Bachelor Thesis

Terrorism and Financial Markets:
A North American and European Study

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Abstract

This paper investigates the impact of terrorism on financial markets in North America and Europe. This is done by investigating 22 attacks in 10 different countries from 2001 on. Stock indices are used as a proxy for financial markets. These indices consist of the major stock index of the country where an attack happened, the MSCI World and the MSCI Europe. An event study is performed by calculating both event day abnormal returns and cumulative abnormal returns. Robustness of the results is accounted for by using two different estimation windows and by using both normal and total returns. Results for event day abnormal returns show that attacks in the 2000s had highly significant negative impacts on stock indices, while these effects diminish for attacks in the 2010s. Furthermore, attacks of radical Islamic ideology and attacks on North American soil have the largest impacts on stock indices. Results for cumulative abnormal returns are inconsistent and fail robustness checks, and are thus inconclusive. Longer lasting impacts are thus not found. Conclusions are in accordance with existing literature in the sense that terrorist attacks indeed seem to have significantly negative short term impacts on financial markets. Nevertheless, most literature also found longer lasting impacts. While financial markets can be impacted by terrorist attacks in the short term, they seem to recover very quickly and are thus relatively efficient in absorbing the effects of such attacks.

Outline

1. Introduction

The number of terrorist attacks has largely increased over the past few years, especially in North America and Europe. According to the importance that these unfortunate events have on the aforementioned societies and the world in general, it would be interesting to research if these events impact financial markets in a statistically significant way. On the one hand, it can be important for investors to know how their investment will evolve after an attack, in order to have planning security. On the other, knowing how terrorism affects financial markets is important to regulators, policy makers and financial institutions in order to know how to react to such attacks, in order to maintain efficient and well-functioning financial markets. Rational economic theory would not expect a significant impact since terrorist attacks do usually not have an impact on underlying assets of companies, and should thus not affect stock returns. Nevertheless, since stock markets and indices are not only priced by institutional investors, expected to be rational, but also by individual investors, which can be expected to be emotionally affected by these attacks, financial markets could be affected. As mentioned by Fisher and Statman (2000), investor sentiment can have a statistically significant effect on stock markets returns. Furthermore, terrorist attacks can lead to political and economic uncertainty, which can affect financial markets in a significant way. Stock index returns will be used as a proxy for financial markets. Therefore the following question arises:

Do terrorist attacks impact stock index returns?

In order to investigate if terrorist attacks have a significant impact on financial markets, an event study methodology is used. In order to perform this study, I will investigate, if returns on the day of/after an attack are significantly different than before, and if significant cumulative abnormal returns can be observed after the event date. If significant results are found, I believe that the effect can be attributed to those attacks, since they are completely exogenous and unpredictable. Nevertheless, robustness tests will be performed in order to see if the results are valid and not due to randomness or other disregarded economic phenomena. This is done by varying estimation windows and using both normal and total returns. Stock indices of the respective country where an attack happened, in addition to regional and world indices, will be used in order to research the global and regional financial impacts of terrorism. Furthermore, a distinction will be made between the different motives for terrorism, for instance, Islamic terrorism and right wing inspired terrorism, to see if markets react differently to different forms of terrorism. Since terroristic incidents have multiplied over the past years and are expected to happen again, I believe that this research is academically and socially relevant. Understanding these consequences can enable investors, policy makers, regulators and financial institutions to react more efficiently in order to guarantee the well-functioning of financial markets, despite these horrific events. Furthermore, this paper adds to existing literature by confronting terrorist attacks of both radical Islamic and right wing nature. To the extent of my knowledge, this has not been researched yet. Furthermore, while most research on terrorist attack also uses an event study methodology, robustness is

typically not approached to the same extent. This paper will first review existing literature, then explain the used data and methodology, before presenting the results and the conclusions.

2. Literature review

The effect of terrorist attacks on financial markets has been studied by a wide range of academics, especially in the aftermath of the 9/11 attacks in New York City in 2001. Nevertheless, most renowned literature on this topic is limited to this aftermath and thus, does not incorporate the effects of the multiple attacks that happened in Europe and North America in recent years. Furthermore, most research focuses on Islamic/jihadist terrorism, and this paper also wants to provide new insights by confronting the effects of Islamic and right wing terrorism. Most literature use event study methodologies in order to investigate the aforementioned effects. Nevertheless, the effect of terrorism on financial markets has been studied through various methods. In general, the data of most literature consists of the main stock index of the country where an attack happened, as well as international and regional stock indices.

Chen and Siems (2004) researched various terrorist and military attacks on US soil from 1915 to 2001. They investigated how American and global financial markets reacted to those attacks through an event study methodology. The Dow Jones Industrial Average is used as a proxy for US capital markets. Even date abnormal returns and cumulative abnormal returns for 6 and 11 days were used. In general, they found these attacks to have a significant negative impact on American and global financial markets as well as spillover effects on other markets, because of the strong interaction between foreign financial markets. Nevertheless, looking at attacks over nearly a century, Chen and Siems came to the conclusion that these impacts strongly diminished over time, suggesting that financial markets became more and more efficient in absorbing the effects of terrorism. This phenomenon is explained by the fact that the banking and financial sector are efficient in providing liquidity in order stabilize markets and reduce panic among investors.

The same phenomenon can be observed in Israel when looking at Palestinian attacks between 1990 and 2003 (Eldor & Melnick, 2004). Especially, it was found that financial markets are impacted by attacks but that they still function efficiently shortly after, suggesting that markets are robust to such attacks. They investigated 639 attacks on Israeli soil and looked at the Tel Aviv Stock Exchange as a reference for financial markets. Interesting findings are that suicide attacks and the number of casualties affect the stock market significantly, but location, meaning if it happened in a major metropole or not, does not impact stock returns. Furthermore, they found terrorist attacks to have no effect on foreign exchange markets. In contrast to common event study methodology, Eldor and Melnick use a regression approach to investigate the aforementioned effects.

Hon, Strauss and Yong (2004) investigated contagion effects of the 9/11 terrorist attacks. Looking at various stock markets around the world using a variety of regression analysis. They found out that the aforementioned terrorist attack had more or less the same impact on multiple financial

markets across the globe than it had on the US. Volatility spillovers and contagion effects could explain those findings. An interesting finding is that European markets did not to exhibit these effects before this crisis but seemed to do so after it. The main implication of this study is that because of this contagion, it is difficult to create a portfolio which would diversify away the risk of terrorist attacks.

A reference paper on terrorism's effect on stock returns is a 2006 paper by Johnson and Nedelscu. They also found markets to function efficiently in responding to terrorism. They investigated the effect of 9/11 and the Madrid bombings of 2004 on their respective regional major stock index. This paper does also make use of the classical event study methodology. 9/11 proved to have a significantly negative impact on returns when using the S&P 500 but the Madrid bombings did not have any significant impact on the Dow Jones Euro Stoxx. Nevertheless, the latest finding might be due to poor choice of reference index, since only 5 Spanish companies are constituent of the aforementioned index. Investigating the effect on a purely Spanish index might result in different findings. Even though significant effects were found for the first mentioned attack, Johnson and Nedelscu support the findings of the first two mentioned papers in the sense that financial markets react efficiently to terrorist attacks.

Karolyi and Martell's research paper (2006) analyzed the effect 77 attacks between 1995 and 2002 on various stock markets, through an event study. Also attacks which did not result in casualties were investigated. In general, the findings show significantly negative returns around the event day, especially for attacks which resulted in fatalities. Furthermore, the more democratic a country is, the less is the impact of an attack on its respective stock exchange.

Arin, Ciferri and Spagnolo (2008) research the effect of terrorism in six countries, the United Kingdom, Turkey, Spain, Indonesia, Israel and Thailand, using a VAR-GARCH approach in a time series analysis. They found statistically significant causal effects of terror attacks on the respective countries' stock markets. Nevertheless, Spain and the United Kingdom are affected in a lesser degree. It is argued that those western countries have more efficient and well-functioning financial institutions.

Kollias, Papadamou and Stagiannis (2010) only research the impact of the 2004 Madrid and the 2005 London terror attacks on their respective major stock exchanges. An event study methodology and time varying volatility were used in order to assess the aforementioned effects. Similar results were found for both attacks when looking at magnitude. Both events had significantly negative effects on their respective stock markets. Nevertheless, the London stock exchange recovered faster than the Spanish one, when looking at 6 and 11 days cumulative abnormal returns. The authors give two possible explanations for the observed. Firstly, because of London stock exchange's greater size and liquidity. The other explanation is that contrary to the London attacks, which were suicide attacks, the Madrid terrorists were only neutralized a couple of days after the attacks and thus spreading uncertainty, which could explain the longer lasting impact.

Graham and Ramiah (2011) studied the impact of terror of five terrorist attacks in the US, the UK, India, Spain and Indonesia on industry specific markets in Japan. Again, an event study methodology was used to study the aforementioned effects. They found out that only 9/11 had a major impact on Japanese markets, both when looking at event day abnormal returns and five-day cumulative abnormal returns. Spillover and contagion effects are thus relatively unimportant when analyzing impacts of terrorism. 9/11 can here be seen as an exception, as compared to other attacks, 9/11 is known to have had a global economic effect.

Chesney, Karaman and Reshetar (2011) analyzed the effect of 77 attacks in 25 countries using multiple indices around the world, and found out that 2/3 of the attack had a significant effect on at least one stock market, not necessarily the market of the country that suffered the attack, as spillover effects seem to be very pronounced when terrorist attacks happen. They investigated these effects through three different methodologies: the classical event study methodology, a non-parametric approach and a GARCH-EVT methodology. They found the non-parametric approach to be the most fruitful, especially because of its robustness against multiple factors as interest rates, contemporaneous effect, spillover effects and equity market integration. Furthermore, effects of terrorism on particular industries were researched. Chesney, Karaman and Reshetar came to the conclusion that the most exposed industries are insurance, airlines and travel stocks markets. Using their results, came up with investment strategies in order to hedge the risk of terrorist attacks and diversify it away. Finally, an interesting finding is that there seem to be similarities between the effects of terror and natural catastrophes, or other extreme events, on financial markets.

Kumar and Liu (2013), in opposition to the aforementioned papers, investigated the effect of terrorist attacks, not only on the country of interest, where an attack occurred, but also on its trading partners. To increase the significance of their results, they analyzed the aforementioned effects through an event study methodology as well as through a logit regression. Significant spillover effects were only found for trading partners of a country where an attack has occurred. Furthermore, the smaller the trading partner in terms of relative size (GDP), the more pronounced the spillover effects. Finally, democratic countries are the most affected by these spillover effects.

