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Adeline M. O'Donnell April 10, 2017

An Empirical Investigation into the Impact of International Trade on Terrorism

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An abstract of
a thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
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Bachelor of Arts with Honors

Department of Economics

2017

Abstract

An Empirical Investigation into the Impact of International Trade on Terrorism

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This paper uses a fixed effect negative binomial model to examine the impact of international trade on terrorism and finds that total trade is negatively related to all measures of the number of terrorist events. This paper compares the impact of trade on domestic and transitional terrorism and concludes that trade has a greater impact on domestic terrorism than transitional terrorism; however total trade is connected to both forms of terrorism. This paper further investigates the impact of various exports and concludes that not all types of trade are negatively related to terrorism. This paper also studies the lagged effect of trade and finds that trade does have a lag effect on terrorism, which is positive and changes over time. Finally, this paper investigates a number of social and political controls and finds evidence to support that the level of democracy and natural resource dependency within in a country potentially interacts with trade's impact on terrorism.

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I. INTRODUCTION

Since 1970, the number of documented terrorist events has been increasing; in 1970 there were 650 documented events and that number has jumped to 14,782 events in 2015.[1] Terrorism causes not only the loss of innocent lives, but it also has negative economic consequences, particularly for tourism, insurance, and financial industries.[2] During the same time-period while terrorist incidents have been increasing, international trade has also been growing. In 1970, trade accounted for 26.95% of world GDP, and it has increased to 58.32% in 2015.[3] International trade impacts jobs, wages, and GDP all of which can alter the opportunity costs of terrorism. Some politicians have publically advocated for the use of specific trade policies to combat terrorism, citing its ability to increase GDP and reduce economic deprivation,[4] but there is a lack of research on trade's impact on terrorism to support these policies.

In the broadest sense, this paper will investigate the impact of international trade on terrorism. More specifically, this paper will look at how trade impacts various types of terrorism, specifically domestic and transnational terrorism. Furthermore, this paper will compare how different exports impact terrorism. This paper will also study how different political and economic systems interact with trade's impact on terrorism. Finally, this paper will examine the delayed effects of trade.

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[1] Figures calculated based on totals in the *Global Terrorism Database,* See *Appendix Graph 1* for graph of total number of terrorist incidents from 1970 to 2015.

[2] 9/11 is one terrorist incident that illustrates the negative economic consequences of terrorism. Becker and Murphy (2001) found the long-run effect of the September 11th attacks to reduce 0.3 percent of US GDP. Bram et. al (2002) found that the direct cost to NYC was around $33 billion.

[3] Estimates come from the World Bank. See *Appendix Graph 2* for a graph of total trade between 1970 to 2015.

[4] White House press release from George W. Bush: "We will actively work to bring the hope of democracy, development, free markets, and free trade to every corner of the world. The events of September 11, 2001, taught us that weak states, like Afghanistan, can pose as great a danger to our national interests as strong states. Poverty does not poor people into terrorist and murders. Yet poverty, weak institutions, and corruption make weak states vulnerable to terrorist networks" (referenced in Lindsey 2003 pg. 2)

This paper finds that total trade is generally negatively related to all types of terrorism; however, this paper finds that trade's effect on terrorism depends heavily on both the type of terrorism and type of trade. This paper find that trade is generally more related to domestic terrorism than transnational terrorism. This paper also finds that not all types of trade have the same relationship with terrorism. Manufacturing and agricultural exports were found to be positively related to terrorism, while food and ores and metal exports were found to be negatively related to terrorism. Furthermore, not all trade was found to be related to terrorism; fuel exports were found to be unrelated to terrorism, which suggests that not all trade had an impact on terrorism.

From an economic point of view, terrorists are rational actors who consider the opportunity costs of their actions to maximize their utilities. This understanding of terrorism might seem strange because it contradicts the narrative in the media that all terrorists are religious fanatics; however, many authors view terrorists from this rationalist perspective. [5] Terrorist can use terrorism for political expression or as a bargaining tool. An important question to consider is why terrorism would be used in comparison to alternative forms of political expression, and theories suggest that terrorism is chosen depending on the terrorist's goal, opportunity costs, and level of democracy within the country.[6] For instance, if the objective was to take over the country, revolution or insurgency would more likely be chosen than terrorism. But if the goal was to influence policy, then terrorism is more likely to be the chosen as opposed to revolution.

[5] Bird, Blomberg and Hess (2008) find evidence to support that economic and political factors play an important role in the determinants of terrorism; however, they do not rule out the possibility that religion could play a role (p.261)
[6] Blomberg et. Al (2004c)

International trade creates both "losers" and "winners" within the country's economy, which then can impact the opportunity costs of terrorism.[7] [8] Often times, the "losers" from international trade suffer disproportionately to the "winners", and these losers are likely to express their dissatisfaction with trade.[9] [10] The form of political expression the "losers" will use depends on their circumstances, but "losers" who are displaced workers without other options for employment might be more vulnerable for recruitment by terrorist organizations, independently seek out terrorist groups, or express their dissatisfaction on their own. Alternatively, the "winners" benefit from trade, which increases their opportunity cost for terrorism. So, the net impact of trade on the opportunity costs terrorism is somewhat ambiguous. Overtime, as an economy makes structural adjustments to trade, the society as a whole is likely to be better off, thus decreasing the likelihood that political action, including terrorism, might be taken as a response to trade.

