A Literature Review for the Major

Economic Effects of Terrorism

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Introduction

      Decreased business performance and stifled economic development are among the most prominent economic links to terrorism. Recent events have elevated the issue of terrorism to the forefront of global concerns. As a result, a considerable amount of research has been conducted to flesh out these relationships and establish causality. Various studies that differ in geography and time must be analyzed to comprehend these effects fully. Business performance is the ability of a firm to achieve its objectives. Assuming that a firm's primary objectives are to make money and to grow, this paper will focus on revenues or firm expansion/contractions to quantify business performance. Economic growth is the increase in quality and quantity of production over time; it can be measured through GDP and production in specific sectors. The vast majority of this research uses data from the Global Terrorism Data (GTD), it is essential to note that the GTD defines a *terror attack* as "the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious, or social goal through fear, coercion, or intimidation".

Terrorism Leads to a Decrease in Business Performance

      According to Bayter (2021), Terror attacks in France from 1985-1997 lead to a decrease in firm earnings in the subsequent years. France was the third most affected country by terrorism in Europe in 2018 (Bayter, 2021). Bayter uses data from the GTD and exploits the inherent randomness of successful and failed terror attacks, a method previously used by Brodeur (2018). From the regressions, Bayter concludes that there is a statistically significant negative impact on local firms' revenues in the area of recent terror attacks and found that this effect lasts for three

years after the attack. Bayter uses the fact that the decrease in revenue occurs after the terror attack to establish a causal relationship between terrorism on business revenue. This revenue decrease ranges from 2% to 4% per year in the three years after the attack. It is important to note that no long-term conclusions can be drawn as Bayter notes that their findings after the three years are not robust.

Bayter specifies channels that lead to decreased business earnings from terrorist attacks. These attacks increase consumer fear and destroy existing human and physical capital (direct effects). This destruction can decrease productivity by damaging a firm's capital, such as office buildings and manufacturing equipment. This decrease in productivity results in lower firm revenues after an attack. The indirect channel of fear also reduces a firm's earnings. Bayter explains that terrorism triggers fear. Fear of victimization and increased perceived risk changes consumer behavior, which could decrease firms' revenue. In this case study of France, Bayter establishes a clear and significant causal effect between terrorism and decreasing firm revenues in France. A decrease in firm revenues translates to a decrease in business performance.

Greenbaum, Dugan, and LaFree (2007) examine the impact of terrorism on business activity in Italian provinces from 1981-1997. Business activity is the creation or expansions/contractions of firms. Greenbaum uses the GTD for terror data and the Italian National institute of social security for firm-level data. The authors find a strong correlation between provinces that experienced an attack and a decrease in the creation of new firms and firm expansions in these provinces. In addition, Greenbaum et al. find a significant effect on the loss of employment after a successful attack; this differs from the findings of Bayter (2021) and Arellano (2019).

Greenbaum et al. outline factors in Italian provinces that contribute to their findings. The majority of firms in Italy are small, and these small firms account for 70% of employment (Greenbaum et al., 2007). Smaller firms might not have the resources to combat the increasing insurance premiums, infrastructure disruptions, and frightened customers. This lack of financial resources could make them more sensitive to the economic ramifications of terrorism. Therefore, the high significance between an attack and business activity could be attributed to the size of most Italian firms since the majority are small. Therefore, making them more sensitive to the negative economic impacts of a terror attack. This theory is supported by running the same regression but only including firms with over 200 employees (less than 30% of the original data). With this regression, the resulting firm contractions from terrorism become insignificant. The significant causal link established between terrorism and decreasing provincial Italian business activity solidifies the causal relationship between terrorism and decreasing business performance and is in concurrence with Bayter's findings in France and outlines similar logic as to why terrorism has this impact. Bayter and Greenbaum et al. both emphasize the fear generated by terrorism which can alter the behavior of economic agents, leading to an aggregate decrease in business activity. However, Greenbaum et al. contribute a heterogeneous effect due to firm size to the relationship between terrorism and business activity.