Finally, a recent working paper by Bonekamp and Van Veen (2017) investigates the effect of attacks ranging from 9/11 until the 2016 Berlin truck through graphical analyses as well as through an event study methodology. Significant negative results were only found for the 9/11 attack, the Madrid attack in 2003 and the Boston bombings in 2013. Thus, Bonekamp and Van Veen only found relatively weak effects that are diminishing over time, indicating that financial markets are relatively robust to such attacks and work in an efficient way. Nevertheless, they do not exclude the possibility that markets of specific industries could be strongly affected by terrorism and thus, indirectly affect financial markets.

3. Data
a) Terrorist Attacks

First of all, it is important to define what a terrorist attack is. In this paper, the definition of the European Parliament is used. It describes terrorism as an act of "seriously intimidating a population, unduly compelling a government or international organization to perform or abstain from performing any act, or seriously destabilizing or destroying the fundamental political, constitutional, economic or social structures of a country or an international organization" (Pawlak, 2015). This paper will only investigate terrorist attacks which resulted in civilian casualties other than the attackers themselves, as it is reasonably assumable that only attacks followed by casualties can have a societal impact that can significantly affect financial markets. Only attacks in North America and Europe will be investigated. This paper will differentiate between Islamic and right wing terrorism through the study of events following the attacks of the 11th of November 2001 (9/11) in the United States of America. Finally, specifics about each attack as the number of casualties, the location, if an attack has been claimed by a terrorist organization or not and the ideology behind the attack, will also be collected. Reliable newspaper articles and/or the Global Terrorism Database (GTD), references as START (National Consortium for the Study of Terrorism and Responses to Terrorism) will be used to collect data on attacks. The GTD only covers terrorist attacks up until the end of 2016.

i)   Islamic Terrorism

In recent years, most terrorist attacks on European and North American soil have been performed in the name of radical Islamic ideology. In fact, 18 out of the 22 terrorist attacks that are investigated in this paper are of radical Islamic ideology. While the most recent attacks have been for the most part claimed by the Islamic State of Iraq and the Levant (ISIL), most attacks before its emergence can be attributed to the terrorist organization Al-Qaeda. Data on terrorist attacks up until and including 2016 is collected through the Global Terrorism Database by the University of Maryland. Data on more recent attacks is collected through other resources. A brief description of every investigated attack is chronologically given hereunder:

- **9/11 Attacks: 11.09.2001 in New York City, Arlington and Shanksville, United States**

On September 11th, a total of 19 terrorists hijacked a total of 4 commercial planes. Two of the planes were redirected and crashed into the World Trade Center's twin towers, symbolic for the American military, economic and political power. Furthermore, two planes were redirected in order to crash into the Pentagon. Nevertheless, only one plane reached its destination and the other one crashed on the ground near Shanksville, Pennsylvania. The attacks resulted in 2,998 casualties in addition to the terrorists, more than 7000 injuries and more than 4 billion dollars in material damage. These attacks are considered the deadliest attacks in the Western World. They have been claimed by Al-Qaeda, a terrorist Organization around Osama Bin-Laden. (START, 2016). Furthermore, it is important to notice that these attacks resulted in a four days closure of the New York Stock Exchange (NYSE) (Redden, 2017).

- **Madrid Train Bombings: 11.03.2004 in Madrid, Spain**

On March 11th, a series of 10 bombs in 4 different trains around Madrid resulted in 191 casualties, more than 1800 injuries and about 6.6 million dollars in damage. This attack was first suspected to have been performed by the Euskadi Ta Askatasuna (ETA), a Basque nationalist organization but was later claimed by the Abu Hafs al-Masri Brigades, a radical Islamic terrorist group affiliated to Al-Qaeda (START, 2016).

- **London Bombings: 07.07.2005 in London, United Kingdom**

On July 7th, 2005, as series of three suicide bomb attacks hit three different subways in London's public transportation. Another suicide bomb was denoted on a bus in the city center. These attacks resulted in 56 casualties, including four terrorists, and more than 700 injuries. The attack was claimed by the Secret Organization of Al-Qaeda in Europe (START, 2016).

- **Toulouse and Montauban Attacks: 15.03-19.03.2012 in Toulouse and Montauban, France**

On March 15th, three French Soldiers were shot in Montauban. Four days later, four children were shot in front of their Jewish school in Toulouse. This series of attacks was performed by Mohammed Merah, claiming he did it to revenge the killing of Palestinian children (START, 2016).

- **Boston Bombings: 15.04.2013 in Boston, United States**

During the yearly Boston Marathon, two bombs exploded in the spectator area killing 3 people and injuring more than a two hundred men. The attacks were performed by the Tsarnaev brothers, two Muslim extremists. One brother was killed during a shootout with the police and the other one was captured and sentenced to death (START, 2016).

- **Jewish Museum Attack: 24.05.2014 in Brussels, Belgium**

On May 24[th,] four people were fatally shot in front of the Jewish Museum of Belgium. This attack was performed by Mehdi Nenmouche, a French terrorist who is suspected to have fought alongside ISIL (START, 2016).

- **Charlie Hebdo Attack: 07.01.2015 in Paris, France**

In the morning of January 7th, two people entered by force the offices of the satirical newspaper Charlie Hebdo in Paris. Eleven people were killed and another eleven injured. The victims include both journalists and security officers. The perpetrators were identified as Cherif and Said Kouachi, two brothers that swore allegiance to Al-Qaeda in the Arabian Peninsula (AQAP). AQAP claimed responsibility and explained that the attack was an answer to a satirical depiction of Muhamad. (START, 2016).

- **Copenhagen Attacks: 14.02-15.02.2015 in Copenhagen, Denmark.**

On February 14th, at free speech debate about the aforementioned Charlie Hebdo attack, one man fired shots killing one man. Later that night, the same man killed at security guard in front of a synagogue killing a security guard. Omar El-Hussein, a Muslim extremist was identified as the shooter (START, 2016).

- **Paris Attacks: 13.11.-14.11.2015 in Paris and Saint-Denis, France**

The Paris attacks consisted of multiple coordinated attacks across the cities of Paris and Saint-Denis. The attacks included suicide bombings at the Stade de France, the national stadium, suicide bombings and shootouts at the concert hall Bataclan and a series of shootings in nearby cafes and restaurants. In total, these attacks resulted in 136 casualties, including the 7 perpetrators and over 350 injuries. The attacks were claimed by ISIL as retaliation for the French involvement in the war against ISIL (START, 2016)

- **San Bernardino Attack: 02.12.2015 in San Bernardino, United States**

On this day, two individuals stormed the Inland Regional Center in San Bernardino, California. This attack resulted in 14 casualties and 17 injuries. Syed Rizwan Farook and Tashfeen Malik, the two assailants, were killed by the police on the same day. They pledge allegiance to ISIL, which claimed the attack. Nevertheless, intelligence agencies did not find any link between them and ISIL (START, 2016).

- **Brussels Bombings: 22.03.2016 in Brussels and Zaventem, Belgium**

A total of three bombs detonated across Brussels. Two suicide bombings were carried out, at the Brussels Airport in Zaventem and the other one at the Maalbeek metro station in Brussels. This series of attacks killed 35 people including the 3 attackers. Furthermore, more than 270 people were injured. ISIL claimed the attack and argued that it was carried because of the Belgian paerticipation in the war against ISIL (START, 2016).

- **Orlando Nightclub Attack: 12.06.2016 in Orlando, Unites States**

During a party in a gay nightclub called "Pulse", one man opened fire and took hostages, killing 49 people. The perpetrator was later neutralized by the police. The terrorist was identified as Omar Mateen, who swore allegiance to ISIL. ISIL claimed the attack as retaliation for US bombings against ISIL. Nevertheless, intelligence agencies could not confirm a link between ISIL and Mateen (START, 2016).

- **Nice Truck Attack: 14.07.2016 in Nice, France**

On the French national holiday, a man drove a truck into a crowd killing 86 people and injuring 433. He was later neutralized by the police. The attack was claimed by ISIL. Again, intelligence forces could not confirm direct contact between both parties (START, 2016).

- **Berlin Truck Attack: 19.12.2016 in Berlin, Germany**

On December 19th, a truck was driven into a crowd at a Christmas market in Berlin. This attack resulted into 12 casualties and 48 injuries. Furthermore, the assailant killed the driver of the truck that he hijacked. He was able to flee but was neutralized by the police days later in Milan. ISIL claimed the attack and Amri, the killer, swore allegiance to them (START, 2016).

- **Westminster Bridge Attack: 22.03.2017 in London, United Kingdom**

A car was driven on the pavement of the Westminster Bridge killing four people and injuring more than 50. Later, the attacker left the car and stabbed a police officer before getting shot. ISIL claimed responsibility for the attack (Siddique (The Guardian), 2017).

- **Stockholm Truck Attack: 07.04.2017 in Stockholm, Sweden**

A man hijacked a car and drove it through the streets of Stockholm, killing 5 people and injuring more than 15 (Anderson & Sorensen (The New York Times), 2017).

- **Manchester Arena Attack: 22.05.2017 in Manchester, United Kingdom**

At the end of a concert of American singer Ariana Grande, a man detonated a suicide bomb killing 22 people and injuring more than 200. ISIL claimed responsibility for the attack (BBC, 2017).

- **London Bridge Attack: 03.05.2017 in London, United Kingdom**

Three men drove a car through a crowd on the London Bridge before crashing the car. They then proceeded by stabbing people before getting neutralized by the police. The attack resulted in 8 casualties. Again ISIL claimed the attack (BBC, 2017).

ii) Right Wing Terrorism

As mentioned before, in recent years, most attacks on Western soil have been performed in the name of Islamic terrorist organizations or ideology. Nevertheless, right-wing and racism motivated terror attacks also happened in the aforementioned Western countries. Data on those attack has also been retrieved from the Global Terrorism Database and newspapers. Brief descriptions are chronologically given below:

- **Anders Breivik Attack: 22.07.2011 in Oslo and Utoya, Norway**

On July 22th, Anders Breivik planted a bomb in a van in front of the office building of the Prime Minister. The bomb killed 8 people and injured another 15. After fleeing the scene, Breivik went to the Utoya Island where a youth camp of the Norwegian Labor Party took place. He intruded the island by faking his identity as a police man and opened fire, killing 69 people and injuring 60. He

was then arrested when police came and sentenced to an extendable 21 years in prison. He was a right wing extremist (START, 2016).

