). Standard deviations are in parentheses (standard errors for Column 3). Each observation is a county-year cell. All time-varying variables (i.e., from "100 × Log Jobs per Capita" to "100000 × Log Suicides by Gun per Capita") are examined in the year before the mass shooting(s) took place.

Table A3: Impact of Successful Mass Shootings on Establishments

	Log Businesses per Capita		
	(1)	(2)	(3)
Success (t - 5)	0.104	0.053	-0.021
	(0.180)	(0.136)	(0.138)
Success (t - 4)	0.038	0.080	0.035
	(0.272)	(0.264)	(0.274)
Success (t - 3)	0.164	0.230	0.078
	(0.305)	(0.285)	(0.274)
Success (t - 2)	-0.060	-0.006	-0.073
	(0.411)	(0.339)	(0.307)
Success	-0.718	-0.575**	-0.658***
	(0.547)	(0.277)	(0.233)
Success (t + 1)	-0.919	-0.952***	-1.081***
	(0.595)	(0.251)	(0.240)
Success (t + 2)	-1.156*	-1.084***	-1.052***
	(0.640)	(0.269)	(0.312)
Success (t + 3)	-1.330**	-1.085***	-0.960***
	(0.566)	(0.315)	(0.345)
Success (t + 4)	-1.477**	-1.220***	-1.069***
	(0.612)	(0.378)	(0.371)
Observations	1,464	1,464	1,464
R-squared	0.990	0.994	0.994
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Shooting Controls	No	Yes	Yes
Control:LEA End MS	No	Yes	Yes
Region × Year FE	No	Yes	No
Division × Year FE	No	No	Yes
Month × Year FE	No	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 2. The sample is restricted to counties with a successful mass shooting. Only county-year observations up to four years after the successful shooting and six years prior to the successful shooting are included. The dependent variable is 100 × the natural logarithm of the ratio of business establishments to population. The main independent variables are leads and lags of "Success," which are dummy variables equal to one if the county had a successful mass shooting in year t and zero otherwise. Shooting controls include the age and gender of the perpetrator and the weapon used by the perpetrator to perform shooting. Establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A4: Impact of Failed Mass Shootings on Employment and Earnings

	100 × Log Jobs per Capita			100 × Log Earnings per Capita		
	(1)	(2)	(3)	(4)	(5)	(6)
Fail (t - 5)	-0.163	-0.362	-0.536	-0.019	-0.436	-0.710
	(0.525)	(0.612)	(0.653)	(0.734)	(0.794)	(0.824)
Fail (t - 4)	-0.392	-0.739	-0.810	-0.331	-0.842	-1.144
	(0.752)	(0.853)	(0.903)	(0.904)	(1.038)	(1.048)
Fail (t - 3)	0.174	-0.040	0.136	0.669	0.299	0.387
	(0.558)	(0.589)	(0.601)	(0.674)	(0.870)	(0.853)
Fail (t - 2)	0.062	0.014	0.159	0.452	0.290	0.544
	(0.374)	(0.305)	(0.337)	(0.518)	(0.500)	(0.591)
Fail	-0.379	-0.564	-0.221	0.007	0.058	0.693
	(0.485)	(0.407)	(0.514)	(0.599)	(0.554)	(0.647)
Fail (t + 1)	-0.909	-1.069	-0.826	-0.946	-0.735	-0.123
	(0.614)	(0.651)	(0.752)	(0.810)	(0.699)	(0.666)
Fail (t + 2)	-0.119	-0.283	0.137	-0.379	0.003	0.861
	(0.748)	(0.588)	(0.667)	(1.000)	(0.839)	(0.758)
Fail (t + 3)	-0.729	-0.776	-0.450	-1.674	-1.326	-0.568
	(0.798)	(0.870)	(1.056)	(0.997)	(0.940)	(0.943)
Fail (t + 4)	-0.655	-0.233	0.154	-1.090	-0.073	0.915
	(0.781)	(0.967)	(1.182)	(1.049)	(1.232)	(1.297)
Observations	1,094	1,094	1,094	1,094	1,094	1,094
R-squared	0.988	0.993	0.994	0.990	0.994	0.995
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	Yes	Yes	No	Yes	Yes
Region × Year FE	No	Yes	No	No	Yes	No
Division × Year FE	No	No	Yes	No	No	Yes
Month × Year FE	No	Yes	Yes	No	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 2. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the failed shooting and six years prior to the failed shooting are included. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (Columns 1–3) and 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (Columns 4–6), respectively. The main independent variable are leads and lags of "Fail," which are dummy variables equal to one if the county had a failed mass shooting in year t and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for weapon used during the shooting. Employment and earnings data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A5: Impact of Failed Mass Shootings on Establishments

	100 × Log Establishments per Capita		
	(1)	(2)	(3)
Fail (t - 5)	-0.046	0.074	0.122
	(0.385)	(0.392)	(0.423)
Fail (t - 4)	-0.415	-0.127	-0.062
	(0.375)	(0.281)	(0.332)
Fail (t - 3)	-0.541	-0.087	0.064
	(0.335)	(0.246)	(0.292)
Fail (t - 2)	-0.599	0.040	0.261
	(0.396)	(0.216)	(0.201)
Fail	-0.941*	-0.385	-0.405
	(0.505)	(0.368)	(0.381)
Fail (t + 1)	-1.409**	-0.700	-0.719*
	(0.577)	(0.454)	(0.416)
Fail (t + 2)	-1.468*	-0.691	-0.724
	(0.725)	(0.710)	(0.652)
Fail (t + 3)	-1.380*	-0.539	-0.697
	(0.738)	(0.760)	(0.721)
Fail (t + 4)	-1.198	0.173	-0.012
	(0.756)	(0.815)	(0.895)
Observations	1,094	1,094	1,094
R-squared	0.991	0.996	0.996
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Shooting Controls	No	Yes	Yes
Region × Year FE	No	Yes	No
Division × Year FE	No	No	Yes
Month × Year FE	No	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 2. The sample is restricted to counties with a failed mass shooting. Only county-year observations up to four years after the failed shooting and six years prior to the failed shooting are included. The dependent variable is 100 × the natural logarithm of the ratio of business establishments to population. The main independent variables are leads and lags of "Fail," which are dummy variables equal to one if the county had a failed mass shooting in year t and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for weapon used during the shooting. Employment and earnings data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A6: Impact of Successful vs Failed Mass Shootings on Economic Outcomes: Leads and Lags

