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Mass Shootings and the Performance of Tourism Stocks

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Abstract:

This study investigates the effects of mass shooting events on the performance of the tourism industry within the United States. The results of the study show that outside of the market-wide returns, the performance of tourism stocks is negatively impacted after a large-scale mass shooting event. Furthermore, when separating extreme outliers in the data such as the Las Vegas Mandalay Bay shooting, the results of the study find that tourism stocks surrounding other large-scale mass shootings are significantly negative. Overall, the results of the study demonstrate a negative response in the tourism industry to large-scale mass shootings.

Keywords: Mass Shootings, Tourism, Stock Prices, Event Study

1. Introduction

The United States travel and tourism industry is one of the largest industries in the United States encompassing 7.8 million jobs and accounting for more than $1.6 trillion in economic output in 2017 alone.[1] Since the travel and tourism industry is one of the country's largest export sectors, understanding how it is affected and what drives its performance can be vital to the overall health of the nation and its job market.[2] Many things could ultimately influence a person's outlook of tourism and travel-based on events that are happening in and around the United States and those areas of tourism. This outlook can ultimately affect the performance of the firms found within the tourism industry. These affecting factors can emerge as many different things from weather and climate to increases in the level of crime and safety in popular tourist destinations.

This paper seeks to understand a specific area of crime namely mass shooing events and how they can affect the performance of firms found within the tourism industry. Previous literature has investigated the tourism industry and its effects on crime rates such as the study done by Pizam (1982). Some studies have even looked at serial murders effect on the tourism industry, finding that tourism behavior is reduced due to fear of the serial murder.[3] The interest of this study lies with the specific cases of mass shootings around the United States and their effect on the performance of tourism firms' stock prices.

The hypothesis that is tested throughout this current study is that large mass shooting events categorized by the number of victims involved will produce a larger negative shock on the performance of the tourism stocks than smaller events represented by total victims count. This idea is based on previous literature, that media coverage of crime saturated television news is related

[1] International Trade Administration, Industry and Analysis, National Travel and Tourism office (2018)
[2] Xenias and Erdmann (2011)
[3] Gibson (2006)

to increased fear and concern for crime.[4] Driven by the idea from Duwe (2005) that news stations disproportionally cover unusual, dramatic, and violent crimes and would more intensely and extensively cover large-scale mass shootings this would produce a greater fear response and a "contagion" effect within the tourism industry as people choose to travel and recreate less.[5] The "contagion" effect will be discussed in the following section.

2. Motivation

Much of the previous literature has looked at the effects of tourism on crime and crime rates. Some of the literature has found no correlation between tourism and crime such as the study done by Pizam (1982). It states that "on a national basis there seems to be no support to the argument of causality or positive correlation between the two (page 10)." However, in contrast McPheters and Strong (1974) found that in Miami, Florida crime can be considered an "externality, or by-product, of the tourist industry: increased tourism causes additional crime (page 7)." Although many studies are contradictory about tourism causing increased crime, fewer studies have been done to look at these effects in the opposite direction, the effect of crime on tourism. Gibson (2006) performed a study in which he looked at the effect of serial murder and its effect on the tourism industry. He states that "serial murder causes public fear, which in turn depresses consumer behavior (page 48)", and that in general "serial murder is bad for tourism (page 48)."

The main idea behind why large-scale crime such as serial murder may have a negative impact on the tourism industry is due to an effect called the "contagion" effect that was outlined by Ho, Qiu, and Tang (2013). Their study looked at the effects that aviation disasters had on the travel industry and explained that the "contagion" effect "arises when the tragic air crash news

[4] Romer, Jamieson and Aday (2006)
[5] Ho, Qiu and Tang (2013)

also influences the business of the non-crash airlines if it provokes the general public's concern for air-travel safety, which results in a decline in the overall air travel demand (page 113)" This idea is taken and used as an underlying hypothesis in this study testing if a mass shooting event is substantially large, the overall fear and concern from the public will cause a decrease in tourism stock performance as a "contagion" effect spreads to the entire industry regardless of the location of the mass shooting. It is believed that this effect will take place because of the disproportional news coverage of larger mass shootings.[6] Duwe (2005) states that reporting entities "deliberately select unusual and dramatic typifying examples (of crime) to galvanize the public and attract policymakers' attention (page 61)."

While existing literature has documented the effects of tourism on crime and the effects of serial murder on tourism behavior, this study will contribute to the literature by seeking to understand the effect that mass shootings will have on the performance of tourism stocks. The results will help to support the previous literature findings that crime such as mass murder and serial murder do negatively impact the tourism industry.