- **Wisconsin Sikh Temple Attack: 05.08.2012 in Oak Creek, United States**

Michael Page, a white extremist, entered a Sick temple in Oak Creek, Wisconsin and started shooting. He killed 6 people and injured 4 before killing himself. The assailant was motivated by white supremacist ideology. No organization claimed the attack (START, 2016).

- **Charleston Church Attack: 17.06.2015 in Charleston, United States**

On June 17th, a young man entered a black church and started shooting, killing 9 people. The perpetrator was identified as Dylan Roof.. He was motivated by white extremist ideology (START, 2016).

- **Islamic Cultural Center Attack: 29.01.2017 in Quebec City, Canada**

Two man entered an Islamic Culture Center in Quebec City and opened fire, killing 6 and injuring 8. Police investigated the attack as a terrorist attack (McKirdy & Newton (CNN), 2017).

b) Financial Data

In order to investigate the effect of terrorist attacks on financial markets, this paper will first research the effect of each attack on its domestic major financial market, through the most important stock index per country. Thus, the S&P 500 (USA), the DAX 30 (Germany), the CAC 40 (France), the FTSE 100 (UK), the BEL 20 (Belgium), the S&P/TSX Composite Index (Canada), the OMX Copenhagen 20 (Denmark), the OMX Stockholm 30 (Sweden), the OBX index (Norway) and the IBEX 35 (Spain) are used as reference indices for each country. Moreover regional effects will only be investigated for Europe, using the MSCI Europe. Finally, the global effect of terror on financial markets will be investigated through the MSCI World. Daily normal stock returns will be used. Furthermore, in order to check if significant results are not due to the reinvestment of capital gains, this paper will also investigate the effect of terrorist attacks on total return indices. Nevertheless, this paper will primarily use normal returns to assess the impact of terrorism on stock markets. Total return indices have different returns than price indices because capital gains such as dividends, interest returns, etc. are reinvested into every stock and thus into the according index. To account for the difference in total and normal returns, the total return index of the same index as mentioned above are used for every country. It is important to notice that for Germany, the DAX 30 is used, which is by definition a total return index. Therefore, the effect of the 2016 Berlin Truck Attack on a normal price index will not be accounted for. Furthermore, the domestic effects of attacks in Norway and Denmark will only be investigated for their respective normal return index (OMX Copenhagen 20 and OBX). All financial data is retrieved from Bloomberg.

4. Methodology

In order to assess the effect of an event on stock or index returns, multiple methodologies can be used. The event study methodology is the most commonly used in the previously mentioned case. Therefore, this paper will also make use of this methodology. The event study methodology consists of comparing returns before and after the investigated event, in order to assess if those returns are significantly different from each other and thus, draw conclusions of the effect of this event. This paper will use two specific event study tools. First, event day abnormal returns will be looked into and secondly, cumulative abnormal returns will be computed. In both cases, an estimation window and an event window have to be determined. Typically, estimation windows consist of a period of 20 or 45 days. This paper will estimate abnormal returns in both cases, thus for 20 and 45 days. This is done in order to check if potential results are indeed due to an attack and not to the length of an estimation period. If an attack proves to be significant with both estimation window, the effect can well be attributed to the attack. Nevertheless, this paper will look primary look at results for a 45-day estimation period, and look at the results of the of the 20-day estimation window in order to make sure that findings are not biased in regard to length of the estimation window. Therefore, when the estimation window is not specifically mentioned, the 45-day estimation window is used. The same counts for normal and total return indices. If not mentioned otherwise, this paper will always talk about normal return indices. 20-days estimation windows and total return indices are thus used as a way to ensure the robustness of the findings.

Furthermore, an event window has to be created. Typically, event windows are set 10 days before and 10 days after an event, to account for information leakage. Nevertheless, terrorist attacks are presumed to be unpredictable, and thus information leakage can be neglected. Otherwise, intelligence agencies would have stopped the attack. Therefore, the estimation window will end on the day prior to an event, instead of 10 days before. From this also follows that our event window will only consist of the 10 days following an attack. In case an attack takes place less than five hours before market closure or after the market closure, the following day is used as the first day of the event window, otherwise the same day is used. More details on specifics about each tool will be described hereunder. The used methodology is similar to the one used by Bonekamp and Van Veen (2017).

a) Event Day Abnormal Returns

In order to investigate if terrorist attacks have an immediate effect on stock indices, event day abnormal returns have to be computed. Event day abnormal returns consist in the difference between the return on the day of/after the event, and the average returns during the estimation period (here 20 and 45 days). Therefore, average returns have to be calculated for both estimation windows of 20 and 45 days (respectively $\overline{R_{i,20}}$ and $\overline{R_{i,45}}$, i being the indicator of which index is used). Afterwards, once the returns on the first day after an attack (R_i) have been identified, event day abnormal returns have to be calculated for 20 and 45 days (respectively $AR_{i,20}$ and $AR_{i,45}$) in the following way:

$$AR_{i,T} = R_i - \text{ and } \overline{R_{i,T}} \text{ (T takes values 20 or 45)}$$

For a terrorist attack to have a significant effect on stock indices, event day returns have to be significantly different from the average returns for 20 and 45 days. This is equivalent to test if event day abnormal returns are significantly different from 0. From this follows this paper's first null hypothesis: *Event day abnormal returns are equal to 0,* which is equivalent to stating that terrorist attacks have no immediate impact on financial markets. Even though stock returns are not normally distributed, stock indices can be assumed to follow a normal distribution (Brown & Warner, 1985). This assumption enables to test for significance by calculating a t-statistic using abnormal returns and the standard deviation of returns in the estimation period ($S(R_{i,t})$) in the following way:

$$t_{i,T} = (AR_{i,T}) / (S(R_{i,t}))$$

Abnormal returns will be tested at 1%, 5% and 10% significance level, corresponding to critical t-values of respectively 2.576, 1.960 and 1.645. Event day abnormal returns will be tested for each terrorist attack on its domestic price and total return index, as well as on regional and global indices.

b) Cumulative Abnormal Returns

In order to assess if terrorist attacks, not only have immediate effects on financial markets, but also longer lasting impacts, abnormal returns will also be tested for longer periods of time. In fact, this paper will investigate the effect on a 5 and 10 days period. The most appropriate way to test the aforementioned effect, is by calculating 5 and 10 days cumulative abnormal returns (respectively $CAR_{i,5}$ and $CAR_{i,10}$). Both CAR start on the first day after an attack. Cumulative abnormal returns are the sum of the abnormal returns during the investigated period and are computed in the following way:

$$CAR_{i,T} = \sum_{t=1}^{t=T} (AR_{i,t}) \text{ (T takes value 5 or 10)}$$

For terrorist attacks to have lasting effect on financial markets, cumulative abnormal returns have to be significantly different from the estimation period. This is equivalent to this paper's second null hypothesis: *Cumulative abnormal returns are equal to 0.* As for the event day abnormal returns, this means that terrorist attacks do not have an impact on financial markets. Moreover, since stock indices are again assumed to be normally distributed, significance can be tested through a t-statistic using cumulative abnormal returns and the standard deviations calculated in the following way (Van der Sar, 2015):

$$S(CAR_{i,T}) = \sqrt{((T_2 - T_1 + 1)\sigma^2(AR_{i,t}))}$$

Using these standard deviations, t-values can be computed in the following way:

$$t_{i,T} = (CAR_{i,T}) / (S(CAR_{i,T})$$

The same significance level and their according critical t-values as for the first day abnormal returns are used. Furthermore, each attack will again be tested on their domestic, regional and global indices, both for normal and total return indices.

5. Results
a) Event Day Abnormal Returns

As previously seen in the literature review, most research found terrorist attacks to have negative impacts on stock markets. At first glance, this seems to hold in this paper's context as well. In fact, most of the event day abnormal returns prove to be negative. Looking at domestic stock indices with an estimation period of 45 days (Table 1), 13 out of 21 investigated attacks have negative event day returns, for total returns it is 13 out of 20. When looking at the 20 days estimation window, these numbers are respectively 14 out of 21 and 14 out of 20 (Table 2). Furthermore, roughly the same numbers can be observed when looking at the effect of attacks on global and regional indices (Tables 1 & 2). Furthermore, this belief that terrorism negatively impacts financial markets is strengthened by the fact that only a few average returns before an attack are actually negative, most indices have positive average returns. Still, as mentioned above, most event day returns are negative. Nevertheless, these findings can of course only be interpreted as an indication, as significant effects are needed in order to assess a causal relationship between terrorist attacks and stock index returns.

In order to assess the immediate impact of terrorist attacks on stock indices, more careful analysis of event day returns has to be performed. Kollias, Papadamou and Stagiannis (2010) and Johnson and Nedelscu (2006) found that the attacks that happened in the first decade of the 21st century had significant negative impacts on their respective financial market. These attacks consist of 9/11, the 2004 Madrid Bombings and the 2005 London Bombings. All three attacks were performed in the name of radical Islamic ideology. When looking at Table 5, the same effects can be observed. In fact, the Madrid and London bombings resulted in significant drops of respectively -2.28% and -1.53% of their major stock index (IBEX 35 & FTSE 100, Table 5). Both drops are significant at 1%. The sizes of the drops are similar when looking at the effect of both attacks on total returns, for both 20 and 45 days estimation windows (Tables 6, 7 & 8). The fact that the size and the significance are about the same for both estimation windows and for normal and total returns, leaves little doubt on the negative impact of those attacks on their respective stock market. Furthermore, both attacks also resulted in highly negative and significant event day returns on a European perspective. In fact, event day abnormal returns on the MSCI Europe were about -2.00% for London and -2.78% for Madrid, again at 1% significance. (Table 5). Nevertheless, only the Madrid bombings seemed to have a global impact. Significant abnormal returns of -1.71% can be observed on the MSCI World (table 5). These results are robust against changes in the estimation window and to changes from normal to total returns (Table 13-15). 9/11 is known to have had a major impact on the economy as a whole. This is especially true regarding financial markets. In

fact, 9/11 resulted in significant abnormal returns of -4.73% when looking at the S&P 500 (Table 5). This drop in the stock index is even more striking when taking into account that the New York Stock Exchange was closed for 4 days after the attack. If the closure did not happen, it is reasonably assumable that the size of the event day abnormal returns would have been even bigger. This is due to the fact, that the closure gave market players time to "digest" the attack. This closure is probably also the reason why 9/11 did not seem to have global impact (Table 5). This is due to the fact that the MSCI World partly consist of companies listed on the NYSE, which did not impact the MSCI World on the day of the attack. Again, the impact of 9/11 is robust to the length of the estimation window and to the reinvestments of capital gains. The consistency of the results can be seen in Tables 13-15.