	100 × Log Jobs per Capita				100 × Log Earnings per Capita			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Success (t - 5)	0.290	0.224	0.125	0.093	-0.072	-0.153	-0.287	-0.494
	(0.309)	(0.321)	(0.346)	(0.322)	(0.492)	(0.523)	(0.466)	(0.472)
Success (t - 4)	0.017	0.031	-0.094	-0.061	-0.267	-0.218	-0.276	-0.476
	(0.342)	(0.379)	(0.370)	(0.363)	(0.636)	(0.743)	(0.693)	(0.659)
Success (t - 3)	0.338	0.452	0.302	0.321	0.849	1.104	1.033	0.774
	(0.475)	(0.465)	(0.430)	(0.423)	(0.645)	(0.691)	(0.657)	(0.631)
Success (t - 2)	-0.507	-0.486	-0.573	-0.544	-0.499	-0.278	-0.437	-0.599
	(0.499)	(0.476)	(0.445)	(0.422)	(0.626)	(0.627)	(0.601)	(0.536)
Success	-1.528**	-1.540***	-1.423***	-1.413***	-2.033**	-1.910***	-1.755***	-1.832***
	(0.590)	(0.438)	(0.381)	(0.343)	(0.862)	(0.669)	(0.614)	(0.612)
Success (t + 1)	-1.925***	-1.991***	-1.789***	-1.764***	-2.799***	-2.813***	-2.443***	-2.417***
	(0.570)	(0.463)	(0.441)	(0.419)	(0.967)	(0.827)	(0.790)	(0.787)
Success (t + 2)	-1.919***	-1.740***	-1.522***	-1.440***	-2.949***	-2.499**	-2.146**	-2.162**
	(0.642)	(0.550)	(0.565)	(0.532)	(1.048)	(0.959)	(0.967)	(0.923)
Success (t + 3)	-2.381***	-2.155***	-1.838**	-1.753**	-3.499***	-2.963***	-2.535**	-2.528**
	(0.631)	(0.717)	(0.771)	(0.757)	(0.901)	(0.991)	(1.116)	(1.042)
Success (t + 4)	-1.963***	-1.808***	-1.411**	-1.290*	-3.415***	-2.892***	-2.363**	-2.231**
	(0.605)	(0.541)	(0.641)	(0.677)	(0.938)	(0.957)	(1.053)	(1.100)
Observations	2,271	2,271	2,271	2,271	2,271	2,271	2,271	2,271
R-Squared	0.989	0.991	0.992	0.993	0.990	0.992	0.993	0.993
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Law Enforcement	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Region × Year FE	No	No	Yes	No	No	No	Yes	No
Division × Year FE	No	No	No	Yes	No	No	No	Yes
Month × Year FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 4. Only county-year observations up to four years after the successful shooting and six years prior to successful and failed shootings are included. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (Columns 1–3) and 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (Columns 4–6), respectively. The main independent variables are leads and lags of "Success," which are dummy variables equal to one if the county had a successful mass shooting in year t and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for weapon used during the shooting. Columns 2–4 and Columns 6–8 include a dummy for whether the shooting ended because of law enforcement intervention. Employment and earnings data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A7: Impact of Successful vs Failed Mass Shootings on Establishments: Leads and Lags

	(1)	(2)	(3)	(4)
	100 × Log Establishments per Capita			
Success (t - 5)	0.158	0.096	0.034	0.042
	(0.181)	(0.156)	(0.149)	(0.165)
Success (t - 4)	0.031	0.047	-0.000	-0.003
	(0.262)	(0.255)	(0.237)	(0.275)
Success (t - 3)	0.086	0.175	0.079	0.084
	(0.306)	(0.300)	(0.278)	(0.269)
Success (t - 2)	-0.201	-0.095	-0.088	-0.031
	(0.380)	(0.372)	(0.326)	(0.315)
Success	-1.027**	-0.812**	-0.772**	-0.752**
	(0.444)	(0.399)	(0.313)	(0.329)
Success (t + 1)	-1.302***	-1.074***	-1.027***	-0.941***
	(0.437)	(0.375)	(0.300)	(0.318)
Success (t + 2)	-1.566***	-1.259***	-1.096***	-0.959***
	(0.483)	(0.393)	(0.334)	(0.351)
Success (t + 3)	-1.848***	-1.472***	-1.246***	-1.077***
	(0.444)	(0.409)	(0.364)	(0.344)
Success (t + 4)	-2.080***	-1.624***	-1.393***	-1.216***
	(0.488)	(0.429)	(0.381)	(0.368)
Observations	2,271	2,271	2,271	2,271
R-squared	0.991	0.993	0.994	0.994
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Shooting Controls	No	Yes	Yes	Yes
Control:LEA End MS	No	Yes	Yes	Yes
Region x Year FE	No	No	Yes	No
Division x Year FE	No	No	No	Yes
Month x Year FE	No	Yes	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 4. Only county-year observations up to four years after the successful shooting and six years prior to successful and failed shootings are included. The dependent variables are 100 × the natural logarithm of the ratio of establishments to population. The main independent variables are leads and lags of "Success," which are dummy variables equal to one if the county had a successful mass shooting in year t and zero otherwise. Shooting controls include the age and gender of the perpetrator and the weapon used by the perpetrator to perform shooting. Employment and earnings data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A8: Robustness Checks: Location of Successful Mass Shootings

Panel A	100 × Log Jobs per Capita		
	(1)	(2)	(3)
Post Shooting	0.848	0.613	1.194
	(1.928)	(1.653)	(1.293)
Success	-3.181*	-1.956	-1.487***
	(1.666)	(1.590)	(0.440)
R-Squared	0.993	0.991	0.992
Panel B	100 × Log Real Earnings per Capita		
Post Shooting	0.378	1.776	3.466*
	(2.218)	(1.866)	(1.900)
Success	-3.464	-2.781	-2.392***
	(2.669)	(2.062)	(0.704)
R-Squared	0.994	0.992	0.992
Shooting Location	Workplace	School	All other
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Shooting Controls	Yes	Yes	Yes
Month × Year FE	Yes	Yes	Yes
Observations	1,207	1,244	2,023

