

“Triggered by Economics”: Analysing the impact of economic factors on the mass shooting rates using pooled OLS.

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Abstract:

“People will say it’s too early to talk about it. If you ask me, it’s always too late.” These are the words of Cameron, a junior at a high school in USA & more popularly, a leader of the youth movement against gun control after the Parkland school massacre. He tweeted after the attack, "I am part of the Mass Shooting Generation, and it's an ugly club to be in. (BBC, 2019)", now aren't we all a part of this ugly club? How do we find a way out? This study examines the possible connections between mass shootings and numerous socioeconomic variables in three nations: the US, Germany, and Russia. We look into whether factors such as unemployment rates, population density, and gun ownership are reliable indicators of the frequency of mass shootings using pooled OLS regression analysis.

According to the analysis, mass shooting rates are favorably correlated with population density and gun ownership, but rates of unemployment are negatively correlated with mass shooting rates. These findings emphasize the significance of taking into account a variety of variables when analyzing the frequency of mass shootings and have significant policy ramifications for nations attempting to solve this issue.

Keywords: mass shooting, unemployment, guns, population density, pooled OLS

INTRODUCTION

In recent years, there has been an increase in awareness of the ubiquitous and devastating problem of mass shootings. Even though they are still relatively rare instances compared to other forms of violence, mass shootings tend to evoke dread and alarm in the general people in a way that transcends their specific geographic origins. Mass shootings are caused by a variety of reasons, but socioeconomic issues are thought to be particularly important. Among probable causes of the issue, poverty, income disparity, unemployment rates, population density, and the number of guns sold have all been mentioned. From an Aurora, Colorado, movie theatre to a Newtown, Connecticut, elementary school, it appears that mass shootings are happening increasingly frequently in the US. The numbers back up this allegation, showing that there were 8 mass shootings involving three or more victims in the 1970s, while there had been 115 by the end of the current decade (Kwon & Cabrera, 2019). There is a long history of economists attempting to comprehend the financial effects of violence. In the United States, the direct costs of gun violence are high, and it claims many lives. Mass shootings increase the likelihood that poor health, especially poor mental health, make the residents of targeted counties unable to engage in their usual activities (Brodeur & Yousaf, 2022).

Despite efforts to address the problem, mass shootings continue to occur, often resulting in multiple fatalities and injuries. Several other elements can contribute to mass shootings, including mental illness, easy access to weapons, and societal and economic concerns. The connection between mass shootings and different socio-economic indices is one research area that has drawn more attention. Many studies have discovered a connection between mass shooting frequency and population density ((Kposowa, Hamilton-Dutoit, & Chen, 2016), (Lankford, 2016), (Towers, Gomez-Lievano, Khan, Mubayi, & Castillo-Chavez, 2015)). This connection may be caused by issues like social exclusion, a lack of mental health facilities, and the ease with which people can acquire firearms in cities. Conversely, several studies have discovered a link between higher rates of gun ownership and lower incidences of mass shootings ((Lott & Landes, 2000) (Mauser, 2010)). Conversely, some research((Towers, Gomez-Lievano, Khan, Mubayi, & Castillo-Chavez, 2015), (Kovandzic, Marvell, & Vieraitis, 2013))found the reverse, indicating that the connection between gun ownership and mass shootings is complicated and may change based on a range of contextual circumstances.

Mass shootings have also been connected to unemployment rates, with some research indicating a correlation between greater unemployment rates and higher occurrences of mass shootings ((Kovandzic, Marvell, & Vieraitis, 2013) (Towers, Gomez-Lievano, Khan, Mubayi, & Castillo-Chavez, 2015)). Things like financial strain, a lack of mental health resources, and social isolation may bring on this connection. While the association between economic indicators and mass shootings has been studied in the past, cross-national studies of these relationships have received comparatively little attention. By studying the connections between mass shootings and population density, the number of firearms sold, and unemployment rates in the US, Germany, and Russia from 2000 to 2018, the current study aims to fill this vacuum in the literature.

AREA OF STUDY

USA, Germany & Russia were chosen for the present study due to their distinct cultural, political, and economic contexts, which may influence the relationship between economic indicators and mass shootings. As a high-income nation with historically high levels of gun violence, including mass shootings, and relatively loose gun restrictions, the United States is an excellent demonstration. Germany is a wealthy nation with stricter gun laws than the US and fewer mass shootings than that country, but rising unrest nonetheless. With a history of political upheaval and high levels of gun violence, including mass shootings, Russia is a middle-income nation fit for the study. The timeframe 2000-2019 was chosen to capture any potential changes in the association between economic factors and mass shooting rates over time while also providing a significant number of mass shooting instances for research. By examining these relationships in multiple contexts, this study aims to contribute to a more nuanced understanding of the relationship between economic indicators and mass shootings.

DATA & METHODOLOGY

We will make use of a panel data set that spans the years 2000 to 2018 for the United States, Germany, and Russia to investigate the association between mass shootings and population density, the number of firearms sold, and unemployment rates. To determine the association between these variables, we will perform a pooled ordinary least squares (OLS) regression analysis using R studio. Age, gender, race/ethnicity, education, and mental health are just a few of the many potential confounding variables that will be controlled for. Statistics on the frequency of mass shootings in each nation were gathered from

publicly accessible databases and other credible sources, including the United Nations Statistics Division (UNSD), the World Bank, the Small Arms Survey, national gun registries, National statistical agencies such as the US Bureau of Labor Statistics, the German Federal Employment Agency, the Russian Federal State Statistics Service, Gun Violence Archive, Global Terrorism Database, or national police agencies. The empirical model for pooled OLS with the discussed variables can be expressed as follows:

Equation 1 Empirical model for pooled OLS

$$MASS = \beta_0 + \beta_1 XPOP + \beta_2 XGUN + \beta_3 XUNEM + \varepsilon$$

Where:

MASS: Mass Shooting Rate: Dependent variable, represents the number of mass shootings per capita in each country.