Van Veen and Bonekamp (2017) found out that the effect of terrorism on financial markets diminished over time. In order to verify this claim, attacks in the 2010s are as well investigated. Out of the 15 attacks with radical Islamic background that happened in the 2010s, only three have significantly negative event day abnormal returns. Those three attacks consist of the 2013 Boston Bombings, the 2015 San Bernardino Attack and the 2017 Westminster Bridge Attack. In fact, the Boston attack resulted in abnormal returns of -2.41% on a national level (S&P 500) and -1.86% on a global level (MSCI World, Table 5). Again, nearly identical results are found for a 20 days estimation period and total returns (Tables 6-8). Nevertheless, it should be noticed that event day abnormal returns for the Westminster and the San Bernardino attacks are only significant at 10%, while significance regarding the Boston Bombings is way over 1% (t-value of -3.87, Table 5). The consistency of the results is shown in Tables 13-15. It is important to notice that European markets seem to be efficient in absorbing the effect of terrorism, as except for a weak effect of the aforementioned Westminster attack, all jihadist inspired attacks on European soil have no significant impacts on their respective financial market.

Even though, right wing terrorism only accounts for four attacks in the 2010s and none in the 2000s, it still important to investigate those attacks. As previously mentioned, these attacks consist of the 2012 Wisconsin Attack and the 2015 Charleston Attack for the US, the 2011 Breivik attack in Norway and the 2017 Quebec attack on Canadian soil. Except for the latter, all attacks proved to be insignificant (Table 5) The Quebec attack resulted in event day abnormal returns of -1.17% on its domestic index and -0.73% on the MSCI World (Table 5). While the domestic effect is significant at a 1% level, the global effect only is at 10%. Compared to the right wing attacks in the US, the significance of the attack in Canada could be attributed to the fact that it was the first terrorist attack in recent Canadian history that resulted in civilian casualties. Except for the Charleston Attack, similar results in terms of size and significance can observed when looking at the 20 days estimation window and total returns (Table 6-8). Surprisingly, only considering a 20 days estimation period, the aforementioned attack resulted in significantly positive event day abnormal returns, both on the S&P 500 and the MSCI World, at 10% significance (Table 7).

The findings for event day abnormal returns have three major implications. Firstly, these results are in accordance with previous literature, as the effect of terrorism on financial markets seems to

have diminished over time. All attack in the 2000s had a very important impact on stock indices, whereas the attacks in the 2010s had more moderate effects (4 out of 19 attacks significant). Nevertheless, this can also be due to the fact that except for the Paris and the Breivik attacks, attacks in the 2000s resulted in far more casualties than those in the 2010s. Furthermore, terrorist attacks seem to have a stronger short term effect on North American financial markets than on European ones. In fact, 4 out 7 attacks on North American soil had significant effects whereas this number goes down to 3 out 15 for Europe. Furthermore, radical Islamic inspired attacks (6 out 18) affect financial markets in a stronger way than right wing inspired attacks (1 out of 4). Moreover, most attacks that have a significant effect on their domestic stock markets also impact MSCI indices significantly. This can be due to spillover effects observed by Chesney, Karaman and Reshetar (2011).

The fact that the findings for event day abnormal returns are so consistent, regarding the robustness towards a change in the estimation window and the change from normal to total returns (Tables 13-15), leaves little doubt that terrorist attacks can significantly impact financial markets in the aforementioned cases (attacks in the 2000s, on North American soil and of jihadist nature).Therefore, the hypothesis that *Event day abnormal returns are equal to 0,* can be refuted in the aforementioned cases.

b) Cumulative Abnormal Returns

As for the event day abnormal returns, the number of negative cumulative abnormal returns can be observed in Tables 3 and 4. Most cumulative abnormal returns prove to be negative. In fact, for an estimation window of 20 days and normal return indices, respectively 14 out 21 attacks and 13 out 21 attacks resulted in respectively negative 5 and 10-days CAR (Table 3). These numbers are roughly the same for a 45 days estimation period and for total returns (Table 4). It is striking that about the same number of attacks resulted in negative event day abnormal returns and cumulative abnormal returns. Again, these findings can only be interpreted as an indication. Significance will be approached in the following paragraphs.

In order to properly assess if the terrorist attacks have longer lasting effects on financial markets, more careful analysis in terms of significance has to be performed. This is done through 5 and 10 days cumulative abnormal returns. When looking at 5 days CAR, only three attacks proved to have a significant impact on their domestic stock index. These attacks consist of 9/11, the 2016 Orlando Shootings and the 2012 Toulouse-Montauban Attacks. 9/11 had the biggest impact, with negative 5 days CAR of -11.20%, significant at 1%. Those numbers are -1.49% and -4.67% for respectively the Orlando and the Toulouse attacks (Table 9). The first is significant at 10% and the latter at 1%. The same results are found for total returns. Nevertheless, when looking at 5 day CAR with an estimation period of 20 days, also the 2016 Berlin and the 2017 Manchester attacks proved to have significantly negative CAR, though only at 10% significance (Table 11). Furthermore, the 2015 Copenhagen Attack, the 2017 Stockholm Attack and the 2014 Brussels Attack have significantly

positive 5 day CAR (Table 11). Expect for 9/11, all the aforementioned attacks did not have any immediate impact on their respective domestic stock market, when looking at event day abnormal returns.

When looking at 10 days cumulative abnormal returns, only the 2012 Toulouse-Montauban attacks also results in 1% significantly negative CAR (-7.49%, Table 9). The effects of 9/11 and the 2016 Orlando Attack seem to have vanished. The fact that the Toulouse-Montauban Attacks had such a long lasting impact could be due to the fact that Mohamed Merah, the perpetrator, was only caught and neutralized by the police, a few days after his last attack. Generally, terrorists are caught, neutralized or kill themselves on the day of the attack. In addition to the aforementioned attack, the 2011 Breivik attack also resulted in significantly negative 10 days CAR (-6.48%, significant at 5%, Table 9). It has to be noted that this attack is the only right wing terrorist attack with significant longer lasting effects on its domestic stock index. Both the 2015 Charlie Hebdo as well as the 2015 Copenhagen attacks resulted into significantly positive CAR (Table 9). Contrary to the findings with regard to event day abnormal return, cumulative abnormal returns are not pronounced for North America. Furthermore, significant cumulative abnormal returns, both for 5 and 10 days, are found after attacks on European Soil. In fact, 7 out of the 15 European attacks resulted in either positive or negative significant 5 days cumulative abnormal returns on the MSCI World (Tables 18-19). This number goes down to 5 out of 15 for 10 days CAR (Tables 18-19). When looking at European effects, these numbers reduce to respectively 1 and 3 out of 15 (Table 20-21).

In contradiction to event day abnormal returns, the aforementioned findings for cumulative abnormal returns do not seem to be robust to changes in the estimation window and to the reinvestments of capital gains. In fact, the consistency found between total and normal returns, and between estimation windows, cannot be observed, for both 5 and 10 days CAR. These inconsistencies can be observed throughout Tables 16-17 and are even more pronounced when looking at global and regional stock indices (Tables 18-21). Therefore, these findings cannot be considered to be robust against the aforementioned changes, which suggest that the findings have little explanatory value. While the hypothesis that *Cumulative abnormal returns are equal to 0,* can be refuted because of the high number of significant cumulative abnormal returns, it is not possible to attribute those effects to terrorist attacks, as the results are too random and too inconsistent. Thus terrorist attacks do not seem to have longer lasting impacts on financial markets. This paper conjectures that those significant findings are possibly due to other, disregarded macro-economic phenomena. The fact that multiple attacks even "resulted" in positive cumulative abnormal returns, strengthens the aforementioned conjecture, as it is reasonably assumable that terrorist attacks cannot have positive effects on financial markets.

6. Conclusion

This paper investigates the effect of terrorist attacks on financial markets. 22 attacks in 10 different Western countries in the Northern hemisphere are looked into. All investigated attacks happened in the 21st century. In order to assess the impact of terrorism on financial markets, an event study methodology is applied. In fact, event day abnormal returns and cumulative abnormal returns are calculated in order to investigate respectively immediate and longer lasting effects on stock indices. They are looked into on three different levels, the domestic level, the regional level and the global level, through respectively the major domestic stock index where an attack happened, the MSCI Europe for attacks on European soil and the MSCI World for all attacks. Furthermore, this paper does not only look into the size and the significance of the aforementioned effects, but also differentiates between radical Islamic and right wing inspired terrorist attacks. Most attacks, 18 out of 22, were performed in the name of radical Islam. In order to assess if the effects of terrorism on stock indices are not due to randomness, results are checked for robustness by taking into account different estimation windows and by looking into event day abnormal returns and cumulative abnormal returns, both on normal returns and on total return indices.

Do terrorist attacks impact stock index returns? Results with regard to event day abnormal returns show that all attacks which happened in the 2000s had a significantly short term negative impact on financial markets. In addition to the fact that 4 out 19 attacks in the 2010s had a significant impact on stock indices, the aforementioned results imply that terrorist attacks indeed have an immediate negative impact on financial markets, even though these impacts diminished over time. These results are in support of the findings of Van Veen and Bonekamp (2017) which also found diminishing effects over time. Furthermore, attacks on North American soil proved to have a stronger immediate impact than those in Europe. This finding adds to existing literature because, even though Arin, Ciferri and Spagnolo (2008) found European markets to be the most efficient in absorbing terrorist attacks, they did not compare it to the US and Canada, only to developing countries. Finally, another new finding is that the ideology behind an attack also plays a role on the impact of terrorism on stock indices, as right wing inspired attacks affect stock markets to a lesser degree than radical Islamic inspired terrorism. Nevertheless, terrorism inspired by different ideologies than the mentioned ones has not been considered in this paper. A relatively high number of significant cumulative abnormal returns can be observed after terrorist attacks, both positive and negative. Nevertheless, these findings are not robust to changes in the estimation window and changes with regards to normal and total return indices, implying that these findings cannot be interpreted as causal and thus, have little explanatory value. The aforementioned findings are probably due to randomness or other phenomena that disregarded in this paper. Therefore, terrorist attacks do not seem to have longer lasting impacts on stock markets. All the aforementioned findings imply that that financial markets are still not completely efficient in absorbing the effect of terrorism in the short term, but markets seem to recover very quickly, as longer lasting impacts are not found.