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. Column 1 restricts the sample of successful mass shootings to shootings that occurred in the workplace. Column 2 restricts the sample of successful mass shootings to shootings that occurred in a school or university. Column 3 restricts the sample of successful mass shootings to all other shootings i.e., shootings that did not take place in the workplace or schools/universities. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (panel A), 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (panel B) and 100 × the natural logarithm of the ratio of business establishments to population (panel C), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. Employment, earnings and establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A9: Impact of Successful vs Failed Mass Shootings on Wage per Job, and Jobs per Establishment

Panel A	100 × Log Real Wage per Job					
	(1)	(2)	(3)	(4)	(5)	(6)
Post Shooting	1.889*	2.355*	2.501*	2.499*	2.522*	1.488
	(1.095)	(1.195)	(1.391)	(1.385)	(1.360)	(1.114)
Success		-1.085*	-0.973*	-0.968*	-1.091**	-0.928*
		(0.541)	(0.484)	(0.487)	(0.489)	(0.547)
R-squared	0.984	0.985	0.988	0.988	0.988	0.990
Panel B	100 × Log Jobs per Establishment					
Post Shooting	-0.152	0.030	0.380	0.380	0.070	-0.738
	(0.882)	(0.910)	(0.700)	(0.699)	(0.679)	(0.799)
Success		-0.425	-0.594	-0.595	-0.478	-0.446
		(0.366)	(0.447)	(0.447)	(0.461)	(0.499)
R-squared	0.981	0.981	0.985	0.985	0.985	0.986
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	No	Yes	Yes	Yes	Yes
Law Enforcement	No	No	No	Yes	Yes	Yes
Region × Year FE	No	No	No	No	Yes	No
Division × Year FE	No	No	No	No	No	Yes
Month × Year FE	No	No	Yes	Yes	Yes	Yes
Observations	2,271	2,271	2,271	2,271	2,271	2,271

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variables are 100 × the natural logarithm of the ratio of real wage per job (panel A), and 100 × the natural logarithm of the ratio of jobs per business establishment (panel B), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Successful," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for weapon used during the shooting. Columns 4–6 include a dummy for whether the shooting ended because of law enforcement intervention. Employment and earnings data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A10: Impact of Successful vs Failed Mass Shootings on Business Establishments by Size

Panel A	100 × Log Small Business Establishments per Capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Post Shooting	0.312	0.898	1.040	1.041	0.920	1.295
	(0.976)	(1.033)	(0.912)	(0.912)	(0.920)	(0.851)
Success		-1.363***	-1.235***	-1.237***	-1.093***	-1.110***
		(0.434)	(0.360)	(0.357)	(0.309)	(0.304)
R-Squared	0.990	0.991	0.993	0.993	0.994	0.994
Panel B	100 × Log Medium Business Establishments per Capita					
Post Shooting	-0.265	0.305	0.292	0.293	-0.012	-1.772
	(1.624)	(1.756)	(1.505)	(1.507)	(1.249)	(1.751)
Success		-1.328	-1.009	-1.012	-0.719	-0.496
		(1.448)	(1.969)	(1.973)	(1.960)	(2.100)
R-squared	0.958	0.958	0.962	0.962	0.963	0.965
Panel C	100 × Log Large Business Establishments per Capita					
Post Shooting	-0.776	-1.240	-0.487	-0.481	-1.979	-1.129
	(2.161)	(2.141)	(3.290)	(3.296)	(2.918)	(3.251)
Success		1.082	0.440	0.422	1.509	1.861
		(2.021)	(1.958)	(1.939)	(1.929)	(1.959)
R-Squared	0.935	0.935	0.943	0.943	0.946	0.948
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	No	Yes	Yes	Yes	Yes
Law Enforcement	No	No	No	Yes	Yes	Yes
Region × Year FE	No	No	No	No	Yes	No
Division × Year FE	No	No	No	No	No	Yes
Month × Year FE	No	No	Yes	Yes	Yes	Yes
Observations	2,271	2,271	2,271	2,271	2,271	2,271

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variables are 100 × the natural logarithm of the ratio of small business establishments to population (panel A), 100 × the natural logarithm of the ratio of medium business establishments to population (panel B) and 100 × the natural logarithm of the ratio of large business establishments to population (panel C), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for weapon used during the shooting. Columns 4–6 include a dummy for whether the shooting ended because of law enforcement intervention. Employment, earnings and establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A11: Impact of Successful vs Failed Mass Shootings on Neighboring Counties

Panel A	100 × Log Jobs per Capita		
	(1)	(2)	(3)
Post Shooting	-1.590*	-1.138	-1.642*
	(0.796)	(1.333)	(0.913)
Success		-0.769	-0.979
		(1.408)	(1.591)
R-Squared	0.980	0.980	0.983
Panel B	100 × Log Real Earnings per Capita		
Post Shooting	-1.640	-1.167	-1.501
	(1.056)	(1.782)	(1.311)
Success		-0.804	-1.743
		(1.993)	(2.221)
R-Squared	0.981	0.981	0.986
Panel C	100 × Log Business Establishments per Capita		
Post Shooting	-1.280**	-1.216	-0.964
	(0.612)	(0.846)	(0.665)
Success		-0.110	0.112
		(0.898)	(0.873)
R-Squared	0.990	0.990	0.992
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Shooting Controls	No	No	Yes
Month × Year FE	No	No	Yes
Observations	2,530	2,530	2,506

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (Panel A), 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (Panel B) and 100 × the natural logarithm of the ratio of business establishments to population (Panel C), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator. Employment, earnings and establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A12: Impact of Successful vs Failed Mass Shootings: QCEW Data