3. Data.

The primary data that was used in the study was gathered from a database of information on mass shootings from the year 1982 to 2019 that was compiled from Motherjones.com. Their database included variables such as the location of the event, the date that the event took place on, how many victims were involved in the event, both fatalities and non-fatal injured victims, the weapon type that was used in the event and if that weapon was obtained legally. Pricing data was also gathered from the Center for Research on Security Prices (CRSP). That data was accessed

[6] Duwe (2005)

and obtained through the Wharton Research Data Services (WRDS). To determine which firms would be included in the study, SIC codes were obtained from CRSP for our grouping of tourism firms.

Reported in Table 1 are the SIC codes for the chosen firms, which were separated into three categories based on the industry. The first classification of SIC codes (4724, 4725,4729, and 4789) are grouped by the travel and transportation industry. The second group of SIC codes (7011, 7021, and 7033) all fall into the lodging industry. The final group consisted of SIC codes in the major category 7900 to 7999, fall within the amusement and recreation services industry.

Table 2 reports the summary statistics for the variables that were acquired from the CRSP[7] and the Mother Jones[8] database. The market capitalization (MktCap) is the size of the firm being represented by price multiplied by shares outstanding. Price is the CRSP closing price. Volatility is the difference between the natural log of the intraday high and the intraday low price on the day of the event. Turnover is the amount of daily volume of shares outstanding. Victims is the amount of non-fatal injured and fatalities from the shooting. Legal gun is a binary variable that is equal to one if the firearm that was used in the event was obtained legally. The classification of firearms; handgun, shotgun, revolver, and assault weapon (aslt weapon) are binary variables that are equal to one if that type of firearm was used in the event. Similarly, workplace, school, church, and military are binary variables that are equal to one if the event took place in that location. The average firm size in the study is $3.4 billion, with an average closing price of $24.59, a volatility of 3.96%, and a turnover of 64.23%. Between 1982 and 2019 the average victim count for the events in the study was 19.68, with handguns being involved in 75.78% of events with assault

[7] Wharton Research Data Services (2020)
[8] Follman , Aronsen and Pan (2020)

weapons being used in only 16.46% of mass shootings. 33.33% of all events took place in a workplace location.

Table 3 reports a correlation matrix of various variables in the study. The correlation between the variables can take on a value between negative one and positive one. The same variables and their respective abbreviations have been mentioned above at the beginning of the data section. An important correlation to note is the 50.87% correlation between assault weapons and victims this being the largest correlation represented in Table 3. The variable victims is also highly correlated to price at 16.31%, and volatility with a -13.61%.

4. Empirical Findings.

In the following section standard event studies were performed using the data gathered from CRSP, and SICCODE.com around the event days of the mass shootings provided from MotherJones.com. Data from the Las Vegas Mandalay Bay shooting was then separated from the full dataset to make sure that the results of the previously mentioned event studies were not driven solely by the Vegas shooting. Finally, two multivariate tests were performed, one with the Vegas event included into the full dataset and a second with the separated Vegas data to determine if a specific variable (i.e. location, firearm, victim count, etc.) was ultimately the cause of the abnormal returns found in the event studies. In estimating the abnormal returns of the firms, the following equation was used:

$$R_t = \alpha + \beta Rm_t + \varepsilon_t$$

The dependent variable is the return of the individual firm for each day *t*. The independent variable is the return from the market and the residual, ε_t, is the raw return outside of the market-

wide return. When running the event study, two methods were used to perform the univariate tests: value-weighted and equally weighted. The CAR numbers that have been reported in Tables 4 – 8 are only those values from the value-weighted univariate test, due to the higher significance produced compared to the equally-weighted univariate test.

4.1 Univariate Tests – By Firm, Firearm, and Location

Table 4 shows the cumulative abnormal returns (CARs) for windows of time around the event dates. These windows range from (-1,1), a three-day period starting the day before the event to one day after, up to (0,5) a six-day window around the event date starting on the day of the event and going to five days after. Along with the CARs for all the firms used in the study, Table 4 divides the CARs by Lodging, Travel, and Recreation firms that encompass the tourism industry. Looking at all firms, the CAR values are only significant in three of the five time windows ((-1,1), (0,1), 0,3)), and are found to be positive. This positive relationship contradicts the a priori assumption demonstrated by Gibson (2006) when it was found that murder negatively impacts tourism behavior. The idea that mass shootings would negatively shock the abnormal returns of the tourism industry around the event dates however does not hold. When divided into industry-specific categories only five of the 15 combinations between the event windows and the lodging, travel, and recreation firms are found to be positive and significant, suggesting that mass shooting events do not negatively affect any one specific firm type (i.e. Lodging, Travel, Recreation), when separated, within the tourism industry.