As previously mentioned, this paper investigates the effect of terrorism on financial markets through major stock indices. This limits the meaningfulness of this paper's findings, as terrorist attacks could impact specific industries differently. In fact, Chesney, Karaman and Reshetar (2011) found insurance and airlines stocks to be the most affected by terrorism. Furthermore, not only industry effects can be investigated but also different types of financial markets. This paper only uses stock indices as a proxy for financial markets, but also other markets as bonds and currency markets can be looked into. Furthermore, even though the robustness of the findings is looked into, the scope of this paper does not allow to be completely sure that the effects that are found can surely be attributed to terrorist attacks. Another limitation of this paper is that the event study methodology does not enable to investigate the effects of specifics about an attack, as the number of casualties and injuries, if an attack has been a suicide attack or not, etc. Further research could deepen into this issue by using a more sophisticated regression analysis. Furthermore, further research should also investigate the impact of terrorism on non-western countries as regions like the Middle-East and countries like Afghanistan and Pakistan have nowadays the highest number of terrorist attacks.

Appendix

Except for tables 1-4, all values represent either event abnormal or cumulative abnormal returns in %. Numbers between brackets are the associated t-values. *, ** and *** indicate significance at respectively 10%, 5% and 1%. Numbers in bold are significant.

- **Table 1.** Numbers of negative event day abnormal returns in comparison with negative average returns in the estimation period (20 days).

Estimation Window: 20 Days		Negative Event Day Abnormal Returns	Negative Average Returns Before an Attack	Number of Attacks
Domestic Effects	Domestic Normal Return Index	14	5	21
	Domestic Total Return Index	14	3	20
Global Effects	MSCI World	12	6	22
	MSCI World Total Return	13	5	22
Regional Effects	MSCI Europe	8	2	15
	MSSCI Europe Total Return	9	1	15

- **Table 2.** Numbers of negative event day abnormal returns in comparison with negative average returns in the estimation period (45 days).

Estimation Window: 45 Days		Negative Event Day Abnormal Returns	Negative Average Returns Before an Attack	Number of Attacks
Domestic Effects	Domestic Normal Return Index	13	3	21
	Domestic Total Return Index	13	2	20
Global Effects	MSCI World	12	3	22
	MSCI World Total Return	12	3	22
Regional Effects	MSCI Europe	8	1	15
	MSSCI Europe Total Return	9	1	15

- **Table 3.** Numbers of negative cumulative abnormal returns in comparison with the total number of attacks (5 and 10 days CAR, 20 days estimation period).

Estimation Window: 20 Days		Negative 5-Days CAR	Negative 10-days CAR	Number of Attacks
Domestic Effects	Domestic Normal Return Index	14	13	21
	Domestic Total Return Index	14	14	20
Global Effects	MSCI World	14	14	22
	MSCI World Total Return	14	14	22
Regional Effects	MSCI Europe	12	10	15
	MSSCI Europe Total Return	12	11	15

- **Table 4.** Numbers of negative cumulative abnormal returns in comparison with the total number of attacks (5 and 10 days CAR, 45 days estimation period).

Estimation Window: 45 Days		Negative 5-Days CAR	Negative 10-days CAR	Number of Attacks
Domestic Effects	Domestic Normal Return Index	11	12	21
	Domestic Total Return Index	13	13	20
Global Effects	MSCI World	13	15	22
	MSCI World Total Return	13	15	22
Regional Effects	MSCI Europe	10	9	15
	MSSCI Europe Total Return	10	9	15

- **Table 5.** Event day abnormal returns for domestic, global and regional indices (normal return indices, 45 days estimation period).

Estimation Window: 45 Days

	Attack	*Domestic Index*	*MSCI World*	*MSCI Europe*
United States	New York (2001)	**-4.73% (-4.47)***	-1.31% (1.62)	-
(S&P 500)	Wisconsin (2012)	0.09% (0.09)	0.45% (0.43)	-
	Boston (2013)	**-2.41% (-3.87)***	**-1.82% (-3.26)***	-
	Charleston (2015)	0.98%% (1.60)	**1.08* (1.88)***	-
	San Bernardino (2015)	**-1.35% (-1.67)***	-1.03% (1.47)	-
	Orlando (2016)	-0.87%(-1.49)	**-1.22% (-2.06)***	-
Germany	Berlin (2016)	-	0.06% (0.12)	0.35% (0.54)
(DAX)				
France	Toulouse-Montauban (2012)	-0.74% (-0.69)	0.14% (0.22)	-0.31% (-0.38)
(CAC 40)	Paris - Charlie Hebdo (2015)	0.73% (0.53)	0.53% (0.80)	0.49% (0.50)
	Paris - Nov. 13th (2015)	-1.13% (-0.79)	0.75% (0.87)	0.20% (0.15)
	Nice (2016)	-0.36% (-0.19)	-0.23% (-0.20)	-0.21% (-0.12)
United Kingdom	London (2005)	**-1.53% (-3.43)***	-0.44% (-1.08)	**-2.00% (3.99)***
(FTSE 100)	London - Westminster Bridge (2017)	**-0.78% (-1.80)***	-0.28% (-0.76)	-0.49% (-0.95)
	Manchester (2017)	-0.19% (-0.28)	0.04% (0.09)	0.15% (0.28)
	London - London Bridge (2017)	-0.37% (-0.58)	-0.28% (-0.64)	-0.17% (-0.34)
Belgium	Brussels (2014)	0.47% (0.76)	0.25% (0.51)	0.45% (0.72)
(BEL 20)	Brussels (2016)	0.11% (0.07)	-0.19% (-0.19)	-0.26% (-0.15)
Canada	Quebec (2017)	**-1.17% (-2.58)***	**-0.73% (1.88)***	-
(S&P/ TSX Composite)				
Denmark	Copenhagen (2015)	0.05% (0.05)	-0.06% (-0.08)	-0.43% (-0.39)
(OMX Copenhagen)				
Sweden	Stockholm (2017)	0.34% (0.66)	0.01% (0.02)	0.04% (0.08)
(OMX Stockholm 30)				
Norway	Oslo & Utoya (2011)	0.87% (0.69)	0.37% (0.38)	0.63% (0.72)
(OBX)				
Spain	Madrid (2004)	**-2.28% (-3.53)***	**-1.71% (-3.10)***	**-2.78% (-4.94)***
(IBEX 35)				

- **Table 6.** Event day abnormal returns for domestic, global and regional indices (total return indices, 45 days estimation period).

Estimation Window: 45 Days

	Attack	Domestic Index (Total)	MSCI World (Total)	MSCI Europe (Total)
United States (S&P 500)	New York (2001)	**-4.71% (-4.45)***	-1.28% (-1.63)	-
	Wisconsin (2012)	0.09% (0.08)	0.45% (0.43)	-
	Boston (2013)	**-2.41% (-3.88)***	**-1.81% (-3.26)***	-
	Charleston (2015)	0.99% (1.61)	**1.07% (1.87)***	-
	San Bernardino (2015)	**-1.34% (2.14)****	-1.03% (-1.47)	-
	Orlando (2016)	-0.85% (-1.46)	**-1.22% (-2.07)****	-
Germany (DAX)	Berlin (2016)	0.14% (0.18)	0.06% (0.12)	0.34% (0.53)
France (CAC 40)	Toulouse-Montauban (2012)	-0.56% (-0.52)	0.14% (0.22)	-0.31% (0.37)
	Paris - Charlie Hebdo (2015)	0.73% (0.52)	0.54% (0.81)	0.48% (0.44)
	Paris - Nov. 13th (2015)	-1.14% (-0.80)	0.76% (0.88)	0.19% (0.15)
	Nice (2016)	-0.39% (-0.21)	-0.24% (-0.21)	-0.23% (-0.13)
United Kingdom (FTSE 100)	London (2005)	**-1.54% (-3.41)***	-0.45% (-1.09)	-2.01% (-3.97)
	London - Westminster Bridge (2017)	**-0.80% (-1.88)***	-0.28% (-0.77)	-0.50% (-0.98)
	Manchester (2017)	-0.21% (-0.32)	0.03% (0.07)	0.13% (0.24)
	London - London Bridge (2017)	-0.39% (-0.62)	-0.28% (-0.65)	-0.18% (-0.36)
Belgium (BEL 20)	Brussels (2014)	0.55% (0.89)	0.24% (0.49)	0.43% (0.69)
	Brussels (2016)	0.10% (0.07)	-0.20% (-0.19)	-0.27% (-0.16)
Canada (S&P/ TSX Composite)	Quebec (2017)	**-1.15% (-2.51)***	**-0.73% (-1.87)***	-
Denmark (OMX Copenhagen)	Copenhagen (2015)	-	-0.07% (-0.08)	-0.44% (-0.40)
Sweden (OMX Stockholm 30)	Stockholm (2017)	0.29% (0.56)	0.01% (0.04)	0.03% (0.07)
Norway (OBX)	Oslo & Utoya (2011)	-	0.37% (0.38)	-0.18% (-0.21)
Spain	Madrid (2004)	**-2.29% (-3.55)***	**-1.70% (-3.10)***	**-2.79% (-4.96)***

- **Table 7.** Event day abnormal returns for domestic, global and regional indices (normal return indices, 20 days estimation period).