Abadie and Dermisi (2008) evaluate the effect of increased perceived risk and fear caused by terrorism on central business districts' activity. These central business districts play a vital role in the US economy. Chicago is one of the US's most significant central business districts that was not directly impacted (no destruction of physical or human capital) by the 9/11 terror attack. Therefore, Abadie and Dermisi use Chicago's central business district as a case study to isolate the indirect effects of 9/11. Abadie and Dermisi focus on vacancy rates in the business district of

Chicago from 1996-2006. Their results suggest a significant increase in class A and B office buildings in Chicago after 9/11 and that this increase was more severe in buildings near landmark buildings that are considered prime targets for terrorists. This evidence suggests that the 9/11 terror attack influenced the location decisions of Chicago businesses.

Abadie and Dermisi explain that terror attacks incite fear and increase perceived risk, which alters the behavior of economic agents, similar to Bayter (2021) and Greenbaum et al. (2007). However, Abadie and Dermisi isolate the indirect effect by choosing a city that has not suffered any physical destruction from terror attacks, contrary to Bayter (2021) and Greenbaum et al. (2007). Abadie and Dermisi explain that the perceived risk of locating your business at preferred terrorist target and fear of victimization causes businesses to relocate outside of the central business districts, which are prime targets for a terror attack. This relocation negatively impacts the agglomeration economy in the business district. As the agglomeration economy dwindles, individual businesses lose the synergy of the agglomeration and thus decrease their individual performances.

Blomberg, Hess, and Weerapana (2004) use a bidirectional approach to explain the causation between terrorism and economic growth, using data across 130 countries between 1968 and 1991. The authors found that terrorism and economic activity are inexplicably linked. By analyzing business cycles, Blomberg et al. conclude that the contractions of the business cycle increased the likelihood of terrorist activities. Blomberg et al. theorize that groups with limited access to opportunity rationally resort to terrorism, while political elites rationally limit open access to these groups because of their terror activities. Thus, creating a cycle of reduced economic and business activity and increased terrorism. Blomberg et al. cycle theory indicate a bidirectional causality between business performance and terrorism, contrary to the

unidirectional causality approach of Abadie and Dermisi (2008), Bayter (2021), and (Greenbaum et al., 2007). While this theory does not entirely oppose the causal effects found in the previous papers, it does add another layer of complexity to the established relationship between business performance and terrorism.

Enders, Sandler, and Parise (1992) are some of the first to examine the impact of terrorism on tourism and lay the groundwork for Crain and Crain (2006) to follow. In the 1980s, a wave of terrorism struck internationally. Enders et al. focus on three countries and their surrounding regions, Italy, Greece, and Austria, from 1970 to 1992. These three countries are prominent tourist destinations in Europe and had highly salient terror attacks in the 1980s. Enders et al. estimate revenue losses from terror attacks using time series data and conclude that the tourism industry suffered significant revenue losses (approximately 5%) in each of the three countries after the terror attacks.

Enders et al. also find a significant generalization effect. A terrorist incident in one nation is a sufficient deterrent to tourism in neighboring nations, decreasing tourism revenues for all nations within close enough proximity. This generalization creates a compounding effect on tourism between nations, indicating a high potential loss of revenues for multiple countries due to terrorism. Ender et al. establish a significant causal relationship between a decrease in the tourism sector's performance (through loss of revenue) and a significant generalization effect in Europe.

Terrorism Leads to a Decrease in Economic Growth

Abadie and Gardeazabal (2003) use the Basque Country as a case study to determine the economic costs of terrorism, specifically the GDP per capita. The Euskadi Ta Askatasuna (ETA) is a Basque separatist and domestic terrorist group formed in 1959. The ETA has specifically

targeted Basque businesses and corporations. Before the 1970s, the Basque Country was among the richest in the region and was third in GDP per capita. However, by the end of the 1990s, it dropped to sixth in GDP per capita—a clear negative economic shift. Abadie and Gardeazabal are the first to analyze how spikes in ETA terror attacks affected the GDP per capita between the 1970s and 1999 and solidify the causal effect of the terror attacks on Basque growth. Abadie and Gardeazabal use other Spanish regions to create a "synthetic" control region to use as a terrorism-free counterfactual to compare the reality of the Basque Country. This approach starkly contrasts the cross-sectional country view that Greenbaum et al. (2007) use for Italian provinces. The authors conclude that after the onset of terrorism, the Basque Country's GDP per capita declined by 10 percent compared to the control region. Moreover, this GDP per capita gap widens in response to terrorism after a time lag. Abadie and Gardeazabal use this time lag to establish the causality of terrorism on GDP per capita. Additionally, the authors compare the real GDP per capita between the synthetic (terror-free control) to the real Basque Country (with terrorism) and reveal that the Real Basque country consistently has a lower GDP per capita from 1970 to 1999 than the terror-free synthetic. This consistently lower GDP shows that terrorism stifled economic growth in the Basque Country.