Panel A	100 × Log Jobs per Capita					
	(1)	(2)	(3)	(4)	(5)	
Post Shooting	0.417	0.885	0.783	0.784	0.804	0.386
	(1.059)	(1.139)	(0.920)	(0.920)	(0.909)	(0.907)
Success		-1.137*	-1.227**	-1.228**	-1.052**	-1.175***
		(0.628)	(0.470)	(0.471)	(0.422)	(0.430)
R-Squared	0.991	0.991	0.994	0.994	0.994	0.995
Panel B	100 × Log Real Earnings per Capita					
Post Shooting	2.151	3.111*	2.680*	2.675*	3.040**	2.124
	(1.507)	(1.612)	(1.365)	(1.368)	(1.393)	(1.319)
Success		-2.332**	-2.156**	-2.151**	-2.080**	-2.143**
		(1.027)	(0.864)	(0.871)	(0.851)	(0.811)
R-Squared	0.990	0.991	0.993	0.993	0.994	0.995
Panel C	100 × Log Business Establishments per Capita					
Post Shooting	2.688	3.540	2.254	2.233	1.215	1.604
	(2.119)	(2.282)	(1.997)	(2.021)	(1.863)	(1.806)
Success		-2.070**	-1.531*	-1.510*	-1.233	-1.380*
		(1.017)	(0.844)	(0.836)	(0.760)	(0.712)
R-Squared	0.979	0.979	0.986	0.986	0.987	0.988
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	No	Yes	Yes	Yes	Yes
Law Enforcement	No	No	No	Yes	Yes	Yes
Region × Year FE	No	No	No	No	Yes	No
Division × Year FE	No	No	No	No	No	Yes
Observations	2,070	2,070	2,070	2,070	2,070	2,070

Notes: The Table shows results from an OLS estimation of Equation 3 using data from the Quarterly Census of Employment and Wages (QCEW). The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The main dependent variables are 100 × the natural logarithm of the ratio of jobs to population (Panel A), 100 × the natural logarithm of the ratio of total real earnings to population (Panel B) and 100 × the natural logarithm of the ratio of business establishments to population (Panel C), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for weapon used during the shooting. Columns 4–6 include a dummy for whether the shooting ended because of law enforcement intervention. Employment, earnings and establishments data is taken from the County Business Patterns. The time period is 2000–2015. The standard errors are clustered at the state level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A13: Robustness Check: Pre- and Post-Mass Shootings Windows

Panel A	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
	100 × Log Jobs per Capita															
Post Shooting	0.456	-0.046	-0.093	-0.081	0.483	0.102	0.134	0.179	0.889	0.513	0.578	0.641	0.619	0.431	0.529	0.619
	(1.023)	(0.986)	(1.068)	(1.132)	(1.049)	(1.048)	(1.093)	(1.161)	(1.038)	(1.042)	(1.088)	(1.142)	(1.127)	(1.106)	(1.121)	(1.159)
Successful	-1.471***	-1.444***	-1.481***	-1.439***	-1.596***	-1.582***	-1.622***	-1.601***	-1.636***	-1.658***	-1.732***	-1.718***	-1.656***	-1.683***	-1.777***	-1.785***
	(0.507)	(0.508)	(0.504)	(0.483)	(0.470)	(0.486)	(0.482)	(0.465)	(0.500)	(0.514)	(0.517)	(0.498)	(0.497)	(0.518)	(0.529)	(0.517)
Panel B	100 × Log Real Earnings per Capita															
Post Shooting	2.077	1.816	2.001	2.191	2.564	2.297	2.459	2.648*	2.713*	2.436*	2.577*	2.791*	2.166	2.019	2.208	2.422
	(1.658)	(1.469)	(1.532)	(1.603)	(1.576)	(1.451)	(1.497)	(1.564)	(1.494)	(1.395)	(1.435)	(1.478)	(1.529)	(1.449)	(1.455)	(1.481)
Successful	-2.349***	-2.336***	-2.416***	-2.453***	-2.500***	-2.492***	-2.556***	-2.581***	-2.476***	-2.514***	-2.609***	-2.639***	-2.513***	-2.593***	-2.728***	-2.785***
	(0.697)	(0.731)	(0.754)	(0.725)	(0.708)	(0.749)	(0.765)	(0.737)	(0.754)	(0.796)	(0.810)	(0.779)	(0.784)	(0.842)	(0.862)	(0.842)
Panel C	100 × Log Business Establishments per Capita															
Post Shooting	1.446	1.584*	1.735*	1.803*	1.319*	1.419*	1.634*	1.722*	1.410*	1.484*	1.739**	1.796**	1.174	1.316*	1.525*	1.561*
	(0.895)	(0.907)	(0.912)	(0.938)	(0.766)	(0.806)	(0.834)	(0.875)	(0.718)	(0.741)	(0.761)	(0.804)	(0.796)	(0.776)	(0.788)	(0.819)
Successful	-1.010***	-1.015***	-1.067***	-1.042***	-1.112***	-1.134***	-1.183***	-1.169***	-1.103***	-1.144***	-1.207***	-1.195***	-1.091***	-1.136***	-1.211***	-1.210***
	(0.258)	(0.261)	(0.276)	(0.284)	(0.238)	(0.251)	(0.274)	(0.290)	(0.252)	(0.258)	(0.279)	(0.296)	(0.258)	(0.268)	(0.289)	(0.307)
Observations	1,517	1,646	1,755	1,840	1,689	1,816	1,925	2,010	1,850	1,977	2,086	2,171	2,004	2,130	2,239	2,324
Years in Pre Period	3	3	3	3	4	4	4	4	5	5	5	5	6	6	6	6
Years in Post Period	3	4	5	6	3	4	5	6	3	4	5	6	3	4	5	6

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with a successful or failed mass shooting. Each column varies the pre- and post-mass shootings windows. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (Panel A), 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (Panel B) and 100 × the natural logarithm of the ratio of business establishments to population (Panel C), respectively. Employment and earnings data are from the County Business Patterns. The time period is 2000–2015. All estimates include county fixed effects, year fixed effects, month-year of shooting fixed effects, shooting controls, a dummy for whether the shooting ended because of law enforcement intervention, and division-year fixed effects. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used by the perpetrator during the shooting. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A14: Robustness Checks: Impact of Successful Mass Shootings Using Full Sample