While the separated firm type shown in Table 4 does not denote any negative and significant results from the first event study, Table 5 begins looking at the CARs according to specific variables from the data, starting with the type of firearm used in the event. When dividing the CARs by firearm type the results mimic with those found above in Table 4. There is no

significant negative result shown by the type of firearm used. Again, the results by type of firearm are positive signifying that any firearm used in a mass shooting causes the abnormal returns of tourism firms to increase around the time of the event. The only negative and significant value is CAR(0,2) under the assault weapon column, with a value of -0.0031 with a *t*-statistic of -1.7318. However, that negative impact on the tourism industry is not shown in any other CAR time window within the assault weapon column.

Although no major findings have been reported in Table 4 – 5, Table 6 does provide a very surprising result when separating the CARs by event location. The MotherJones dataset separated the event locations into four different categories: workplace, school, religion (church), and military. When looking at the affect that location of the event may have on the tourism industry's CARs; workplace, school, and religion suggest no significant impact based on the shooting location. However, when looking at the events that took place in a military location all CARs beginning on the event day and up to five days after are shown to be significant at the 0.001 level. The CARs range from -0.0080 with a *t*-statistic of -3.2007 in the CAR(0,1) window to -0.0174 with a *t*-statistic of -4.5962 in the last CAR(0,5) window. This may be causing a negative effect on tourism since four of the five military mass shootings occurred in states found to be in the top 13 most popular states to visit within the U.S.: Texas, Tennessee, and Washington D.C..[9]

4.2 Univariate Tests – Non-Vegas and Vegas Event Victims Separated

As firm, firearm, and location have not shown many significant CARs from the event study, Table 7 looks at the events according to the victim count involved in the mass shootings. The hypothesis being tested in this section is that higher victim counts will have larger shock effects

[9] Polland (2014)

on the performance of the tourism industry over events with small numbers of victims. This hypothesis is based on the "contagion" effect outlined by Ho, Qiu and Tang (2013). Victim counts have been separated into three categories: low, middle, high. The low victim classification includes all events with less than six victims, middle victim included all events with at least six victims and up to 34 victims, and the high victim grouping is any event with more than 34 victims.

Table 7 shows that events with low victim counts do not significantly affect that CARs of the tourism industry, this may be because of the "switch" effect overpowering the "contagion" effect when the event has a lower fatality rate as people are simply deciding to travel to locations not affected by the event.[10] However, when looking at events that involved a high victim count, the CAR results are reported as negative and significant from the day of the event up to five days after the event. These CAR values range from -0.0045 with a *t*-statistic of -1.8282 in the (0,1) window to -0.0092 with a *t*-statistic or -2.8707 in the (0,5) CAR window. While it is clear that the negative affect to the performance of the tourism industry increases as the time window widens, the increase comes at a decreasing rate with the largest shock reported by CAR(0,1) at a -0.45% decrease. When annualized this would represent a 57% underperformance of tourism firms. Although the CAR(0,5) window does show a slightly lower absolute underperformance of tourism firms at 0.92%, annualized would still signal an underperformance of nearly 39%. With a window of possible underperformance from 39 to 57% annually, averaging the two CAR windows would represent an annual underperformance of 48% in tourism firms. Again, all the CARs from the day of the event up to 5 days after are all negative and significant.

[10] Ho, Qiu and Tang (2013)

Although the results from a mass shooting event involving a high victim count are significant and negative, it was important to examine those results after removing the Las Vegas Mandalay Bay shooting, due to the exceedingly large number of victims involved in the event. 604 victims were reported to be involved in the Vegas shooting. This event was an outlier in the data since the next largest event by victim count involved 102 victims. With the Vegas event separated from the data, Table 8 again looks at the victim count of the events. Table 8 has been split into three columns, column one is looking solely at the Vegas event high victim count, column two reports the high victim events not including the Vegas event, and column three reports the non-high victim (middle and low victim combined) events not including the Vegas event. This was done to establish that the finding from Table 7 were not simply a produce of the large outlier Vegas event.

As shown in Table 8 the CARs from the Vegas event are much larger than the non-Vegas events from one day before the event up to two days after, and in each case almost doubling the CARs in the high victim events without Vegas. Nonetheless, the CARs for the high victim events excluding Vegas are still found to be statistically significant and negative from CAR(0,2) to CAR(0,5). Even when removing the Vegas event, the high victim CARs are found to be almost the identical values as the CARs found in Table 7. To illustrate, CAR(0,5)'s -0.97% for non-Vegas high victim events annualized would represent -41% return to firms in the tourism industry. This is similar to the -39% found in Table 7. Although the mass shooting that took place in Las Vegas produced a large negative shock to the performance of tourism stocks, equally, all other high victim events also produced statistically significant and negative economically significant shocks to the stock performance of tourism firms.