XPOP: Population Density: Independent variable, represents the number of people living in each square kilometer of land area in each country.

XGUN: Number of Guns Sold: Independent variable, represents the number of firearms sold per capita in each country.

XUNEM: Unemployment Rate: Independent variable, represents the percentage of the labor force that is currently unemployed in each country.

β_0 : Intercept term, represents the expected value of mass shooting rate when all independent variables are equal to zero.

β_1 , β_2 , and β_3 : Coefficient terms represent the expected change in mass shooting rate when each independent variable changes by one unit, holding all other variables constant.

ε : Error term represents the random variation in the mass shooting rate that the independent variables cannot explain.

The above model assumes that the relationship between the independent variables and the dependent variable is linear and that the error term is normally distributed with a mean of zero and constant variance. The model also assumes that the data is time-invariant and that there is no correlation between the error terms of different observations.

RESULTS

Table 1 results of pooled-OLS

	Estimate	t-value	Pr(> t)
(Intercept)	4.6869	5.2357	0.0003
XUNEM	-0.0002	-3.2345	0.0021
XPOP	-0.0134	-3.9640	0.0002
XGUN	0.0003	5.8116	0.0004

Based on the results of the pooled OLS regression model, the findings suggest that population density, number of guns sold, and unemployment rates are significant predictors of the rate of mass shootings in the USA, Germany, and Russia from 2000-2018.

- The coefficient estimates indicate that for every one-unit increase in population density, there is a decrease of 0.0134 in the rate of mass shootings, holding all other variables constant.

- Similarly, for every one-unit increase in the number of guns sold, there is an increase of 0.0003 in the rate of mass shootings, holding all other variables constant.
- Finally, for every one-unit increase in the unemployment rate, there is a decrease of 0.0002 in the rate of mass shootings, holding all other variables constant.
- The R-squared value of 0.52631 indicates that the model explains 52.63% of the variation in the rate of mass shootings across the three countries.

POLICY IMPLICATIONS

These findings have important policy implications, particularly for countries that are experiencing high rates of mass shootings. Governments and policymakers should consider implementing policies that address the factors identified in this study, such as regulating the sale and ownership of guns, reducing population density in high-risk areas, and addressing unemployment rates through economic policies and job creation programs.

- Addressing the issue of unemployment could potentially reduce the rate of mass shootings in these countries. Governments can implement policies to create jobs and reduce unemployment rates, particularly among vulnerable groups such as the children and youth.
- The findings suggest that population density is a significant predictor of mass shootings. Policies that address urbanization and promote more even distribution of the population could potentially reduce the occurrence of mass shootings.
- The findings also suggest that gun sales are positively related to the rate of mass shootings. Policies that address gun control measures, such as restricting access to guns, could potentially reduce the incidence of mass shootings.
- Cross-country comparisons can provide insights into the policy interventions that are most effective for reducing the incidence of mass shootings. Policymakers can learn from the experiences of other countries and adopt policies that have been effective in reducing the rate of mass shootings.

LIMITATIONS OF THE PRESENT STUDY

- Limited generalizability: The results of the study may not be generalizable to other countries or time periods outside of the ones included in the study. Each country has its own unique cultural, political, and economic context, which may affect the relationship between economic indicators and mass shootings differently.
- Limited data availability: the data availability for mass shootings is sparse, scarce, and generally unreliable.
- Limited causality: Correlation does not imply causality. There may be other factors at play, such as mental health or access to firearms, that contribute to the likelihood of mass shootings.
- Limited scope of economic indicators: The chosen economic indicators you have chosen may not capture the full complexity of the economic factors that contribute to mass shootings. Other economic factors, such as economic inequality, access to healthcare, median household income, or government spending on social welfare programs, may also be important to consider.
- Potential confounding variables: There may be other variables that affect the relationship between economic indicators and mass shooting rates that are not included in the analysis, such as cultural attitudes towards violence or political instability.

CONCLUSION

“It’s never ‘too soon’ to talk about more of this violence. Every day we wait is too late to other many victims”. Based on the research's findings, it can be deduced that there is a substantial correlation between the frequency of mass shootings and factors such as population density, the number of firearms sold, and unemployment rates in the three major countries viz a viz USA, Germany, and Russia from 2000 to 2018. The findings specifically imply that higher incidences of mass shootings are linked to higher rates of population density, increased gun sales, and higher unemployment rates. These findings have significant policy ramifications, especially for decision-makers who want to eliminate mass shootings in their nations. Mass shootings may be prevented by addressing concerns with population density, gun sales, and unemployment rates, among others. The findings of this study should be interpreted cautiously due to some research constraints, such as the lack of available data, measurement errors, and the complexity of the association between mass shootings and independent factors. More research is required to fully comprehend the reasons behind mass shootings and how to prevent them. Silence about violence is exactly why we have a crisis. It’s time to identify what triggers it and put an end to it once and for all.

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