	Log Jobs per Capita			Log Earnings per Capita		
	(1)	(2)	(3)	(4)	(5)	(6)
Success (t - 5)	1.142*	0.327	0.259	1.789**	0.014	-0.064
	(0.569)	(0.485)	(0.519)	(0.876)	(0.753)	(0.791)
Success (t - 4)	0.505	-0.014	-0.163	1.010	-0.194	-0.380
	(0.576)	(0.539)	(0.535)	(1.053)	(1.011)	(1.023)
Success (t - 3)	0.784	0.630	0.411	1.887*	1.368	1.038
	(0.761)	(0.729)	(0.681)	(1.052)	(1.072)	(1.051)
Success (t - 2)	-0.349	-0.556	-0.760	0.117	-0.231	-0.540
	(0.700)	(0.682)	(0.643)	(0.955)	(0.979)	(0.983)
Success	-2.086**	-1.417**	-1.486**	-2.738**	-1.524	-1.669
	(0.825)	(0.657)	(0.619)	(1.207)	(1.150)	(1.119)
Success (t + 1)	-2.563***	-1.798**	-1.881***	-3.469**	-2.239*	-2.381**
	(0.822)	(0.696)	(0.686)	(1.302)	(1.204)	(1.178)
Success (t + 2)	-2.749***	-1.513**	-1.528**	-3.907**	-1.797	-1.935
	(0.851)	(0.752)	(0.753)	(1.488)	(1.360)	(1.346)
Success (t + 3)	-3.377***	-1.965***	-1.990***	-4.538***	-2.236**	-2.445**
	(0.721)	(0.687)	(0.683)	(1.190)	(1.084)	(1.068)
Success (t + 4)	-3.132***	-1.580***	-1.585***	-4.831***	-2.149**	-2.385**
	(0.766)	(0.536)	(0.564)	(1.263)	(1.002)	(1.026)
Observations	48,944	48,944	48,944	49,021	49,021	49,021
R-Squared	0.950	0.950	0.951	0.943	0.943	0.943
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	Yes	Yes	No	Yes	Yes
Region × Year FE	No	No	Yes	No	No	Yes
Month × Year FE	No	Yes	Yes	No	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 2. The sample uses all county-year observations, i.e. counties with a successful, failed, or no mass shooting. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (Columns 1–3) and 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (Columns 4–6), respectively. The main independent variables are leads and lags of "Success," which are dummy variables equal to one if the county had a successful mass shooting in year t and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. Employment and earnings data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A15: Robustness Checks: Impact of Successful Mass Shootings on Establishments Using Full Sample

	Log Businesses per Capita		
	(1)	(2)	(3)
Success (t - 5)	0.265	-0.067	-0.104
	(0.356)	(0.285)	(0.293)
Success (t - 4)	0.091	-0.090	-0.141
	(0.395)	(0.385)	(0.400)
Success (t - 3)	0.347	0.233	0.086
	(0.418)	(0.393)	(0.404)
Success (t - 2)	0.038	0.051	-0.038
	(0.481)	(0.485)	(0.474)
Success	-0.726	-0.389	-0.413
	(0.588)	(0.528)	(0.499)
Success (t + 1)	-0.891	-0.497	-0.529
	(0.542)	(0.473)	(0.461)
Success (t + 2)	-1.144*	-0.512	-0.482
	(0.601)	(0.484)	(0.482)
Success (t + 3)	-1.211**	-0.594	-0.483
	(0.540)	(0.470)	(0.476)
Success (t + 4)	-1.390**	-0.704	-0.579
	(0.610)	(0.463)	(0.482)
Observations	49,362	49,362	49,362
R-Squared	0.972	0.973	0.973
County FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Shooting Controls	No	Yes	Yes
Region × Year FE	No	No	Yes
Month × Year FE	No	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 2. The sample uses all county-year observations, i.e. counties with a successful, failed, or no mass shooting. The dependent variable is 100 × the natural logarithm of the ratio of business establishments to population. The main independent variables are leads and lags of "Success," which are dummy variables equal to one if the county had a successful mass shooting in year t and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. Establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A16: Robustness Checks: Impact of Mass Shootings Using Full Sample

Panel A	100 × Log Jobs per Capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Post Shooting -5.030***	0.152	1.377	1.381	0.448	-0.571	
	(1.608)	(1.459)	(1.162)	(1.162)	(1.118)	(1.326)
Success		-5.849***	-3.218***	-3.219***	-2.904***	-1.838**
		(1.125)	(0.784)	(0.785)	(0.758)	(0.863)
R-Squared	0.950	0.950	0.950	0.950	0.951	0.954
Panel B	100 × Log Real Earnings per Capita					
Post Shooting	-5.975***	2.433	3.535**	3.534**	2.195	0.306
	(1.993)	(1.841)	(1.739)	(1.737)	(1.878)	(1.757)
Success		-9.491***	-4.410***	-4.410***	-4.197***	-2.358*
		(1.847)	(1.112)	(1.111)	(1.171)	(1.382)
R-squared	0.943	0.943	0.943	0.943	0.943	0.949
Panel C	100 × Log Business Establishments per Capita					
Post Shooting	-1.102	1.463	1.209	1.210	0.673	0.521
	(1.080)	(1.120)	(0.836)	(0.838)	(0.904)	(0.955)
Success		-2.895***	-1.592***	-1.592***	-1.320***	-0.787
		(0.804)	(0.487)	(0.488)	(0.464)	(0.566)
R-Squared	0.972	0.972	0.973	0.973	0.973	0.975
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	No	Yes	Yes	Yes	Yes
Law Enforcement	No	No	No	Yes	Yes	Yes
Region × Year FE	No	No	No	No	Yes	No
Division × Year FE	No	No	No	No	No	Yes
Month × Year FE	No	No	Yes	Yes	Yes	Yes
Observations	49,362	49,362	49,362	49,362	49,362	49,362