4.3 Multivariate Tests – All Data Included

After seeing the negative and significant results from the high victim count events, the decision was made to continue the analysis using a multivariate regression to find if any specific factors are driving the CARs to the results that have been previously show. The regression being estimated is as follows:

$$CAR(0,3) = \alpha + \beta_1 Victims + \beta_2 Assault\ Weapon + \beta_3 Legal\ Weapon + \beta_4 Travel + \beta_5 Lodging + \beta_6 Workplace + \beta_7 School + \beta_8 Church + \beta_9 Ln(MktCap) + \beta_{10} Ln(Price) + \beta_{11} Volatility + \beta_{12} Turnover + \varepsilon_i$$

The dependent variable is the four-day CAR window beginning on the day of the event to three days after the event. This CAR was chosen because of its average between all the CARs calculated in the event studies. The independent variables are as follows: victims as the total number of victims involved in the mass shooting events. Assault weapon is a binary variable equal to one if an assault style weapon was used in the event, zero otherwise, it was included due to the sensitivity to the news and media. Legal weapon is a binary variable equal to one if the weapon used in the event was obtained legally, zero otherwise. Travel is a binary variable equal to one if a firm falls under the SIC code of 4724, 4725, or 4729, zero otherwise. Lodging is a binary variable equal to one if a firm falls under the SIC code of 7011, 7033, or 7041 zero otherwise. Workplace is a binary variable equal to one if the event took place in that location, zero otherwise. School is a binary variable equal to one if the event took place in that location, zero otherwise. Church is a binary variable equal to one if the event took place in that location, zero otherwise. Ln(MktCap) is the natural log of the market capitalization (size) of the firms in the tourism industry. Ln(price) is the natural log of the CRSP closing prices of the firms on the event dates. Volatility is difference between the natural log of the intraday high and intraday low price on the day of the event.

Turnover is the amount of daily volume of shares outstanding on the event day. To account for heteroskedasticity, the calculation was performed using the White robust standard errors and are reported in parenthesis.

Table 9 shows the results from the regression equation above. All of the regressions, whether full or reduced, have all the firm specific variables included in the models: Ln(MktCap), Ln(price), Volatility, and Turnover. Columns [1], [2], and [3] are reduced models focusing on victims, assault weapons and legal gun, respectively. Column [4] and [5] focus on firm type and location, with column [6] showing the full regression including all variables. When looking at the first reduced model in column [1] it appears that the CARs for the tourism industry are being driven by the variable victims. As the count of victims increases by one person in an event, the CAR(0,3) window for the firms in the tourism industry decrease by -0.00003, ceteris paribus. Also, on average, the CARs around an event where the perpetrator used an assault weapon are -0.005 less that the CARs around an event when an assault weapon was not used in the shooting. Although the previously reported CARs in Table 5 were not shown to be negatively affected when looking at the CARs according to assault weapons, the results in the Table 9 may be showing this effect from assault weapons from the 50% correlation between assault weapons and victims found in Table 3.

Columns [4] and [5] focused on the variables for firm type and location, respectively. When looking at the insignificant coefficients for firm type and location, it is reported that the CARs are not being driven by either the type of firm in the tourism industry or the location where the event took place.

4.4 Multivariate Test – Las Vegas Data Separated

Similar to the univariate tests performed in section 4.2, the data for Las Vegas was separated from the full dataset and turned into a binary variable equal to one if the event happened in Las Vegas. This was done to test if the industry returns were shown to be more substantial around the Vegas event relative to the other events used in the study. All other included variables remain the same as the previous regression and are outlined and described above in the equation in section 4.3. To account for heteroskedasticity, the calculation was performed using the White robust standard errors and are reported in parenthesis. The following regression was estimated:

$$CAR(0,3) = \alpha + \beta_1 Vegas + \beta_2 Victims + \beta_3 Assault\ Weapon + \beta_4 Legal\ Weapon + \beta_5 Travel + \beta_6 Lodging + \beta_7 Workplace + \beta_8 School + \beta_9 Church + \beta_{10} Ln(MktCap) + \beta_{11} Ln(Price) + \beta_{12} Volatility + \beta_{13} Turnover + \varepsilon_i$$

When including the binary variable for Vegas in column [1] it produces a negative and significant coefficient. However, in column [2], when including the victim count along with the Vegas variable, the sign on the Vegas variable flips to positive suggesting that it wasn't necessarily the shooting in Vegas that was driving the CARs. Rather it was the victim count that was driving the negative CARs. The results shown in columns [1] and [2] hold in the later columns and support the idea that the tourism industry's performance is negatively affected by mass shootings with many victims.

