The Effect of Mass Shootings on Background Checks in the United States

Trevor Rhys, Robert Talley, and Walker Weatherly

Introduction

Mass-shootings occur in the United States on a near daily basis, and data shows an increase in background checks for firearms purchases in the following months of a mass-shooting. Using a time-series model, we study the impact of the nine most severe mass-shootings in the US in the past 20 years on national background checks, which we use to proxy for firearms sales. We find that mass shootings increase the number of background checks reported by the National Institute of Crime Statistics in the following months with the greatest spikes occurring after a shooting in which the shooter had pre-existing mental health issues and was not born in the US. We also find that the severity of the shooting, specifically injuries, led to a higher increase in background checks.

In our research, we found that population and unemployment were not statistically significant in the models that were run. Statistically significant variables that were found from our model were the mass shooting variable, international terrorism, mental health, and injuries. The variable of house majority was seen to be significant but only during the first lag period with the Senate majority and Presidential party showing no significance.

Literature

The 1996 Dickey Amendment, lobbied for by American gun advocacy organizations, prevented federal funding for the CDC to continue researching gun violence. Because of this, gun violence literature is sparse, and comes primarily in the form of academic and empirical papers. Callcut et al. (2019), as well as a paper by Chau (2018) are the blueprints for our paper, as they both consider the same question: Is there a statistical significance between mass shootings and firearm sales in the United States? In addition to these, a paper by Liu et al. (2019) provides an understanding for the time-series regression model we use. Stroebe et al. (2017) and Luca et al. (2016) introduce the importance of the political party in office at the time of a mass shooting and how this, as well as changes in gun control, are important to consider when proving the statistical significance of mass shootings on background checks. All of these papers find that mass shootings increase the amount of background checks in the months following the shooting, and the most significant factors that increase background checks are the severity of the shooting and foreign nationality of the shooter.

Data

Our data on background checks was gathered from the National Instant Criminal Background Check System (NICS). This is a database run by the FBI, which has catalogued every firearms background check dating back to 1999, recorded monthly. We gathered data on unemployment from the Bureau of Labor Statistics, to define the economic status of the country. Our population data was taken from the U.S. Census Bureau to provide the most accurate estimates on the population. Injury and fatality data come from Mother Jones. All dummy variables δ, are binary where 1 represents democrat for house, senate and presiden, yes for preexisting mental health conditions, and international for terrorism.

Conclusion

The US must find new ways to prevent people from purchasing firearms that pose a risk to the public. There has not been much political action limiting the freedom of firearms purchases, and one deciding factor of this is the congressional decision in 1996 to abandon government funding to the CDC for research on gun violence and better document the factors that caused each shooting. The Biden Administration has proposed several forms of legislation that will hopefully close existing loopholes in the current background check system. This topic has many variables that vary in values due to differing ways of defining mass shootings, as well as the difficulty in getting data for exact dates and times of shootings. Future research in this topic will need to find a way to make certain variations more consistent by using a time specific dummy variable allowing for lower variation.

Model

$$\beta_0 Checks_t = \beta_1 Population_t + \beta_2 Unemployment_t + \beta_3 Injuries_t + \beta_4 Fatalities_t +$$

$$\delta_0 Shooting_t + \delta_1 MentalHealth_t + \delta_2 Terrorism_t + \delta_3 DemocraticPresident_t +$$

$$\delta_4 DemocraticHouse_t + \delta_5 DemocraticSenate_t + \varepsilon_t$$

Results

In our research, we find that population and unemployment were not statistically significant in the models that were run. Statistically significant variables that we find multiple variances from our model were the mass shooting variable, international terrorism, mental health, and injuries. The variable of house majority was seen to be significant but only during the first lag period with the Senate majority and Presidential party showing no significance.

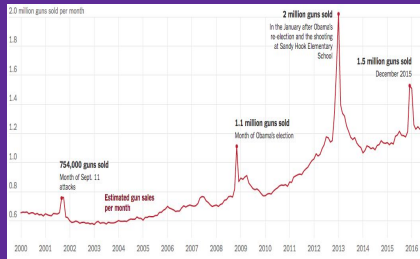*Figure 1.1. The New York Times graphic illustrating keystone events and gun sales*

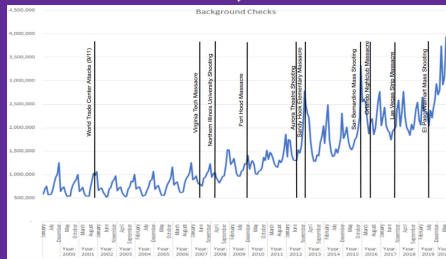*Figure 1.2. NICS Background Checks data from 1999-2020 with lines showing each Mass Shootings being used in the study.*

Table 2.1. Summarized Statistics on our variables

	Observations	Mean	SD	Minimum	Maximum
Background Checks	261	1382899	718595.1	518351	3931607
Log & Difference Checks	261	14.0104	0.5069	13.1584	15.1845
Population	263	12.6334	0.0516	12.535	12.7102
Unemployment	265	1.7284	0.3044	0	14.8
Injuries	9	122.8889	279.9109	2	867
Fatalities	9	28.5556	16.9345	12	61
Shooting	9	0.033962	0.181475	0	1
Mental Health of Shooter	8	0.75	0.4629	0	1
Terrorist Affiliation	7	0.2857	0.4879	0	1
Democratic President	264	0.3674	0.483	0	1
Democratic House	264	0.2273	0.4199	0	1
Democratic Senate	264	0.4546	0.4989	0	1

Table 2.2. Results
$* p<0.10; ** p<0.05; *** p<0.01$

Background Checks	Model 1	Model 2	Model 3	Model 4	Model 5
Population	123.10				110.41
	112.29				56.952*
Unemployment	-0.0537				-0.1382
	329367.8				0.0964
Injuries		0.0003	0.0003		0.0005***
		0.0001	0.0002		0.0001
Fatalities		-0.0021	-0.0031		-0.0015
		0.0015	0.0028		0.0009
Shooting		0.0584	-0.0370	0.1422	0.0143	-0.1321
		0.0390	0.0643	0.0756*	0.0395	0.0749*
International Terrorism			0.0558		0.0966
			0.0379		0.0269**
Mental Health			0.0868		0.1422
			0.0533		0.0734*
Democratic President				0.0047	0.0081
				0.0164	0.0236
Democratic House				0.0050	0.0120
				0.0175	0.0233
Democratic Senate				-0.0054	-0.0131
				0.0176	0.0244