Estimation Window: 20 Days

	Attack	*Domestic Index*	*MSCI World*	*MSCI Europe*
United States	New York (2001)	**-4.50% (-4.27)***	-1.08% (-1.28)	-
(S&P 500)	Wisconsin (2012)	0.10% (0.10)	0.52% (0.49)	-
	Boston (2013)	**-2.38% (-4.04)***	**-1.79% (-3.20)***	-
	Charleston (2015)	**1.05% (1.90)***	**1.17% (1.91)***	-
	San Bernardino (2015)	-1.10% (-1.48)	-0.79% (-1.38)	-
	Orlando (2016)	-0.89% (-1,51)	**-1.27% (-2.13)****	-
Germany	Berlin (2016)	-	0.01% (0.02)	0.21% (0.37)
(DAX)				
France	Toulouse-Montauban (2012)	-0.70% (-0.60)	0.23% (0.30)	-0.24% (-0.26)
(CAC 40)	Paris - Charlie Hebdo (2015)	0.99% (0.58)	0.70% (0.75)	0.62% (0.50)
	Paris - Nov. 13th (2015)	-1.12% (-1.05)	0.88% (1.47)	0.21% (0.23)
	Nice (2016)	-0.60% (-0.24)	-0.39% (-0.26)	-0.45% (-0.19)
United Kingdom	London (2005)	**-1.59% (-3.45)***	**-0.42% (-1.11)**	**-1.97% (-4.11)***
(FTSE 100)	London - Westminster Bridge (2017)	**-0.80% (-1.68)***	-0.21% (-0.54)	-0.44% (-0.93)
	Manchester (2017)	-0.41% (-0.65)	0.00% (0.01)	0.15% (0.33)
	London - London Bridge (2017)	-0.49% (-1.21)	-0.28% (-0.67)	-0.08% (-0.21)
Belgium	Brussels (2014)	0.50% (0.90)	0.23% (0.66)	0.43% (0.93)
(BEL 20)	Brussels (2016)	0.10% (0.10)	-0.28% (-0.35)	-0.30% (-0.25)
Canada	Quebec (2017)	**-1.14% (-2.17)****	**-0.78% (-2.17)****	-
(S&P/ TSX Composite)				
Denmark	Copenhagen (2015)	-0.08% (-0.10)	-0.19% (-0.29)	-0.47% (-0.70)
(OMX Copenhagen)				
Sweden	Stockholm (2017)	0.42% (0.84)	0.04% (0.12)	0.05% (0.11)
(OMX Stockholm 30)				
Norway	Oslo & Utoya (2011)	0.54% (0.44)	0.13% (0.13)	0.43% (0.49)
(OBX)				
Spain	Madrid (2004)	**-2.24% (-3.47)***	**-1.60% (-2.64)***	**-2.76% (-4.53)***

- **Table 8.** Event day abnormal returns for domestic, global and regional indices (total return indices, 20 days estimation period).

Estimation Window: 20 Days

	Attack	Domestic Index (Total)	MSCI World (Total)	MSCI Europe (Total)
United States (S&P 500)	New York (2001)	**-4.47% (-4.24)***	-1.08% (-1.28)	-
	Wisconsin (2012)	0.09% (0.10)	0.53% (0.50)	-
	Boston (2013)	**-2.39% (-4.04)***	**-1.78% (-3.19)***	-
	Charleston (2015)	**1.06% (1.90)***	**1.17% (1.91)***	-
	San Bernardino (2015)	**-1.09% (1.83)***	-0.88% (-1.53)	-
	Orlando (2016)	-0.87% (-1.48)	**-1.26% (-2.14)**	-
Germany (DAX)	Berlin (2016)	-0.01% (-0.08)	0.01% (0.02)	0.21% (0.36)
France (CAC 40)	Toulouse-Montauban (2012)	-0.52% (-0.45)	0.22% (0.30)	-0.24% (-0.26)
	Paris - Charlie Hebdo (2015)	0.97% (0.57)	0.68% (0.76)	0.62% (0.50)
	Paris - Nov. 13th (2015)	-1.12% (-1.06)	0.88% (1.48)	0.20% (0.22)
	Nice (2016)	-0.61% (-0.25)	-0.40% (-0.26)	-0.46% (-0.20)
United Kingdom (FTSE 100)	London (2005)	**-1.59% (-3.44)***	-0.42% (-1.12)	**-1.98% (-4.11)***
	London - Westminster Bridge (2017)	**-0.83% (1.76)***	-0.22% (-0.55)	-0.46% (-0.95)
	Manchester (2017)	-0.44% (-0.73)	-0.01% (-0.02)	0.12% (0.26)
	London - London Bridge (2017)	-0.52% (-1.39)	-0.29% (-0.70)	-0.09% (-0.25)
Belgium (BEL 20)	Brussels (2014)	0.54% (1.01)	0.21% (0.62)	0.40% (0.86)
	Brussels (2016)	0.10% (0.10)	-0.28% (-0.35)	-0.32% (-0.26)
Canada (S&P/ TSX Composite)	Quebec (2017)	**-1.12% (-2.12)**	**-0.77% (-2.16)**	-
Denmark (OMX Copenhagen)	Copenhagen (2015)	-	-0.19% (-0.30)	-0.48% (-0.71)
Sweden (OMX Stockholm 30)	Stockholm (2017)	0.31% (0.60)	0.05% (0.13)	0.04% (0.10)
Norway (OBX)	Oslo & Utoya (2011)	-	0.13% (0.13)	-0.37% (-0.42)
Spain (IBEX)	Madrid (2004)	**-2.24% (-3.47)***	**-1.60% (-2.65)***	**-2.77% (-4.56)***

- **Table 9.** 5 and 10 days cumulative abnormal returns (normal returns, 45 days estimation period).

Estimation Window: 45 Days	Attack	Domestic Index		MSCI World		MSCI Europe	
		5 Days CAR	10 Days CAR	5 Days CAR	10 Days CAR	5 Days CAR	10 Days CAR
United States (S&P 500)	New York (2001)	**-11.20% (-3.02)***	-2.67% (-0.34)	-2.91% (-1.23)	-3.76% (-0.61)	-	-
	Wisconsin (2012)	0.37% (1.02)	0.55% (0.74)	0.47% (0.69)	0.39% (0.37)	-	-
	Boston (2013)	0.12% (0.05)	-1.48% (-0.57)	-2.72% (-1.29)	-0.61% (-0.22)	-	-
	Charleston (2015)	0.36% (0.25)	-1.13% (-0.43)	1.47% (0.91)	-0.55% (-0.19)	-	-
	San Bernardino (2015)	-3.08% (-1.11)	-5.29% (-1.44)	-3.42% (-2.04)	-5.95% (-2.43)	-	-
	Orlando (2016)	**-1.49% (-1.85)***	-3.36% (-0.86)	-2.00% (-1.42)	-3.75% (-0.67)	-	-
Germany (DAX)	Berlin (2016)	-	-	**-0.48% (-2.13)***	**-1.25% (-1.92)***	-0.54% (-0.90)	0.14% (0.13)
France (CAC 40)	Toulouse-Montauban (2012)	**-4.67% (-3.17)***	**-7.49% (-2.58)***	**-2.03% (-2.06)***	-2.80% (-1.49)	**-3.46% (-2.85)***	**-5.33% (-2.13)***
	Paris - Charlie Hebdo (2015)	5.15% (1.31)	**8.88% (1.80)***	1.73% (0.86)	2.44% (1.04)	3.89% (1.29)	**7.18% (1.67)***
	Paris - Nov. 13th (2015)	0.57% (0.19)	0.56% (0.15)	**2.70% (4.45)***	**2.35% (1.86)***	2.90% (1.38)	2.96% (0.96)
	Nice (2016)	-1.72% (-1.25)	0.17% (0.09)	-0.26% (-0.39)	-0.51% (-0.74)	0.27% (0.25)	-0.46% (-0.29)
United Kingdom (FTSE 100)	London (2005)	-0.48% (-0.23)	-1.88% (-0.84)	1.76% (1.33)	2.08% (1.39)	-0.59% (-0.24)	-1.29% (-0.50)
	London - Westminster Bridge (2017)	-0.71% (-0.61)	-1.25% (-0.79)	0.28% (0.39)	-0.58% (-0.64)	0.06% (0.05)	0.38% (0.27)
	Manchester (2017)	0.20% (0.33)	-0.02% (-0.03)	0.09% (0.25)	0.87% (1.00)	-0.34% (-1.04)	-0.48% (-0.77)
	London - London Bridge (2017)	-0.65% (-0.50)	-1.89% (-1.16)	**-1.13% (-4.38)***	-1.58% (-1.52)	-0.80% (-1.11)	-1.55% (1.03)
Belgium (BEL 20)	Brussels (2014)	0.75% (1.58)	0.95% (0.95)	**0.71% (1.81)***	**1.53% (2.39)***	0.11% (0.21)	0.40% (0.42)
	Brussels (2016)	-0.29% (-0.14)	-2.77% (-0.90)	**-1.92% (-2.22)***	-2.05% (1.27)	-2.15% (-1.64)	-2.93% (-1.11)
Canada (S&P/ TSX Composite)	Quebec (2017)	-0.98% (-0.83)	0.29% (0.19)	-0.40% (-0.47)	-0.42% (-0.38)		
Denmark (OMX Copenhagen)	Copenhagen (2015)	**4.62% (3.79)***	**7.67% (4.33)***	0.39% (1.30)	0.14% (0.29)	-0.16% (-0.22)	0.91% (0.77)
Sweden (OMX Stockholm 30)	Stockholm (2017)	0.47% (1.05)	2.70% (1.09)	**-1.03% (-2.00)***	-0.81% (-0.63)	-068% (1.56)	-1.95% (1.51)
Norway (OBX)	Oslo & Utoya (2011)	-0.30% (-0.17)	**-6.48% (-2.00)***	-1.85% (-1.01)	**-6.18% (-2.60)***	-0.86% (-0.70)	**-9.72% (2.77)***
Spain (IBEX)	Madrid (2004)	-4.63% (-0.93)	-7.62% (-1.37)	-0.53% (-0.21)	-2.84% (-1.02)	-2.82% (-0.81)	-6.27% (-1.51)

- **Table 10.** 5 and 10 days cumulative abnormal returns (total returns, 45 days estimation period).