5. Conclusion

As the occurrences of mass shootings have increased since the 1980s, with 10 shootings happening in 2019, understanding how these events can affect the economy and people's behavior is becoming more important. Travel and tourism are the United States' largest service export and

are crucial to the health of the economy, supporting millions of jobs and generating more than a trillion dollars in economic output each year.[11] Previous literature has shown that crime and serial murder have a negative effect on the tourism industry and people's behavior toward tourism.[12] In this study the hypothesis was tested that large-scale mass shootings would produce a negative shock to the stock price of the tourism firms. This hypothesis was driven by the idea of the "contagion" effect reported in the study done by Ho, Qui, and Tang (2013).

Using the data gathered from CRSP and the Motherjones mass shooting archive, results from the event studies show that tourism stocks reacted negatively to mass shooting events with a large number of victims involved. During a four-day window after the day of the event, tourism firms experienced an underperformance of 0.92% relative to the market return during the same time. This would produce an annual underperformance of nearly 40% outside of the market-wide performance. To make sure that the CARs where not being influenced by the location of the events, namely the Las Vegas outlier, multivariate tests were performed and found that the high victim count, not the Vegas shooting or location, was ultimately the cause of the significant and negative abnormal returns. The results from this study provide a new contribution to the literature showing that mass shooting events with many victims do negatively shock the performance of the tourism industry.

[11] International Trade Administration, Industry and Analysis, National Travel and Tourism office (2018)
[12] Gibson (2006)

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Appendix

Table 1 – Description of the Sample Firms
The table provided the SIC codes, the number of firms included in each category of SIC code and their description used to identify tourism firms. The descriptions and SIC codes were provided by SICCODES.com

SIC Code	No. of Firms Events	Description
4724	71	Travel Agencies
4725	43	Tour Operators
4729	10	Arrangement of Passenger Transportation, Not Elsewhere Classified
4789	57	Transportation Services, Not Elsewhere Classified
7011	2963	Hotels and Motels
7021	5	Rooming and Boarding Houses
7033	32	Recreational Vehicle Parks and Campsites
7922	161	Theatrical Producers (except Motion Pictures) and Miscellaneous Services.
7933	143	Bowling Centers
7941	95	Professional Sports Clubs and Promoters
7948	466	Racing, including Track Operation
7991	10	Physical Fitness Facilities
7992	12	Public Golf Courses
7993	395	Coin-Operated Amusement Devices
7996	286	Amusement Parks
7997	297	Membership Sports and Recreation Clubs
7999	641	Amusement and Recreation Services, Not Elsewhere Classified

Table 2 – Summary Statistics of Tourism Firms and Independent Variables

The table reports the statistics of the sample data used throughout the study. MktCap is the market capitalization or size of the included firms on the event day. Price is the CRSP closing price on the event day. Volatility is the difference between the natural log of the intraday high and the intraday low price on the day of the event. Turnover is the amount of daily volume of shares outstanding on the event day. Victims includes injured and fatalities on event day. Handguns, shotguns, revolvers, and assault weapons (aslt weapon) are binary/indicator variables equal to one if that type of firearm was used on the event day, zero otherwise. Workplace, school, church, and military are binary/indicator variables equal to one if the event took place in that venue, zero otherwise. Legal gun is a binary/indicator variable equal to one if the firearm was obtained legally, zero otherwise.

	Mean	Std. Dev.	Minimum	25th Perc.	Median	75th Perc.	Maximum
	[1]	[2]	[3]	[4]	[5]	[6]	[7]
MktCap	3,230,842,338	8,886,589,202	166,125	82,163,250	565,439,490	2,332,036,170	119,584,427,480
Price	24.59	27.72	0.06	7.38	16.65	31.69	292.98
Volatility	0.0396	-0.0615	0.0000	0.0156	0.0258	0.0441	1.3863
Turnover	0.6423	1.2324	0.0000	0.1083	0.3542	0.7991	50.9728
Victims	19.6769	52.4951	3.0000	7.0000	10.0000	18.0000	604.0000
Legal Gun	0.7049	0.4561	0.0000	0.0000	1.0000	1.0000	1.0000
Handguns	0.7578	0.4285	0.0000	1.0000	1.0000	1.0000	1.0000
Shotguns	0.2442	0.4296	0.0000	0.0000	0.0000	0.0000	1.0000
Revolvers	0.1441	0.3513	0.0000	0.0000	0.0000	0.0000	1.0000
Aslt Weapon	0.1646	0.3708	0.0000	0.0000	0.0000	0.0000	1.0000
Workplace	0.3333	0.4714	0.0000	0.0000	0.0000	1.0000	1.0000
School	0.1560	0.3629	0.0000	0.0000	0.0000	0.0000	1.0000
Church	0.0543	0.2267	0.0000	0.0000	0.0000	0.0000	1.0000
Military	0.0434	0.2037	0.0000	0.0000	0.0000	0.0000	1.0000

Table 3 – Correlation Matrix

The table shows the correlation between various variables used throughout the study. Correlation ranges from zero to one and can be either positive or negative.

