Terrorism as a Risk Factor for Genocide

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Thesis

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1 Introduction

Regardless of the cynical undertones, violent conflict is a very real aspect of human existence. One only has to flip open a newspaper or turn on the television to see that the media proves the pervasive and potent nature of violent conflict. From the latest bombing in the Middle East, to another victim of homicidal gun violence in America, no country escapes the effects of violent conflict. From a statistical lens, more than 1.6 million people die each year due to violence. Violence is also among the leading causes for deaths in people ages 15-44, accounting for a staggering 14% of male and 7% of female deaths (World Health Organization, 2002). To provide a better sense of scale, and avoid the trappings of unrelatable statistics, the number of people who die each year to violence is roughly equivalent to the entire population of Philadelphia, PA (US Census, 2015) or the entire borough of Manhattan, NY (NYC Department of City Planning 2015). Due to the severity and seriousness of this topic, many professionals from the fields of history, political science, psychology, sociology, and even economics have attempted to understand, resolve, and prevent acts of violence.

This study attempts to contribute to this significant field through the specific lens of conflict economics. For some who may be unaware, the field of conflict economics is a relatively small sector of applied economics that, according to Anderton & Carter (2009), has two defining characteristics. On a conceptual level, the established concepts, models, principles, and methods of economics can be applied to understand and analyze the nature of all forms of conflict activity. But it is also able to extend the reach of economics by restructuring the core foundations of economics to include appropriation – something that is traditionally ignored in mainstream economics – as a legitimate method of acquiring wealth and utility.

Using conflict economics as a foundation, this study aims to answer the following question: "Is it possible to improve the analysis of risk factors for genocide in empirical studies by incorporating terrorism as a potential risk factor?" In essence, this question is probing the nature of risk factors for genocide onset and asking whether levels of terrorism could be a "red flag" for future genocide alongside other more recognizable risk factors.

My thesis will strongly contribute to this area of genocide research in an effort to help better understand the nature of genocide onset. While a limited number of studies have explored some aspect of genocide onset (Armstrong & Davenport, 2008; Goldsmith, et. al., 2013; Harff, 2003; Colaresi & Carey, 2008; Rost, 2013; Anderton & Carter, 2015), my study will be the first of its kind to examine terrorism as a risk factor for genocide onset. In previous studies, terrorism has been included as one component in a multiple-component index designed to measure state instability, but otherwise ignored.

I hypothesize that I will find significant results for the relation of terrorism to genocide onset, suggesting that a certain degree of terrorism can act as a risk factor for future genocide. In an effort to further my findings, I will extract and isolate different aspects of terrorism in an attempt to determine what, if any, specific facets of terrorism carry a heavier significance. After all, many logical questions can follow from this study's main question: Could different terrorism target types be a more significant indicator for genocide than others? Could the severity of terrorism-related deaths be significant? Could the acceleration of terrorism attacks be significant?

Being able to understand what risk factors can lead to the onset of genocide has significant repercussions on humanitarian organizations, international policy, and the general well-being of countries' civilians. After all, genocides have severe consequences. As an

extreme category of violent conflict, death tolls can reach depressingly high levels. Notable cases include the 1994 Rwanda genocide that resulted in 750,000 fatalities and the 1975-1979 Cambodian genocide that claimed over 2,700,000 lives (Harff, 2003). Since terminating genocide once it has begun has proven over the course of history to be a very challenging endeavor, finding methods to predict and prevent its onset is the most fruitful area for policy intervention and for additional research.

2 Background Literature

2.1 *Development of Conflict Economics*

In the field of economics, special attention has been placed on theoretically and empirically understanding core aspects of large-scale violence such as civil wars, terrorism, interstate conflicts, and genocide. When it comes to genocide, however, the literature is thin and underdeveloped. As Anderton and Carter (2015) point out, there are less than three dozen published articles on genocide that study risk factors with a large enough sample to be considered viable. And that is in comparison to the well over 500 and 100 similar studies conducted for interstate violence and both civil war and terrorism, respectively. The great disparity in these numbers foreshadows another issue that has hampered the development of genocide research: studies of isolated conflict types.

Indeed, for a majority of the lifespan of conflict economic research, there seems to have been a severe lack of research that deals with the interconnected nature of violent conflicts. As political science scholars Findley and Young (2012) noticed, scholars of the past have, whether implicitly or explicitly, explored the nature of one form of violent conflict without acknowledging the relation it has with others. This gave rise to a plethora of isolated

studies of riots (Horowitz, 2003), repression (Poe & Tate, 1994), terrorism (Abrahms, 2006), protests (McAdam & Su, 2002), and genocides and massacres (Valentino, 2000). But rationally, this does not make sense. Conflict types are often interconnected, which more recent and forward thinking scholars have begun to develop. This includes Findley & Young (2012, 2013), who have connected, both theoretically and empirically, terrorism and civil war; and Anderton (2016), who explores correlations between wars and mass atrocities across several conflict datasets. My study exists in this newly developed space, where the interconnectivity of genocide and terrorism can finally be empirically assessed and understood.