Estimation Window: 45 Days	Attack	Domestic Index (Total)		MSCI World (Total)		MSCI Europe (Total)	
		5 Days CAR	10 Days CAR	5 Days CAR	10 Days CAR	5 Days CAR	10 Days CAR
United States (S&P 500)	New York (2001)	**-11.18% (-3.39)***	-2.64% (-0.34)	-2.91% (-1.23)	-3.74% (-0.60)	-	-
	Wisconsin (2012)	0.42% (1.21)	0.64% (0.89)	0.52% (0.80)	0.47% (0.46)	-	-
	Boston (2013)	-2.69% (-0.86)	1.55% (-0.44)	-2.73% (-1.30)	-0.60% (-0.22)	-	-
	Charleston (2015)	0.35% (0.23)	-1.13% (-0.42)	1.44% (0.89)	-0.60% (-0.21)	-	-
	San Bernardino (2015)	-3.08% (-1.11)	-5.29% (-1.45)	**-3.42% (-2.05)**	**-5.96% (-2.45)**	-	-
	Orlando (2016)	**-1.47% (1.84)***	-3.37% (-0.86)	-2.03% (-1.44)	-3.81% (-0.69)	-	-
Germany (DAX)	Berlin (2016)	-0.55% (1.52)	-0.53% (-0.49)	**-0.49% (-2.16)**	**-1.25% (-1.97)**	-0.56% (-0.94)	0.11% (0.10)
France (CAC 40)	Toulouse-Montauban (2012)	**-4.49% (-2.98)***	**-7.31% (-2.52)***	**-2.04% (-2.07)**	-2.73% (-1.48)	**-3.46% (-2.83)***	**-5.33% (-2.14)**
	Paris - Charlie Hebdo (2015)	5.11% (1.30)	**8.81% (1.79)***	1.72% (0.85)	2.41% (1.03)	3.87% (1.28)	**7.16% (1.66)***
	Paris - Nov. 13th (2015)	0.57% (0.19)	0.54% (0.14)	**2.71% (4.47)***	**2.35% (1.85)***	2.90% (1.38)	2.96% (0.96)
	Nice (2016)	-0.68% (-0.50)	-0.15% (-0.08)	-0.29% (-0.44)	-0.57% (-0.82)	0.20% (0.18)	-0.59% (-0.37)
United Kingdom (FTSE 100)	London (2005)	-0.55% (-0.26)	-2.01% (-0.89)	1.73% (1.31)	2.01% (1.35)	-0.67% (-0.27)	-1.44% (-0.56)
	London - Westminster Bridge (2017)	-0.83% (-0.71)	-1.41% (-0.89)	0.26% (0.36)	-0.53% (-0.59)	0.03% (0.02)	0.41% (0.29)
	Manchester (2017)	0.12% (0.19)	-0.14% (-0.17)	0.06% (0.16)	0.83% (0.95)	-0.43% (-1.29)	-0.57% (-0.91)
	London - London Bridge (2017)	-0.60% (-0.48)	-1.91% (-1.20)	**-1.15% (-4.41)***	-1.63% (-1.56)	-0.87% (-1.19)	-1.72% (-1.15)
Belgium (BEL 20)	Brussels (2014)	0.87% (1.46)	0.90% (0.86)	**0.67% (1.74)***	**1.47% (2.30)**	0.04% (0.07)	0.26% (0.27)
	Brussels (2016)	-0.30% (-0.15)	-2.79% (-0.91)	**-1.94% (-2.26)**	-2.00% (-1.22)	**-2.17% (-1.68)***	-2.96% (-1.13)
Canada (S&P/ TSX Composite)	Quebec (2017)	-1.01% (-0.87)	0.20% (0.14)	-0.40% (-0.46)	-0.40% (-0.37)	-	-
Denmark (OMX Copenhagen)	Copenhagen (2015)	-	-	0.41% (1.39)	0.17% (0.36)	-0.12% (-0.17)	0.94% (0.80)
Sweden (OMX Stockholm 30)	Stockholm (2017)	0.22% (0.50)	2.28% (0.92)	**-1.06% (2.03)**	-0.86% (-0.67)	-0.66% (-1.56)	-1.94% (1.51)
Norway (OBX)	Oslo & Utoya (2011)	-	-	-2.34% (-1.44)	**-10.47% (-2.55)***	**-2.15% (-2.43)**	**-12.04% (-3.87)***
Spain (IBEX)	Madrid (2004)	-4.68% (-0.94)	-7.66% (-1.37)	-0.50% (-0.20)	-2.81% (-1.01)	-2.74% (-0.77)	-6.18% (-1.47)

- **Table 11.** 5 and 10 days cumulative abnormal returns (normal returns, 20 days estimation period).

Estimation window: 20 Days		**Domestic Index**		**MSCI World**		**MSCI Europe**	
	Attacks	*5 Days CAR*	*10 Days CAR*	*5 Days CAR*	*10 Days CAR*	*5 Days CAR*	*10 Days CAR*
United States	New York (2001)	**-10.02% (-3.02)***	-0.31% (-0.04)	-1.74% (-0.73)	-1.42% (-0.23)	-	-
(S&P 500)	Wisconsin (2012)	0.38% (1.02)	0.57% (0.76)	0.84% (1.24)	1.13% (1.07)	-	-
	Boston (2013)	-2.50% (-0.80)	-1.19% (-0.46)	-2.57% (-1.22)	-0.31% (-0.11)	-	-
	Charleston (2015)	0.71% (0.49)	-0.43% (-0.16)	1.92% (1.19)	0.34% (0.12)	-	-
	San Bernardino (2015)	-1.83% (-0.66)	-2.78% (-0.76)	-2.22% (-1.32)	-3.55% (-1.45)	-	-
	Orlando (2016)	**-1.58% (-1.97)**	-3.54% (-0.91)	-2.22% (-1.58)	-4.19% (-0.76)	-	-
Germany	Berlin (2016)	**-**	**-**	**-0.72% (-3.18)***	**-1.73% (-2.65)***	**-1.23% (-2.04)**	-1.23% (-1.16)
(DAX)							
France	Toulouse-Montauban (2012)	**-4.47% (-3.03)***	**-7.10% (-2.45)**	-1.61% (-1.63)	-1.95% (-1.04)	**-3.08% (-2.54)***	**-4.58% (-1.83)***
(CAC 40)	Paris - Charlie Hebdo (2015)	6.39% (1.63)	**11.37% (2.31)**	2.43% (1.21)	3.84% (1.63)	4.57% (1.51)	**8.54% (1.99)**
	Paris - Nov. 13th (2015)	0.66% (0.22)	0.73% (0.19)	**3.33% (5.49)***	**3.61% (2.86)***	2.97% (1.41)	3.10% (1.00)
	Nice (2016)	-1.72% (-1.25)	-2.23% (-1.16)	-1.06% (-1.63)	**-2.12% (-3.06)***	-0.94% (-0.85)	**-2.89% (-1.83)***
United Kingdom	London (2005)	-0.78% (-0.37)	-2.47% (-1.10)	1.88% (1.42)	2.32% (1.55)	-0.46% (-0.19)	-1.03% (-0.40)
(FTSE 100)	London - Westminster Bridge (2017)	-0.83% (-0.71)	-1.47% (-0.93)	0.63% (0.87)	0.10% (0.11)	0.29% (0.24)	0.83% (0.60)
	Manchester (2017)	-0.91% (-1.48)	**-2.25% (-2.92)***	-0.09% (-0.25)	0.51% (0.59)	-0.32% (-0.96)	-0.43% (-0.69)
	London - London Bridge (2017)	-1.28% (-0.99)	-3.14% (-1.93)*	**-1.15% (-4.47)***	-1.63% (-1.56)	-0.36% (-0.49)	-0.65% (-0.43)
Belgium	Brussels (2014)	**0.92% (1.95)***	1.30% (1.30)	0.61% (1.54)	**1.32% (2.06)**	-0.02% (-0.03)	0.14% (0.14)
(BEL 20)	Brussels (2016)	-0.31% (-0.15)	-2.81% (-0.92)	**-2.33% (-2.70)***	**-2.88% (-1.79)***	**-2.36% (-1.80)***	-3.35% (-1.27)
Canada	Quebec (2017)	-0.89% (-0.75)	0.48% (0.32)	-0.62% (-0.72)	-0.84% (-0.47)	-	-
(S&P/ TSX Composite)							
Denmark	Copenhagen (2015)	**3.98% (3.27)***	**6.41% (3.79)***	-0.23% (-0.77)	**-1.10% (-2.24)**	-0.36% (-0.50)	0.50% (0.43)
(OMX Copenhagen)							
Sweden	Stockholm (2017)	**0.87% (1.96)***	3.50% (1.42)	**-0.86% (-1.68)***	-0.47% (-0.37)	-0.63% (-1.46)	-1.87% (-1.45)
(OMX Stockholm 30)							
Norway	Oslo & Utoya (2011)	-1.97% (-1.10)	**-9.83% (-3.04)***	-2.81% (-1.53)	**-8.35% (-3.50)***	-1.84% (-1.49)	**-11.69% (-3.33)***
(OBX)							
Spain	Madrid (2004)	-4.40% (-0.88)	-7.16% (-1.29)	0.00% (-0.00)	-1.78% (-0.64)	-2.71% (-0.78)	-6.05% (-1.46)

- **Table 12.** 5 and 10 days cumulative abnormal returns (total returns, 20 days estimation period).

Estimation Window: 20 Days	*Attacks*	*Domestic Index (Total)*		*MSCI World (Total)*		*MSCI Europe (Total)*	
		5 Days CAR	*10 Days CAR*	*5 Days CAR*	*10 Days CAR*	*5 Days CAR*	*10 Days CAR*
United States	New York (2001)	**-10.00% (-3.03)***	-0.28% (-0.37)	-1.75% (-0.74)	-1.41% (-0.23)	-	-
(S&P 500)	Wisconsin (2012)	0.44% (1.27)	0.68% (0.94)	0.91% (1.39)	1.24% (1.21)	-	-
	Boston (2013)	-2.52% (-0.81)	-1.22% (-0.35)	-2.59% (1.23)	-0.31% (-0.11)	-	-
	Charleston (2015)	0.70% (0.47)	-0.43% (-0.16)	1.91% (1.18)	0.34% (0.12)	-	-
	San Bernardino (2015)	-1.85% (-0.67)	-2.82% (-0.77)	-2.66% (-1.59)	**-4.43% (-1.82)***	-	-
	Orlando (2016)	**-1.57% (-1.97)****	-3.57% (-0.91)	-2.24% (-1.60)	-4.25% (-0.77)	-	-
Germany	Berlin (2016)	**-1.30% (-3.56)***	**-2.02% (-1.88)***	**-0.72% (-3.18)***	**-1.72% (-2.70)***	**-1.23% (-2.09)****	-1.24% (-1.18)
(DAX)							
France	Toulouse-Montauban (2012)	**-4.29% (-2.85)***	**-6.92% (-2.38)****	**-1.63% (-1.65)***	-1.91% (-1.03)	**-3.10% (-2.54)****	**-4.62% (-1.85)***
(CAC 40)	Paris - Charlie Hebdo (2015)	6.34% (1.61)	**11.26% (2.29)****	2.43% (1.20)	3.83% (1.63)	4.75% (1.51)	**8.55% (1.98)****
	Paris - Nov. 13th (2015)	0.67% (0.23)	0.76% (0.20)	**3.34% (5.51)***	**3.61% (2.85)***	2.96% (1.40)	3.07% (0.99))
	Nice (2016)	-1.79% (-1.29)	-2.36% (-1.23)	**-1.08% (-1.65)***	**-2.15% (-3.09)***	-0.98% (-0.89)	**-2.94% (-1.87)***
United Kingdom	London (2005)	-0.80% (-0.38)	-2.50% (-1.11)	1.86% (1.41)	2.29% (1.53)	-0.49% (-0.20)	-1.09% (-0.43)
(FTSE 100)	London - Westminster Bridge (2017)	-0.97% (-0.84)	-1.70% (-1.07)	0.59% (0.82)	0.13% (0.15)	0.23% (0.20)	0.81% (0.58)
	Manchester (2017)	**-1.03% (-1.66)***	**-2.42% (-3.02)***	-0.14% (-0.38)	0.44% (0.50)	-0.46% (-1.39)	-0.64% (-1.01)
	London - London Bridge (2017)	-1.26% (-1.00)	**-3.22% (-2.02)****	**-1.19% (-4.57)***	-1.71% (-1.64)	-0.44% (-0.60)	-0.86% (-0.58)
Belgium	Brussels (2014)	0.83% (1.46)	0.82% (0.79)	0.55% (1.41)	**1.22% (1.91)***	-0.15% (-0.28)	-0.12% (-0.12)
(BEL 20)	Brussels (2016)	-0.31% (-0.15)	-2.81% (-0.92)	**-2.36% (-2.75)***	**-2.84% (-1.74)***	-2.41% (-1.86)*	-3.43% (-1.31)
Canada	Quebec (2017)	-0.90% (-0.77)	0.43% (0.29)	-0.60% (-0.70)	-0.81% (-0.74)	-	-
(S&P/ TSX Composite)							
Denmark	Copenhagen (2015)	-	-	-0.22% (-0.74)	**-1.08% (-2.21)****	-0.34% (-0.47)	0.52% (0.44)
(OMX Copenhagen)							
Sweden	Stockholm (2017)	0.33% (0.75)	2.51% (1.01)	-0.89% (-1.71)*	-0.53% (-0.42)	-0.63% (-1.49)	-1.89% (-1.47)
(OMX Stockholm 30)							
Norway	Oslo & Utoya (2011)	-	-	**-3.53% (-2.16)****	**-12.85% (-3.13)***	**-3.10% (-3.50)***	**-13.93% (-4.45)***
(OBX)							
Spain	Madrid (2004)	-4.40% (-0.88)	-7.11% (1.28)	0.02% (0.01)	-1.78% (-0.64)	-2.66% (-0.75)	-6.02% (-1.44)