	Mkt Cap	Price	Turnover	Volatility	Victims	Aslt Weap.	School	Legal Gun
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
MktCap	1.0000							
Price	0.4356	1.0000						
Turnover	0.0904	0.1160	1.0000					
Volatility	-0.1385	-0.2566	-0.0635	1.0000				
Victims	0.0897	0.1631	0.0369	-0.1361	1.0000			
Aslt Weap.	-0.0072	-0.0242	-0.1066	0.0589	0.5087	1.0000		
School	0.0338	0.0412	-0.0182	-0.1145	-0.1442	-0.2738	1.0000	
Legal Gun	-0.0956	-0.1889	-0.0156	0.0829	0.1354	0.2226	0.1363	1.0000

Table 4 – Cumulative Abnormal Returns – By Firm Type

The table shows the cumulative abnormal return based on the type of firm grouping. Lodging firms are inclusive to SIC codes 7011, 7021, and 7033. Travel firms are inclusive to SIC codes 4724, 4725, 4729, and 4789. Recreation firms are inclusive to SIC codes 7922, 7933, 7941, 7948, 7991, 7992, 7993, 7996, 7997, and 7999. Significance levels are also denoted by *, **, and ***, to represent significance at 0.10, 0.05, and 0.01, respectively.

	All Firms	Lodging Firms	Travel Firms	Recreation Firms
	[1]	[2]	[3]	[4]
CAR(-1,1)	0.0021***	0.0017*	0.0070*	0.0021*
	(2.7920)	(1.6633)	(1.8071)	(1.9268)
CAR(0,1)	0.0012**	0.0013	0.0058	0.0216***
	(2.0233)	(1.4745)	(1.5914)	(25.1784)
CAR(0,2)	0.0008	0.0007	0.0050	0.0007
	(1.2278)	(0.7537)	(1.2436)	(0.6772)
CAR(0,3)	0.0018**	0.0018*	0.0046	0.0016
	(2.3157)	(1.7504)	(0.9542)	(1.3117)
CAR(0,5)	0.0015	0.0016	0.0081	0.0009
	(1.6147)	(1.2916)	(1.4706)	(0.6348)

Table 5 – Cumulative Abnormal Returns – By Guns

The table shows cumulative abnormal returns based on the type of firearm used in the event. Legal gun is a binary variable equal to one if the firearm used in the event was obtained legally. Significance levels are also denoted by *, **, and ***, to represent significance at 0.10, 0.05, and 0.01, respectively.

	Legal Gun	Handguns	Rifle	Shotguns	Revolvers	Aslt Weapon
	[1]	[2]	[3]	[4]	[5]	[6]
CAR(-1,1)	0.0026***	0.0025**	0.0025***	0.0005	0.0039*	0.0012
	(2.8394)	(2.1925)	(2.9460)	(0.3481)	(1.8005)	(0.6466)
CAR(0,1)	0.0016**	0.0010	0.0015**	-0.0014	0.0038**	-0.0020
	(2.0928)	(1.0690)	(2.1977)	(-1.1811)	(2.1433)	(-1.3076)
CAR(0,2)	0.0011	0.0011	0.0017**	-0.0012	0.0027	-0.0031*
	(1.3327)	(1.0669)	(2.1796)	(-0.7996)	(1.2816)	(-1.7318)
CAR(0,3)	0.0022**	0.0029**	0.0024***	0.0019	0.0054**	-0.0018
	(2.2244)	(2.3891)	(2.7207)	(1.1299)	(2.2397)	(-0.9005)
CAR(0,5)	0.0013	0.0029**	0.0016	0.0032	0.0068*	-0.0034
	(1.1320)	(2.0758)	(1.5006)	(1.5534)	(2.2582)	(-1.4693)

Table 6 – Cumulative Abnormal Returns – By Location

The table shows CARs by event location. Four locations were given in the dataset from MotherJones.com: workplace, school, religion (church), and military. Significance levels are also denoted by *, **, and ***, to represent significance at 0.10, 0.05, and 0.01, respectively.