2.2 *Relevant Literature on Genocide*

As stated above, my study will be the first of its kind to explore the significance of terrorism as a risk factor for the onset of genocide. But can such a relatively low-level of violence like terrorism really be significant to the development of a future high-level occurrence of genocide? Anderton & Ryan (2016) provide a basis for which we can rationally answer yes to the above question. One of the most prominent results of their study is the confirmation of what they call 'habituation to atrocity' – the notion that previous civilian killings can create additional demand for future civilian killings. Following the vein of rational addiction literature, they are able to show empirically that low-level violence can be a predictor of high-level violence later on, a notion that taps into the core foundation of my study's question.

Harff's (2003) study uses a case control method that limits her data to the 126 countries that experienced state failure sometime between 1955 and 1997. Although her study

does an excellent job at clarifying six key risk factors for genocide—magnitude of political upheaval, history of prior genocide, low trade openness, ethnic minority elite, autocratic regime, exclusionary ideology of elite—her study is limited by her sample. I, on the other hand, go beyond Harff's sample and include countries with and without civil war as represented by my Mag variable. This controls for the degree of civil war, including zero civil war, and treats the degree of severity of a civil war as a risk factor for genocide.

Anderton & Carter (2015) provide a useful summary of key studies relating to genocide, mass killings, and civilian atrocities. Not only was this useful in locating sources, but they also suggested a new variable that genocide research should take into account: new state status. I will be controlling for this in my study, as they show empirically that it is a significant risk factor for genocide. They also pose and correct for a serious problem that genocide studies can face when using the Polity dataset on states' political systems. Specifically, there are components of a state's Polity score for political system in which that include degrees of factional violence. Such Polity components can, unfortunately, include genocide. Hence, to avoid having genocide elements in both my left- and right-side variable measures, I will follow Vreeland (2008), to decontaminate my Polity data of genocide elements before using it in my study.

3 Data

3.1 *Sample and Variables*

To test my hypothesis and answer my study's question, I have collected relevant data on genocide (Political Instability Task Force (PITF) geno/politicide dataset), terrorism (Global Terrorism Database), and all necessary control factors (World Bank, Armed Conflict

and Intervention Polity IV dataset) for the years 1960 to 2015. Informed by the logic of Harff (2003), Colaresi & Carey (2008), and Rost (2013), I will use Logit based regression analysis since my left side variable will be Genocide_Onset coded 1 if yes and 0 if no. The main right side variable will include my unique inclusion of the number of terrorism incidents for a state per year, while the rest will be typical control variables one would find in genocide risk factor analysis. All right side variables will be lagged one year except for my measure of ethnic fractionalization, which is time-invariant. In order to avoid complications between genocide onset and ongoing (multiple year) genocides and because my study focuses on the *onset* of genocide, I have also dropped any observations where Genocide_Incidence=1 but Genocide_Onset=0.

My current baseline Logit regression model features the core variables that make up my study. Although more variables will be added in later on to explore the finer details of my study (such as exploring the significance of the target or attack type of terrorist attacks), my model is as follows:

$$GenocideOnset_{1,0}$$

$$= \beta_0 + \beta_1(\#TerroristIncidents\_Lag) + \beta_2(Population\_Lag)$$

$$+ \beta_3(Fraction\_Alesina) + \beta_4(GDP/Capita\_Lag) + \beta_5(Polity2_{Lag})$$

$$+ \beta_6(MagVariable\_Lag) + \beta_7(TradeofGDP_{Lag}) + error$$

Genocide Onset: The dependent variable for this study is genocide onset, coded 1 if an onset occurs and 0 if not. This data is collected from the Political Instability Task Force's geno-politicide dataset, ranging from 1955 to 2015. It includes both genocides and politicides

without distinguishing between the two, therefore clumping both together in my study's definition of genocide.

Terrorist Attacks: For my terrorism data, I collected the number of terrorist incidents per year per country for all countries available in the Global Terrorism Database. The GTD defines terrorism 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" (GTD Codebook). My study includes all data points available in the GTD under this definition lagged one year. Although the GTD allows for events to be filtered out based on three main criteria that can improve the accuracy of my results and potentially prevent results that attribute too many events as terrorism, this is an area for later refinement.

Polity 2: The polity dataset is one of the most well-known datasets for conflict economics, used by both political scientists and economists. Polity 2 ranks countries on a scale from -10 to 10 in accordance to their level of democracy. A -10 is a pure autocracy, a 10 is a democracy, and 0 is an in between political system called anocracy. This control variable helps to account for the fact that the more democratic a country is the less likely it will experience any internal or external violence. In a similar manner to other control variables, this variable is lagged one year in my regression.