Arellano (2019) investigates the effect of terrorism on rice production in the Philippines. She uses provincial-level data similar to the approach Greenbaum et al. (2007) used in the case study of Italy. Arellano focuses her analysis from 2008-2017 and concludes that every additional terror attack corresponds to a 1 percent decrease in rice production growth. Additionally, the number of fatalities resulting from the terror attack is not significantly correlated to rice production.

Arellano explains that a significant channel affecting this decrease in output is the disruption in households and businesses that terrorism causes by inducing fear and uncertainty, a conceptual framework supported by all previous papers. Rice is one of the leading agricultural products of the Philippines and is the second most weighted product in the CPI (Arellano, 2019). Investigating a major economic commodity, such as rice, emphasizes the detrimental impact that terrorism can create. As output in critical economic sectors falls, GDP and growth could decrease if terrorism continues to plague the nation.

Crain and Crain (2006) estimate the macroeconomic effects of terrorism, specifically GDP and GDP growth. Crain and Crain use panel data including over 147 countries from 1968 to 2002. Crain and Crain examine the negative impacts terrorism has on the aggregate production function; they focus on output levels rather than growth rates, as Abadie and Gardeazabal (2003). However, the authors analyze GDP with time series data and make short-term conclusions about the trend of GDP. Over 5-year averages, a clear negative relationship exists between GDP per capita and the number of terrorist attacks (Crain & Crain, 2006). The decreasing aggregate output levels could indicate decreasing economic growth in the short-term following a terror attack.

Crain and Crain take their analysis one step deeper than Abadie and Gardeazabal (2003) and examine how the number of terror attacks affects some of the components of GDP, specifically consumption, capital investment, and the tourism sector. Crain and Crain theorized that terror attacks would reduce capital investment because of increased uncertainty of returns. Their results were significant at the five percent confidence level, indicating a decrease in investment as the number of unanticipated terror attacks increased. This result is mimicked in the consumption expenditure regressions. As terror attacks increase, consumption expenditures

decrease. These findings indicate that a decrease in investment and consumption contributes to the decrease in GDP. Tourism is thought to be a highly sensitive sector to terrorism (Enders, Sandler, and Parise, 1992), (Bayter, 2021), (Greenbaum et al., 2007). Crain and Crain found that internationally across 147 countries, the number of terror attacks had a substantially negative impact on tourism expenditures, corroborating the country-specific case study literature.

Blomberg, Hess, and Orphanides (2004) also examine macroeconomic consequences across countries like Crain and Crain (2006). Blomberg et al. examine 177 countries annually from 1968 to 2000. Their results suggest a significant negative effect on growth supporting existing literature. However, Blomberg et al. also find a heterogenous effect of terrorism based on a country's development. Terrorism has a more significant effect on growth if the nation is less developed. This finding could correlate to Arellano's (2019) finding in the Philippines. Due to the Philippines being a developing nation, it could be more sensitive to a terror attack, which is why Arellano (2008) found such a large decrease in a primary agricultural product. The findings of Blomberg et al. support the existing literature by establishing a negative causal relationship between terrorism and economic growth and contribute to the field by another layer of complexity to the relationship, heterogeneity based on the country's development before terrorism.