Notes: The Table shows results from an OLS estimation of Equation 3. The sample uses all county-year observations, i.e. counties with a successful, failed, or no mass shooting. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (panel A), 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (panel B) and 100 × the natural logarithm of the ratio of business establishments to population (panel C), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for weapon used during the shooting. Columns 4–6 include a dummy for whether the shooting ended because of law enforcement intervention. Employment, earnings and establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A17: Impact of Successful vs Failed Mass Shootings on Population

	Log Total Population					
	(1)	(2)	(3)	(4)	(5)	(6)
Post Shooting	0.021	0.022	0.027	0.027	0.022	0.019
	(0.020)	(0.021)	(0.017)	(0.017)	(0.013)	(0.014)
Success		-0.004	-0.001	-0.001	-0.003	-0.003
		(0.006)	(0.005)	(0.005)	(0.005)	(0.004)
Observations	2,273	2,273	2,273	2,273	2,273	2,273
R-Squared	0.999	0.999	0.999	0.999	0.999	0.999
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	No	Yes	Yes	Yes	Yes
Law Enforcement	No	No	No	Yes	Yes	Yes
Region × Year FE	No	No	No	No	Yes	No
Division × Year FE	No	No	No	No	No	Yes
Month × Year FE	No	No	Yes	Yes	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variable is the natural logarithm of population. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for weapon used during the shooting. Columns 4–6 include a dummy for whether the shooting ended because of law enforcement intervention. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A18: Impact of Successful vs Failed Mass Shootings on Distribution of Population

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Log Population:						
	< 15 yrs.	15-24 yrs.	25-34 yrs.	35-44 yrs.	45-54 yrs.	55-64 yrs.	> 65 yrs.
Post Shooting	0.003	0.026*	0.051***	0.036**	0.028**	0.024*	0.004
	(0.037)	(0.013)	(0.015)	(0.017)	(0.012)	(0.013)	(0.027)
Success	0.018	-0.003	-0.003	-0.001	-0.003	-0.009	0.001
	(0.014)	(0.006)	(0.006)	(0.007)	(0.005)	(0.006)	(0.007)
Observations	2,269	2,271	2,271	2,271	2,271	2,271	2,271
R-Squared	0.998	0.999	0.999	0.999	0.999	0.999	0.999
County FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Month x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variable is the natural logarithm of population of different ages. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A19: Impact of Successful vs Failed Mass Shootings on Migration Flows

	(1) Same House	(2) Move Within County	(3) Move Outside County	(4) Move Outside State	(5) Move Outside US
Post Shooting	-1.010	0.718	0.240	0.079	-0.027
	(0.692)	(0.521)	(0.152)	(0.150)	(0.114)
Success	0.039	-0.067	0.015	-0.005	0.018
	(0.164)	(0.099)	(0.067)	(0.074)	(0.033)
Observations	2,273	2,273	2,273	2,273	2,273
R-Squared	0.958	0.951	0.971	0.968	0.937
County FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Shooting Controls	Yes	Yes	Yes	Yes	Yes
Month × Year FE	Yes	Yes	Yes	Yes	Yes

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variables are percentage of individuals in a county that reside in the same house as the year before (Column 1), percentage of individuals who moved within the same county (Column 2), percentage of individuals who moved outside the county but within the same state (Column 3), percentage of individuals who moved outside the state (Column 4), and percentage of individuals who moved outside the country (Column 5). The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. The dependent variables are constructed using the Census and American Community Survey. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A23: QCEW Employment Estimates By Industry

	100 × Log Jobs per Capita					
Panel A:	Services	Prof. Services	Educ. Health	Other Services	Leisure Hospit.	Finance
	(1)	(2)	(3)	(4)	(5)	(6)
Post Shooting	-0.507	-2.984	-0.680	1.921	-0.586	1.136
	(1.032)	(2.749)	(2.837)	(1.928)	(2.040)	(1.762)
Successful	-0.478	-1.157	1.481	0.427	-1.740*	-1.858*
	(0.563)	(1.105)	(1.134)	(1.493)	(0.903)	(1.082)
R-Squared	0.995	0.982	0.985	0.963	0.985	0.990
	100 × Log Jobs per Capita					
Panel B:	Manuf.	Goods Produce	NR Mining	Construction	Trade Transp.	
	(7)	(8)	(9)	(10)	(11)	
Post Shooting	2.246	0.665	0.074	-0.306	-0.409	
	(3.768)	(2.364)	(5.737)	(2.552)	(1.559)	
Successful	-4.743	-3.165**	-6.362	-3.099	-0.787	
	(3.318)	(1.520)	(4.236)	(2.500)	(0.765)	
R-Squared	0.971	0.970	0.982	0.944	0.986	
Observations	2,070	2,070	2,070	2,070	2,070	2,070

Notes: The Table shows results from an OLS estimation of Equation 3 using data from the Quarterly Census of Employment and Wages (QCEW). The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variables are 100 × the natural logarithm of ratio of jobs to population for the following industries: service-providing (Col. 1), professional and business services (Col. 2), education and health services (Col. 3), other services (Col. 4), leisure and hospitality (Col. 5), financial activities (Col. 6), manufacturing (Col. 7), goods-producing (Col. 8), natural resources and mining (Col. 9), construction (Col. 10) and trade, transportation, and utilities (Col. 11). The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Successful," which is equal to one after a successful mass shooting and zero otherwise. All estimates include county fixed effects, year fixed effects, month-year of shooting fixed effects, and shooting controls. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. The time period is 2000–2015. The standard errors are clustered at the state level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A20: Robustness Checks: Number of Deaths in Failed Mass Shootings