Mag Variables: This category includes MagFight, MagArea, and MagFatal. Each of these variables attempts to quantify instability on a scale designed to capture the intensity of an internal revolution or ethnic war on a five-point scale. These variables are sourced from the Armed Conflict and Intervention datasets available through The Integrated Network for Societal Conflict Research. MagFight details the number of rebel combatants or activists, MagFatal looks at annual number of fatalities due to fighting, and MagArea examines the

portion of a country that is affected by fighting. All three variables can be useful in constructing a control variable for the instability level of conflict of a country. The Mag variables are split across two datasets, one examining revolutionary wars and the other ethnic wars. When creating my Mag variables, I took the highest magnitude available if a country was experiencing a revolutionary and ethnic war at the same time. In cases of no ethnic or revolutionary war present, the country-year is coded as zero.

GDP: Using Gross Domestic Product as a control variable is standard practice in genocide literature. Similar to other control variables it is lagged one year and is sourced from the World Bank's World Development Indicators dataset. My empirical research uses real GDP with 2010 as the base year.

Population: Population is a standard control variable for conflict economic studies focusing on genocide. Here, my population numbers are taken from the World Bank's World Development Indicators dataset which ranges from 1960 to 2015 and has population defined as a raw total. My study lags population by one year.

Trade: To account for trade, something that has often included in conflict risk studies to test the hypothesis that high trade would deter internal and external conflicts, I use a trade as a percentage of GDP for each country year courtesy of the World Bank's World Development Indicators. Similar to other variables, it is also lagged one year.

Alesina Fractionalization: In order to account for ethnic heterogeneity and its potential effect on genocide onset, I use a time invariant fractionalization control variable provided in Alesina et. al. (2003).

My initial descriptive statistics are as follows:

TABLE 1: Descriptive Statistics

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Genoide onset	8380	0.0048926	0.06978	0	1
# of terrorist attacks	9557	15.1738	96.5918	0	3925
Polity 2	7811	0.9066701	7.437533	-10	10
MagFight	10499	0.2852653	0.9182964	0	4
MagFatal	10502	0.1585412	0.5679291	0	4
MagArea	10515	0.2222539	0.7572861	0	4
Fractionalization Alesina	8153	0.4483729	0.2579864	0	0.899761
GDP per capita	7665	9906.704	15215.26	115.4357	145221.2
Population	10064	2.66E+07	1.05E+08	4433	1.37E+09
% Trade of GDP	7440	76.78975	49.25766	0.0209992	531.7374

Although my data collection process included over 40 variables, the ones included above are the only ones relevant to my initial regressions. As one can see, there are 10,518 country-year data points in my sample, which ranges from 1960-2015.

4 Empirical Results

My study, similar to all studies focused on genocide, faces a very real problem: a small n value due to a lack of many genocide onsets in the world. That is a great thing in general, but a challenging obstacle to overcome when trying to achieve strong and robust empirical results. To prevent as many issues as possible, I have analyzed my data using a logit regression that relaxes the typical strictness for independent observations and specifies that the standard error allows for intragroup correlation. In other words, I have used a vce(cluster State_Code) command to clearly state that observations are independent across groups but not necessarily within groups. This approach does not affect the estimated coefficients but does affect the variance and standard errors.

On the next page, a table summarize three main regressions. The key difference between these regressions is the magnitude variable, which is either MagFight, MagFatal, or MagArea. By running the same regression and changing this variable, this acts as a robustness

check and validates the significance of my results. As seen, the number of terrorist attacks is significant across all three regressions at the 95% level with a sign that suggests an increase in terrorist attacks increases the risk of genocide. This alone makes my results very promising and seems to confirm my original hypothesis that there is a positive correlation between terrorism and genocide onset, controlling for other factors. In more relatable terms, a one unit increase in number of terrorist attacks leads to a .0015 unit increase in genocide risk. This result certainly seems small, but it is significant and confirms a connection between genocide onset and terrorism.