The following tables indicate if the significant findings are consistent when looking at both 45 and 20 days estimation windows, as well as both normal and total return indices. This is done in order to investigate to robustness of the findings as explicitly explained previously. Only terrorist attacks with at least one significant value are listed, as attacks without any significance are default consistent. Plus and minus signs between the brackets indicate if a significant increase or decrease in stock prices was found. *, ** and *** again indicate respectively 10%, 5% and 1% significance.

- **Table 13.** Consistency of significant event day abnormal returns on domestic stock indices.

Event Day Abnormal Returns on Domestic Indices	Attacks	Normal Returns, 45 Days	Total Returns, 45 Days	Normal Returns, 20 Days	Total Returns, 20 Days	Consistent
United States	New York (2001)	(-)***	(-)***	(-)***	(-)***	Yes
(S&P 500)	Boston (2013)	(-)***	(-)***	(-)***	(-)***	Yes
	San Bernardino (2015)	(-)*	(-)**	-	(-)*	No
United Kingdom	London (2005)	(-)***	(-)***	(-)***	(-)***	Yes
(FTSE 100)	London - Westminster Bridge (2017)	(-)*	(-)*	(-)*	(-)*	Yes
Canada	Quebec (2017)	(-)***	(-)***	(-)**	(-)**	Yes
(S&P/ TSX Composite)						
Spain	Madrid (2004)	(-)***	(-)***	(-)***	(-)***	Yes
(IBEX 35)					Total	6 out of 7

- **Table 14.** Consistency of significant event day abnormal returns on the MSCI World.

Event Day Abnormal Returns on MSCI WORLD	Attacks	Normal Returns, 45 Days	Total Returns, 45 Days	Normal Returns, 20 Days	Total Returns, 20 Days	Consistent
United States	Boston (2013)	(-)***	(-)***	(-)***	(-)***	Yes
	Charleston (2015)	(+)*	(+)*	(+)*	(+)*	Yes
	Orlando (2016)	(-)**	(-)**	(-)**	(-)**	Yes
Canada	Quebec (2017)	(-)*	(-)*	(-)**	(-)**	Yes
Spain	Madrid (2004)	(-)***	(-)***	(-)***	(-)***	Yes
					Total	**5 out 5**

- **Table 15.** Consistency of significant event day abnormal returns on the MSCI Europe.

Event Day Abnormal Returns on MSCI Europe	Attacks	Normal Returns, 45 days	Total Returns, 45 Days	Normal Returns, 20 Days	Total Returns, 20 days	Consistent
United Kingdom	London (2005)	(-)***	-	(-)***	(-)***	No
Spain	Madrid (2004)	(-)***	(-)***	(-)***	(-)***	Yes
					Total	**1 out of 2**

- **Table 16.** Consistency of significant 5-days cumulative abnormal returns on domestic stock indices.

5-Day CAR on Domestic indices	Attack	Normal Returns, 45 Days	Total Returns, 45 Days	Normal Returns, 20 Days	Total Returns, 20 Days	Consistent
United States (S&P 500)	New York (2001)	(-)***	(-)***	(-)***	(-)***	Yes
	Orlando (2016)	(-)*	(-)*	(-)*	(-)**	Yes
Germany (DAX 30)	Berlin (2016)	N/A	-	N/A	(-)***	No
France (CAC 40)	Toulouse-Montauban (2012)	(-)***	(-)***	(-)***	(-)***	Yes
	Paris - Nov. 13th (2015)	-	-	-	(-)*	No
Belgium (BEL 20)	Brussels (2014)	-	-	(-)*	-	No
Denmark (OMX Copenhagen)	Copenhagen (2015)	(+)***	N/A	(+)***	N/A	Yes
Sweden (OMX Stockholm 30)	Stockholm (2017)	-	-	(+)*	-	No
					Total	**4 out of 8**

- **Table 17.** Consistency of significant 10-days cumulative abnormal returns on domestic stock indices.

10-Day CAR on Domestic indices	Attack	Normal Returns, 45 Days	Total Returns, 45 Days	Normal Returns, 20 Days	Total Returns, 20 Days	Consistent
Germany (DAX 30)	Berlin (2016)	N/A	-	N/A	(-)*	No
France (CAC 40)	Toulouse-Montauban (2012)	(-)***	(-)***	(-)***	(-)**	Yes
	Paris - Charlie Hebdo (2015)	(+)*	(+)*	(+)**	(+)**	Yes
United Kingdom (FTSE 100)	Manchester (2017)	-	-	(-)***	(-)***	No
	London - London Bridge (2017)	-	-	-	(-)**	No
Belgium (BEL 20)	Brussels (2014)	-	-	(-)*	-	No
Denmark (OMX Copenhagen)	Copenhagen (2015)	(+)***	N/A	(+)***	N/A	Yes
Sweden (OMX Stockholm)	Stockholm (2017)	-	-	(+)*	-	No
Norway (OBX)	Oslo & Utoya (2011)	(-)**	N/A	(-)***	N/A	Yes
					Total	**4 out 9**

- **Table 18.** Consistency of significant 5-days cumulative abnormal returns on the MSCI World.

5-Day CAR on MSCI World	Attack	Normal Returns, 45 Days	Total Returns, 45 Days	Normal Returns, 20 Days	Total Returns, 20 Days	Consistent
United States	San Bernardino (2015)		(-)**			No
Germany	Berlin (2016)	(-)**	(-)**	(-)**	(-)**	Yes
France	Toulouse-Montauban (2012)	(-)**	(-)**		(-)**	No
	Paris - Nov. 13th (2015)	(+)*	(+)***	(+)***	(+)***	Yes
United Kingdom	London - London Bridge (2017)	(-)***	(-)***	(-)***	(-)***	Yes
Belgium	Brussels (2014)	(+)*	(+)*			No
	Brussels (2016)	(-)**	(-)**	(-)***	(-)**	Yes
Sweden	Stockholm (2017)	(-)*	(-)*	(-)*	(-)*	Yes
					Total	**6 out of 9**

- **Table 19.** Consistency of significant 10-days cumulative abnormal returns on the MSCI World.

10-Day CAR on MSCI World	Attack	Normal Returns, 45 Days	Total Returns, 45 Days	Normal Returns, 20 Days	Total Returns, 20 Days	Consistent
United States	San Bernardino (2015)	-	(-)**	-	(-)*	No
Germany	Berlin (2016)	(-)*	(-)**	(-)***	(-)***	Yes
	Paris - Nov. 13th (2015)	(+)*	(+)*	(+)***	(+)***	Yes
	Nice (2016)	-	-	(-)***	(-)***	No
Belgium	Brussels (2014)	(+)*	(+)*	(+)**	(+)*	Yes
	Brussels (2016)	-	-	(-)*	(-)*	No
Denmark	Copenhagen (2015)	-	-	(-)**	(-)**	No
Norway	Oslo & Utoya (2011)	(-)***	(-)***	(-)***	(-)***	Yes
					Total	**4 out 8**

- **Table 20.** Consistency of significant 5-days cumulative abnormal returns on the MSCI Europe.

5-Day CAR on MSCI Europe	Attack	Normal Returns, 45 Days	Total Returns, 45 Days	Normal Returns, 20 Days	Total Returns, 20 Days	Consistent
Germany	Berlin (2016)	-	-	(-)**	(-)**	No
France	Toulouse-Montauban (2012)	(-)***	(-)***	(-)***	(-)**	Yes
Belgium	Brussels (2016)	-	(-)*	(-)*	-	No
Norway	Oslo & Utoya (2011)	-	(-)**	-	(-)***	No
					Total:	**1 out 4**

- **Table 21.** Consistency of significant 10-days cumulative abnormal returns on the MSCI Europe.

10-Day CAR on MSCI Europe	Attack	Normal Returns, 45 Days	Total Returns, 45 Days	Normal Returns, 20 Days	Total returns, 20 Days	Consistent
France	Toulouse-Montauban (2012)	(-)**	(-)**	(-)*	(-)*	Yes
	Paris - Charlie Hebdo (2015)	(+)*	(+)*	(+)**	(+)**	Yes
	Nice (2016)	-	-	(-)*	(-)*	No
Norway	Oslo & Utoya (2011)	(-)***	(-)***	(-)***	(-)***	Yes
					Total:	**3 out of 4**

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