Panel A	100 × Log Jobs per Capita			
	(1)	(2)	(3)	(4)
Post Shooting	1.231	1.245	1.355	1.584
	(1.229)	(1.197)	(1.165)	(1.142)
Success	-2.065***	-2.126***	-2.181***	-1.963***
	(0.501)	(0.511)	(0.518)	(0.524)
R-Squared	0.992	0.992	0.992	0.991
Panel B	100 × Log Real Earnings per Capita			
Post Shooting	3.806**	3.765**	3.849**	3.864**
	(1.845)	(1.855)	(1.797)	(1.846)
Success	-3.098***	-3.049***	-3.162***	-2.956***
	(0.655)	(0.813)	(0.796)	(0.795)
R-Squared	0.993	0.992	0.992	0.992
Panel C	100 × Log Business Establishments per Capita			
Post Shooting	0.897	0.908	1.083	1.045
	(0.958)	(0.894)	(0.887)	(0.912)
Success	-0.993***	-1.259***	-1.387***	-1.253***
	(0.352)	(0.374)	(0.335)	(0.348)
R-Squared	0.993	0.993	0.993	0.993
Failed MS Deaths	0	<=1	<=2	<=3
County FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Shooting Controls	Yes	Yes	Yes	Yes
Law Enforcement	Yes	Yes	Yes	Yes
Month × Year FE	Yes	Yes	Yes	Yes
Observations	1,696	1,915	2,118	2,264

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. Column 1 restricts the sample of failed mass shootings to shootings in which the failed mass shooting lead to no deaths. Similarly, Columns 2, 3, and 4 restrict the sample of failed mass shootings to shootings in which the failed mass shooting lead to 1, 2, and 3 deaths, respectively. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (panel A), 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (panel B) and 100 × the natural logarithm of the ratio of business establishments to population (panel C), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. We also include a dummy for whether the shooting ended because of law enforcement intervention. Employment, earnings and establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A21: Robustness Checks: Omitting Categories of Failed Mass Shootings

Panel A	100 × Log Jobs per Capita					
	(1)	(2)	(3)	(4)	(5)	(6)
Post Shooting	1.307	1.811	1.194	1.766	1.779	1.819
	(1.317)	(1.227)	(1.321)	(1.263)	(1.212)	(1.241)
Success	-1.463***	-1.583***	-1.905***	-1.623***	-1.557***	-1.757***
	(0.492)	(0.464)	(0.532)	(0.544)	(0.558)	(0.534)
R-Squared	0.992	0.992	0.992	0.992	0.993	0.992
Panel B	100 × Log Real Earnings per Capita					
Post Shooting	3.730**	4.179**	3.563*	4.096**	6.417***	4.137**
	(1.814)	(1.736)	(1.805)	(1.751)	(1.789)	(1.736)
Success	-2.519***	-3.302***	-2.846***	-2.990***	-3.070***	-3.286***
	(0.667)	(0.601)	(0.823)	(0.815)	(0.650)	(0.801)
R-Squared	0.993	0.993	0.992	0.993	0.993	0.993
Panel C	100 × Log Business Establishments per Capita					
Post Shooting	0.876	1.120	1.005	1.102	1.746	1.153
	(1.008)	(0.968)	(0.983)	(0.972)	(1.143)	(0.959)
Success	-1.032***	-1.194***	-1.107**	-1.448***	-1.009***	-1.520***
	(0.363)	(0.302)	(0.415)	(0.329)	(0.293)	(0.333)
R-Squared	0.993	0.993	0.993	0.993	0.994	0.993
Reason for Failure	Fled	Subdued	Police	Suicide	Non-Police	Subdued or Suicide
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	Yes	Yes	Yes	Yes	Yes	Yes
Month × Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,619	1,588	1,825	1,800	1,350	1,911

Notes: The Table shows results from an OLS estimation of Equation 3. The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and five years prior to the shooting are included. Column 1 restricts the sample of failed mass shootings to shootings in which the perpetrator fled the scene before law enforcement arrived. Column 2 restricts the sample of failed mass shootings to shootings ending because a citizen(s) restrained or subdued the perpetrator. Column 3 restricts the sample of failed mass shootings to shootings ending with law enforcement intervention. Column 4 restricts the sample of failed mass shootings to shootings that ended with the perpetrator committing suicide before law enforcement arrived. Column 5 restricts the sample of failed mass shootings to shootings that did not end with law enforcement intervention. Last, in column 6, we restrict the sample of failed mass shootings to shootings ending because a civilian(s) restrained or subdued the perpetrator or the perpetrator committed suicide before law enforcement arrived. The dependent variables are 100 × the natural logarithm of the ratio of jobs to population (panel A), 100 × the natural logarithm of the ratio of total real earnings (2005 dollars) to population (panel B) and 100 × the natural logarithm of the ratio of business establishments to population (panel C), respectively. The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Success," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator. Employment, earnings and establishments data are from the County Business Patterns. The time period is 2000–2015. Robust standard errors are in parentheses, adjusted for clustering by state. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A22: Impact of Successful vs Failed Mass Shootings on Private and Government Employment

Panel A	100 × Log Private Jobs Per Capita					
Post Shooting	0.698	1.336	1.142	1.143	1.241	0.849
	(1.229)	(1.308)	(1.121)	(1.121)	(1.193)	(1.315)
Success		-1.551**	-1.683***	-1.685***	-1.476***	-1.606***
		(0.690)	(0.559)	(0.560)	(0.532)	(0.557)
R-Squared	0.991	0.991	0.993	0.993	0.994	0.995
Panel B	100 × Log Business Establishments per Capita					
Post Shooting	-2.984	-1.691	-8.070	-8.061	-6.616	-4.400
	(5.004)	(6.202)	(6.686)	(6.675)	(7.302)	(6.590)
Success		-3.141	-4.001	-4.011	-3.407	-4.136
		(4.262)	(3.787)	(3.785)	(3.631)	(4.142)
R-Squared	0.914	0.914	0.929	0.929	0.933	0.936
County FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Shooting Controls	No	No	Yes	Yes	Yes	Yes
Law Enforcement	No	No	No	Yes	Yes	Yes
Region × Year FE	No	No	No	No	Yes	No
Division × Year FE	No	No	No	No	No	Yes
Month × Year FE	No	No	Yes	Yes	Yes	Yes
Observations 2,070	2,070	2,070	2,070	2,070	2,070	