	Workplace	School	Religion	Military
	[1]	[2]	[3]	[4]
CAR(-1,1)	0.0018	0.0040**	0.0022	-0.0050
	(1.5062)	(2.3334)	(0.8391)	(-1.4483)
CAR(0,1)	0.0015	0.0015	0.0008	-0.0080***
	(1.5438)	(1.0581)	(0.3746)	(-3.2007)
CAR(0,2)	0.0007	0.0007	0.0021	-0.0140***
	(0.5874)	(0.3803)	(0.8280)	(-5.2310)
CAR(0,3)	0.0016	0.0024	0.0028	-0.0145***
	(1.2155)	(1.1522)	(0.9284)	(-4.4311)
CAR(0,5)	0.0004	0.0034	-0.0028	-0.0174***
	(0.2685)	(1.4132)	(-0.8023)	(-4.5962)

Table 7 – Cumulative Abnormal Returns – By Victim Count

The table shows the cumulative abnormal return based on the classification of victim level: high, middle, low. The high victim category includes any event with more than 34 involved victims. The middle victim category includes any event with more than six and fewer than 35 involved victims. The low victim category includes any event with less than six involved victims. Significance levels are also denoted by *, **, and ***, to represent significance at 0.10, 0.05, and 0.01, respectively.

	All Firms	Low Victim	Middle Victim	High Victim
	[1]	[2]	[3]	[4]
CAR(-1,1)	0.0021***	0.0003	0.0031***	-0.0023
	(2.7920)	(0.2798)	(3.4298)	(-0.8480)
CAR(0,1)	0.0012**	0.0006	0.0022**	-0.0045*
	(2.0233)	(0.6289)	(3.0679)	(-1.8282)
CAR(0,2)	0.0008	0.0008	0.0018**	-0.0061**
	(1.2278)	(0.6496)	(2.2675)	(-2.5148)
CAR(0,3)	0.0018**	0.0021	0.0032***	-0.0083***
	(2.3157)	(1.4454)	(3.3796)	(-3.2495)
CAR(0,5)	0.0015	0.0023	0.0028**	-0.0092***
	(1.6147)	(1.3449)	(2.5521)	(-2.8707)

Table 8 – Cumulative Abnormal Returns – By Victim, Vegas Separated

This table shows the CARs by victim count when separating the Las Vegas Mandalay Bay shooting. Significance levels are also denoted by *, **, and ***, to represent significance at 0.10, 0.05, and 0.01, respectively.

	Vegas Shooting	High Victim (w/o Vegas)	Non-High Victim (w/o Vegas)
	[1]	[2]	[3]
CAR(-1,1)	-0.0113***	-0.0016	0.0026***
	(-3.6841)	(-0.5522)	(3.3602)
CAR(0,1)	-0.0100***	-0.0040	0.0019***
	(-3.5349)	(-1.5446)	(3.1078)
CAR(0,2)	-0.0101**	-0.0058**	0.0016**
	(-2.3818)	(-2.2418)	(2.3561)
CAR(0,3)	-0.0082**	-0.0083***	0.0030***
	(-2.0228)	(-3.0404)	(3.6688)
CAR(0,5)	-0.0037	-0.0097***	0.0028***
	(-0.7067)	(-2.8078)	(2.8578)

Table 9 – Multivariate Tests - Cumulative Abnormal Returns

The table reports the results from the following regression:

$$CAR(0,3) = \alpha + \beta_1 Victims + \beta_2 Assault\ Weapon + \beta_3 Legal\ Weapon + \beta_4 Travel + \beta_5 Lodging + \beta_6 Workplace + \beta_7 School + \beta_8 Church + \beta_9 Ln(MktCap) + \beta_{10} Ln(Price) + \beta_{11} Volatility + \beta_{12} Turnover + \varepsilon_i$$

The dependent variable is the four-day CAR window beginning on the day of the event to three days after the event. The independent variables are as follows: victims as the total number of victims involved in the mass shooting events. Assault weapon is a binary variable equal to one if an assault style weapon was used in the event, zero otherwise, it was included due to the sensitivity to the news and media. Legal weapon is a binary variable equal to one if the weapon used in the event was obtained legally, zero otherwise. Travel is a binary variable equal to one if a firm falls under the SIC code of 4724, 4725, or 4729, zero otherwise. Lodging is a binary variable equal to one if a firm falls under the SIC code of 7011, 7033, or 7041 zero otherwise. Workplace is a binary variable equal to one if the event took place in that location, zero otherwise. School is a binary variable equal to one if the event took place in that location, zero otherwise. Church is a binary variable equal to one if the event took place in that location, zero otherwise. Ln(MktCap) is the natural log of the market capitalization (size) of the firms in the tourism industry. Ln(price) is the natural log of the CRSP closing prices of the firms on the event dates. Volatility is difference between the natural log of the intraday high and intraday low price on the day of the event. Turnover is the amount of daily volumes of shares outstanding on the event day. White robust standard errors are show in parenthesis. Significance levels are also denoted by *, **, and ***, to represent significance at 0.10, 0.05, and 0.01, respectively.