TABLE 2. Initial Logit Model of Genocide Onset

	(1) Initial Model (MagFight) (Robust Std. Error) [P-Value]	(2) Initial Model (MagFatal) (Robust Std. Error) [P-Value]	(3) Initial Model (MagArea) (Robust Std. Error) [P-Value]
# of Terrorist Attacks	*0.0015478 0.0005589 [0.006]	*0.0016764 0.0005032 [.001]	*0.0017251 0.0005362 [.001]
Polity 2	**-0.0600198 0.0349815 [0.086]	**-0.0574164 0.0345501 [.097]	**-0.0576283 0.03389 [.089]
MagFight	*0.3871328 0.1728062 [.025]		
MagFatal		**0.4885763 0.2765256 [.077]	
MagArea			*0.3678264 0.1502387 [.014]
GDP Per Capita	*-0.0001462 0.0000639 [.022]	*-0.0001557 0.0000684 [.023]	*-0.0001512 0.0000636 [.017]
Population	-1.29E-09 1.21E-09 [.284]	-1.23E-09 9.39E-10 [.190]	-9.29E-10 9.09E-10 [.307]
% Trade of GDP	*-0.0280328 0.0137657 [.042]	*-0.0298656 0.0135078 [.027]	*-0.0291547 0.0136666 [.033]
Fractionalization Alesina	-1.204348 0.9046866 [.183]	-1.242568 0.9011815 [.168]	-1.20968 0.9115268 [.184]
Constant	*-3.349475 1.041301 [.001]	*-3.12465 1.013425 [.002]	*-3.21973 0.9822019 [.001]
Pseudo R2	0.1673	0.1602	0.1609
Log Likelihood	-120.83753	-121.90034	-121.80779
N	5936	5946	5949
Countries	151	151	151

Notes: Results are products of logit regression with cluster-robust standard errors and all lagged right side variables except Fractionalization_Alesina, which is time invarient. *p≤0.05, **p≤0.10

Beyond the terrorism variable, the coefficients and p values for my control variables are exactly what one would normally expect in an empirical analysis of genocide onset risk. Looking specifically at the MagFight variable, one can notice that a one unit increase in MagFight leads to a .38 unit increase in genocide risk. Clearly, a county's instability is more significant an indicator that number of terrorist attacks. But, the MagFight variable did not crowd out the significance of the number of terrorist events, suggesting that my terrorism variable is capturing something precisely about terrorism that goes beyond civil unrest.

To get a better sense of magnitude and how significant my results are on the margin, average elasticity results are shown next to my regression on the next page. The results again suggest that the magnitude of the effect of terrorism on genocide risk is relatively small. Specifically, column 2 of Table 3 suggests that a one percent increase in the number of terrorist attacks would correlate to a 0.03 percent increase in the risk of genocide onset. This is indeed a small magnitude, but it is not wildly smaller than the Polity 2 and MagFight elasticities of -0.12 and 0.12, respectively. Furthermore, my research has not yet taken into account whether different types of terrorist attacks (e.g., attacks against civilians, attacks against government targets) might be driving the consistently positive and significant effect of terrorism on genocide onset risk.

TABLE 3: Magnitude Model with Elasticity

	(1) Initial Model (MagFight) (Robust Std. Error) [P-Value]	(2) Average Elasticity (Robust Std. Error) [P-Value]
# of Terrorist Attacks	*0.0015478 0.0005589 [0.006]	*0.0269029 0.0091537 [.003]
Polity 2	**-0.0600198 0.0349815 [0.086]	**-0.1241851 0.0725438 [.087]
MagFight	*0.3871328 0.1728062 [.025]	*0.1220225 0.0539452 [.024]
GDP Per Capita	*-0.0001462 0.0000639 [.022]	*-1.419211 0.6200196 [.022]
Population	-1.29E-09 1.21E-09 [.284]	-0.0475274 0.0445162 [.286]
% Trade of GDP	*-0.0280328 0.0137657 [.042]	*-2.059169 1.011788 [.042]
Fractionalization Alesi	-1.204348 0.9046866 [.183]	-0.5446591 0.4093717 [.183]

Notes: Results are products of logit regression with cluster-robust standard errors and all lagged right side variables except Fractionalization_Alesina, which is time invarient. *p≤0.05, **p≤0.10

5 Future Directions and Concluding Thoughts

Going forward, there is a lot of potential to improve and refine my thesis. As mentioned earlier, I would like to collect more data and run regressions that break up the number of terrorist attacks into target and attack types. Perhaps that will show that certain target and/or attack types play a more significant role in increasing genocide risk. Rationally, certain acts of terrorism might increase the general sense of instability in a country or initiate a mental shift where people begin to become habituated to atrocity and subsequently become more open to higher level of attacks leading to genocide. Furthermore, a better approach to understanding the magnitude of my results might be useful as well as including other control variables to my original regression to observe how the results are effected. I also plan to undertake several additional robustness checks, including estimating my empirical model with rare events logit, which is quite pertinent given the rarity of genocide onset in my sample.

Whatever these future analyses turn out to be, I can confidently claim that there is a small but significant connection between the number of terrorist incidents and the risk for a future genocide. My work has been designed to contribute to the testing of conflict risk hypotheses in a manner in which multiple forms of conflict are considered in the study. I believe my study is the only one so far that assesses the risk properties of both civil conflict magnitude *and* terrorism in a risk factor analysis of genocide onset.

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