Notes: The Table shows results from an OLS estimation of Equation 3 using data from the Quarterly Census of Employment and Wages (QCEW). The sample is restricted to counties with either a successful or failed mass shooting. Only county-year observations up to four years after the shooting and six years prior to the shooting are included. The dependent variables are: 100 × the natural logarithm of the ratio of private jobs to population (Columns 1–3) and 100 × the natural logarithm of the ratio of government jobs to population (Columns 4–6). The main independent variables are "Post Shooting," which is equal to one after either a successful or a failed mass shooting and zero otherwise, and "Successful," which is equal to one after a successful mass shooting and zero otherwise. Shooting controls include the age and gender of the perpetrator and dummies for the weapon used during the shooting. Columns 4–6 include a dummy for whether the shooting ended because of law enforcement intervention. The time period is 2000–2015. The standard errors are clustered at the state level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A24: Impact of Successful vs Failed Mass Shootings on Poor Health

	Poor Health (1)
Male	-0.177***
	(0.066)
Age	-0.013
	(0.024)
Age Squared	0.029
	(0.028)
Elementary School	0.465***
	(0.113)
Att. High School	0.687***
	(0.100)
High School	0.411***
	(0.055)
Att. College	0.353***
	(0.066)
Married	-0.430***
	(0.043)
Divorced	0.053
	(0.050)
Widowed	-0.328***
	(0.067)
Separated	0.333***
	(0.077)
Couple	-0.255***
	(0.098)
Observations	27,030
County FE	Yes
Year × Month FE	Yes

Notes: The Table shows results from Poisson estimation of Equation 5. The sample is restricted to counties with either a successful or failed mass shooting. We exclude respondents who are more than 65 years old and respondents who report being disabled, homemaker, retired or student. We rely on 12 months of observations pre- and 12 months of observations post-shooting. The dependent variable is based on answers to the question: "During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?" The main independent variable is "Success," which is equal to one after a successful mass shooting and zero otherwise. The survey data is taken from the Behavioral Risk Factor Surveillance System. The time period is 2000–2012. Individual sampling weights are used. The standard errors are clustered at the state-level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A25: First stage: Impact of Natural Disasters on Media Coverage

	(1)	(2)	(3)	(4)
	Number of News Stories		Duration of News Stories	
Natural Disaster	-3.354**	-2.966**	-10.455**	-9.033*
	(1.465)	(1.421)	(5.261)	(5.048)
ln(City News Stories)	-1.652	-1.595	-0.794	1.005
	(2.102)	(2.075)	(7.678)	(7.666)
Shooting Victims	0.319	0.311	0.901	0.874
	(0.204)	(0.199)	(1.094)	(1.082)
Disaster Total Affected		-39.477		-144.740
		(41.744)		(153.979)
Observations	177	177	177	177
R-Squared	0.947	0.953	0.981	0.983
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Division × Year FE	Yes	Yes	Yes	Yes
Montiel-Pflueger F Stat	10.149	8.645	6.778	5.460

Notes: The Table shows estimates of the first stage (Equation 7). The sample is restricted to counties with a successful mass shooting. Only county-year observation in the year of the shooting are included. The dependent variables are the number of news stories in Columns 1 and 2, and the total duration of news coverage in Columns 3 and 4. "Natural Disaster" is a dummy variable equal to one if there was a natural disaster in the U.S. on the exact date of the shooting and zero otherwise. The variable "ln(city news stories)" is the natural logarithm of the number of news stories about the city where shooting takes place. The variable "Shooting Victims" counts the number of individuals (not including the shooter(s)) killed in the shooting and "Disaster Total Affected" is the total number of people affected by the natural disaster. News coverage data is collected from the Vanderbilt Television News Archive. Natural disasters data is collected from the Emergency Disaster Database (EM-DAT). The time period is 2000–2015. The standard errors are clustered at the county level. * indicates significance at 10% significance level, ** indicates significance at 5% significance level, while *** indicates significance at 1% significance level.

Table A26: Socioeconomic Characteristics of Shooters and Right-to-Carry Laws

	All States	States With RTC Law	States Without RTC Law
Risk Factors			
Financial Distress	39%	36%	46%
Family Violence	39%	42%	32%
Religious/Racial	17%	16%	21%
Political	4%	6%	0%
Social Rejection	4%	1%	11%
School Failure	4%	4%	4%
Other & Unknown	15%	16%	14%
	All States	States With RTC Law	States Without RTC Law
Employment			
Employed	42%	40%	46%
Student	12%	12%	13%
Unemp. or Out Labor	46%	48%	41%
Schooling			
Some High School	24%	32%	7%
Grad. High School	22%	29%	7%
Some College	33%	26%	50%
Grad. College	20%	13%	36%
Martial Status			
Married/Partner	42%	44%	35%
Divorced/Separated	29%	30%	26%
Single	29%	24%	39%
Child	41%	43%	33%
Race			
White	51%	55%	41%
Black/African Ame.	23%	25%	19%
Other (or Two) Race	26%	20%	40%
Demographics			
Age	34	33	36
Born U.S.	81%	86%	69%
Male	95%	97%	89%
Mental Illness	43%	45%	39%
Military	19%	19%	18%
Place of Residence	96%	100%	87%
Total Observations	97	69	28

Notes: We collect socioeconomic characteristics for a total of 97 mass shootings. Mass shootings are defined as shootings leading to at least four deaths, excluding the shooter. Right-to-carry adoption dates are from Donohue et al. (2019). Data on age and gender were obtained for all perpetrators. Information on the educational attainment, employment status and marital status were obtained for 45, 74 and 77 perpetrators, respectively. For some mass shootings, multiple risk factors were documented. "Financial Distress" includes being recently fired from job, history of financial difficulties and financial dispute with the victim(s). "School Failure" includes expulsion, suspension or failing classes. "Social Rejection" includes bullying or parents' divorce. The variable "Mental Illness" equals one if the perpetrator had a mental disorder, a history of mental illness or suffered from sever depression. "Military" equals one if the perpetrator was or used to be in the military. Mass shootings classified as "Other & Unknown" include, for instance, gang-related incidents, military-related incidents and misogyny. The last column reports summary statistics from the 2010 American Community Survey for male Americans aged 25–45. Data on metal health comes from the Substance Abuse and Mental Health Services Administration. Data on military is from the Department of Veterans Affairs. Data on fertility is from the Current Population Survey.