	CAR(0,3)					
	[1]	[2]	[3]	[4]	[5]	[6]
Victims	-0.00003***					-0.00004***
	(0.00001)					(0.00001)
AstWeapon		-0.005**				-0.004
		(0.002)				(0.003)
Legal Gun			0.0005			0.002
			(0.002)			(0.002)
Travel				0.003		0.003
				(0.005)		(0.005)
Lodging				-0.0005		-0.0005
				(0.002)		(0.002)
Workplace					-0.004*	-0.005**
					(0.002)	(0.002)
School					0.002	0.002
					(0.003)	(0.003)
Church					0.002	0.0003
					(0.004)	(0.004)
Ln(MktCap)	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001	-0.0001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Price)	0.001	0.001	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Volatility	0.074***	0.074***	0.074***	0.074***	0.073***	0.074***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Turnover	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-0.049***	-0.049***	-0.050***	-0.050***	-0.049***	-0.051***
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Adj. R2	0.029	0.029	0.028	0.028	0.029	0.029
Year FEs	Yes	Yes	Yes	Yes	Yes	Yes
Robust SEs	Yes	Yes	Yes	Yes	Yes	Yes
N	5550	5550	5550	5550	5550	5550

Table 10 – Multivariate Tests - Cumulative Abnormal Returns

The table reports the regression results for the follow equation:

$$CAR(0,3) = \alpha + \beta_1 Vegas + \beta_2 Victims + \beta_3 Assault\ Weapon + \beta_4 Legal\ Weapon + \beta_5 Travel + \beta_6 Lodging + \beta_7 Workplace + \beta_8 School + \beta_9 Church + \beta_{10} Ln(MktCap) + \beta_{11} Ln(Price) + \beta_{12} Volatility + \beta_{13} Turnover + \varepsilon_i$$

The dependent variable is the four-day CAR window beginning on the day of the event to three days after the event. The independent variables are as follows: Vegas which is a binary variable equal to one if the event took place in Las Vegas, zero otherwise. victims as the total number of victims involved in the mass shooting events. Assault weapon is a binary variable equal to one if an assault style weapon was used in the event, zero otherwise, it was included due to the sensitivity to the news and media. Legal weapon is a binary variable equal to one if the weapon used in the event was obtained legally, zero otherwise. Travel is a binary variable equal to one if a firm falls under the SIC code of 4724, 4725, or 4729, zero otherwise. Lodging is a binary variable equal to one if a firm falls under the SIC code of 7011, 7033, or 7041 zero otherwise. Workplace is a binary variable equal to one if the event took place in that location, zero otherwise. School is a binary variable equal to one if the event took place in that location, zero otherwise. Church is a binary variable equal to one if the event took place in that location, zero otherwise. Ln(MktCap) is the natural log of the market capitalization (size) of the firms in the tourism industry. Ln(price) is the natural log of the CRSP closing prices of the firms on the event dates. Volatility is difference between the natural log of the intraday high and intraday low price on the day of the event. Turnover is the amount of daily volumes of shares outstanding on the event day. White robust standard errors are show in parenthesis. Significance levels are also denoted by *, **, and ***, to represent significance at 0.10, 0.05, and 0.01, respectively.

	CAR(0,3)			
	[1]	[2]	[3]	[4]
Vegas	-0.013***	0.089***	-0.012**	0.118***
	(0.005)	(0.032)	(0.006)	(0.035)
Victims		-0.0002***		-0.0002***
		(0.0001)		(0.0001)
AstWeapon			-0.005*	-0.002
			(0.003)	(0.003)
Legal Gun			0.001	0.002
			(0.002)	(0.002)
Travel			0.003	0.003
			(0.005)	(0.005)
Lodging			-0.0004	-0.0005
			(0.002)	(0.002)
Workplace			-0.005**	-0.006***
			(0.002)	(0.002)
School			0.002	0.004
			(0.003)	(0.003)
Church			0.0004	0.002
			(0.004)	(0.004)
Ln(MktCap)	-0.0001	-0.0001	-0.0001	-0.0001
	(0.001)	(0.001)	(0.001)	(0.001)
Ln(Price)	0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)
Volatility	0.074***	0.074***	0.074***	0.074***
	(0.027)	(0.027)	(0.027)	(0.027)
Turnover	0.006***	0.006***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	-0.049***	-0.048***	-0.051***	-0.049***
	(0.016)	(0.016)	(0.016)	(0.016)
Adj. R2	0.028	0.030	0.029	0.031
Year FEs	Yes	Yes	Yes	Yes
Robust SEs	Yes	Yes	Yes	Yes
N	5,550	5,550	5,550	5,550