Gaibulloev and Sandler (2008) investigate growth consequences in Western Europe using panel data including 18 countries from that region between 1971 to 2004. While Gaibulloev and Sandler find an aggregate negative impact of terrorism on income per capita growth, supporting the other literature, they go further by disaggregating terrorism into two categories domestic and transnational. Transnational terrorism is a terror attack where the perpetrator and the victims are of different nationalities. Domestic terrorism is when the perpetrator and the victim are of the

same nationality. Gaibulloev and Sandler find that the negative effect on growth is higher for transnational terrorism than it is for domestic. While the negative per capita growth effect Gaibulloev and Sandler found was significantly negative, they noted that it was not large enough to devastate the economy because the Western European economies were developed and robust enough to withstand the consequences. Further support for the heterogeneity of the effect of terrorism on growth was found by Blomberg, Hess, and Orphanides (2004).

The following year Gaibulloev and Sandler (2009) looked at the growth consequences of terrorism again, but this time in Asia between 1974 and 2004. To estimate the effect of terrorism, Gaibulloev and Sandler add terrorism as a variable in the standard growth model. In this paper, Gaibulloev and Sandler focus only on transnational terrorism, since in the previous paper, Gaibulloev and Sandler (2008) conclude that transnational terrorism had a much larger effect on growth than domestic terrorism. Asia has more diversity in the development level of its economy, so, Gaibulloev and Sandler found a substantial distinction in the effect of transnational terrorism between levels of development in the economies. Gaibulloev and Sandler found that in the short-run transnational terrorism had a severe growth-retarding effect in developing countries in Asia. However, in the developed countries of Asia, this effect seems minimal.

Gaibulloev and Sandler's (2009) conceptual framework emphasizes the augmentation of spending. They cite the dramatic increases in government spending on counterterrorism as crowding out the private investment sector. The crowding out effect has a significant growth effect because the private sector investments would increase production capabilities, like human and physical capital. Government spending curtails this investment and puts resources towards less productive security and counter-terrorism sectors. Gaibulloev and Sandler (2009) reinforce and further support their finding previous finding (Gaibulloev & Sandler, 2008) that

transnational terrorism has a more severe impact on economic growth than domestic terrorism. The difference in growth effects between developed and undeveloped countries in Asia is further evidence of the heterogeneity effect of Blomberg, Hess, and Orphanides (2004).

Pakistan joined the global war on terrorism in the wake of 9/11, sending security forces into the highly targeted areas, primarily the Federally Administered Tribal Areas (FATA) and the North-West Frontier Province (NWFP). These forces displaced over three million people (Ali, 2010). These displaced persons rely heavily on the government's fiscal resources, increasing the budget deficit and hindering economic development. Pakistan takes the brunt of the blame for terrorism from other countries, most notably the United States. It is essential to recognize that Pakistan is as much a victim of terrorism as other nations.

Ali (2010) studies the economic costs of terrorism in Pakistan from 2004 to 2009. Ali does an in-depth analysis of Pakistan by isolating the effects of terrorism in vital economic sectors of Pakistan, such as manufacturing and agriculture. This approach is unique for a case study and allows Ali to analyze the Pakistani economy at a deeper level than others. To quantify the effects of terrorism, Ali uses contribution to GDP growth (percentage points).

According to Ali, agriculture is the primary source of revenue in the highest terrorism-affected areas (FATA and NWFP). The agricultural sector faces the direct costs of terrorism; due to the targeting, these places have faced heavy destruction of their farming land (physical capital) and land seizure due to the security forces. The Economic Survey of Pakistan supports this by showing that the agricultural share of GDP has been consistently falling since the onset of the attacks.

The manufacturing sector experienced its lowest growth rate in over a decade in the two years following the onset of the attacks. According to Ali, large manufacturing plants are

frequent targets of terror attacks, creating fear in the workplace. This fear makes the workers less productive and discourages manufacturers from expanding. Ali's analysis of key sectors of the Pakistani economy shows how the direct and indirect costs of terrorism can compound to impact a country's growth negatively.

Conclusion

The causal effects of terrorism are complex and multifaceted, as the literature suggests. Terrorism data is noisy. However, examining a diverse subset of the literature shows that business performance and economic growth suffer due to terrorism. Although much of the literature agrees on that fundamental relationship, newer studies contribute by examining the nuances and complexities of this established relationship, like the generalization effect and the heterogeneity effect. Further studies are warranted to flesh out the fundamental relationship and unravel its complexity to understand the true effect of terrorism better and adjust public policy accordingly to minimize the negative impacts of terrorism.

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