As suggested by the ambiguity in the theoretical discussion on how trade might impact the opportunity costs of terrorism, past findings on the relationship between international trade do not indicate a definitive conclusion. Kurrild-Klitgaard et. al (2006) found that a country's total trade is both significant and negative related to terrorism, but Li and Schuab (2004) found that trade does not have a positive impact on terrorism. Blomberg and Hess (2005) focus on trade's impact on transnational terrorism, which assumes that displaced individuals would express their

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[7] "Modernization may create winners and losers and also equip those losers with the means of committing terrorist attacks in a cost-effective way" (Bird Blomberg and Hess 2008 p.259)

[8] "Openness might affect … the financial and human resources of terrorist organizations or the cost-benefit structure of undertaking terrorist attacks" (Mirza and Verider 2008 p.180)

[9] "Those who lose may lose a great deal and are likely to remember who is at fault when the next election nears. The gains are delayed, perhaps significantly, and are spread out over so many that, on average, those who do gain probably gain much less than the few who lose" (Davidson and Matusz 2001 p.29).

[10] A recent example of Davidson and Matusz's theory voters disenfranchised by trade policy that adversely impacts them was when both Obama and Clinton campaigning against NAFTA in the 2008 election to appeal to Ohio voters who blamed NAFTA for the loss of jobs within their state (McLaren, International Trade, "Preferential Trade Agreements: Background and Key Principles" p.265)

discontented about trade in foreign countries. Looking specifically at the relationship between increases in trade and transnational terrorism, both Bird, Blomberg, and Hess (2008) and Mirza and Verider (2008) found that wealthier and more democratic countries tend to experience more transnational terrorism along-side increases in trade. Although these papers touch on certain aspects of the relationship between trade and terrorism, they consider trade as simply the summing of exports and imports, many use blunt measures of trade, looking at only the sum of exports and imports, and others neglect trade's potential impact on domestic terrorism.

In response to the need for more research on the impact of trade on terrorism, this paper will add to the preexisting literature in the following ways: first, unlike the majority of papers that primarily study the impact of trade on transnational terrorism, this paper will include multiple measures of terrorism, comparing how trade impacts domestic and transnational terrorism. Second, instead of studying trade by evaluating a country's level of exports and imports, this paper will analyze how various types of exports, specifically agriculture, fuel, food, manufacturing, ores & metals impact terrorism. Third, this paper will evaluate how various economic and political systems, beyond just democracy, alter the impact that trade has on terrorism. Finally, unlike previous papers that have focused on just the net level of international trade, this paper will examine the impact of the lag effect of trade and different exports.

II. THEORY

A) Measures of Terrorism

As further discussed in the methods section, this paper will primarily use four measures of terrorism examining both transnational and domestic terrorism. Most of the previous literature has focused on trade's impact on transnational terrorism, but less have considered the impact of

trade on domestic terrorism.[11] Trade is international in nature, which makes it important to consider its impact on both domestic and transnational terrorism. Blomberg and Hess (2005) argued that trade is likely to impact both types of terrorism referencing an example of a displaced worker in an import competing industry expressing their discontent against their country's foreign trading partner.[12] Evaluating trade's impact on various measures of terrorism will allow for a greater understanding of how trade impacts terrorism.

B) Types of Exports

Different exports might have various impacts on terrorism. Some exports might help catalyze growth within an economy, while other types of exports might hold an economy in a state of underdevelopment. These exports might decrease the opportunity cost of terrorism and increase the likelihood of terrorist incidents. The impact of different baskets of exports has been studied by Hausmann et. Al (2005), and they found that a country's basked of exports influences how that country specializes, which then impacts the effect of globalization on the country.[13] Hausmann argues that a high quality basket of exports will help the country advance in its development while a low quality basket of exports can perpetuate underdevelopment. Another author, Fandl (2003), argues that one export in particular, oil, has a particularly strong effect on terror because it is both unpredictable and destabilizes the economy by negatively impacting jobs

[11] Kis-Katos and Liebert (2011) highlight the lack of research on domestic terrorism. Of the 22 studies that they surveyed, only six included domestic terrorism. And in many of the papers that did include domestic terrorism, it was not the primarily focus (p.S18).

[12] "Suppose increased economic integration has the consequences of harming individuals in import competing industries. Further, suppose these individuals join forces with terrorist organizations and express their displeasure through a terrorist attack on its trading partner. This attack on the host country from a neighboring source country will not not be appropriately taken into account [by only studying domestic terror]" (Blomberg and Hess (2005) p.3)

[13] "What we have shown in this paper is that there are economically meaningful differences in the specialization patterns of otherwise similar countries. We have captured these differences by developing an index that measures the 'quality' of countries' export basket. We provided evidence that shows that countries that latch on to a set of goods that are placed higher on this quality spectrum tend to perform better. The clear implication is that gains from globalization depend on the ability of countries to appropriately position themselves along the spectrum" (Hausmann et. al. 2005 p.15)

and making it dependent on one export.[14] These theories on the different effects of exports offer broader implications about how trade might impact terrorism. The first, is that not all trade has the same effect, and exports in particular might differ in their impact on terrorism. Following from that idea, exports that prevent an economy from developing might differ in their effect from exports that advance a country's development. exports that have a greater impact on jobs might also have a greater impact on terrorism. Finally, if an economy is heavily dependent on one export, it might destabilize the economy and increase the likelihood of terrorism.

C) Economic and Political Systems

Various economic and political systems within a country might alter how international trade impacts terrorism. Specifically, this paper will consider four different economic and political systems, which are the level of democracy, economic opportunity, education, and natural resource dependency within a country.

1. Democracy

Countries with different levels of democracy are likely to have more alternative forms of political expression available, which might impact the opportunity cost of terrorism. In a more democratic country, potential terrorist might be more likely to express their discontent through voting. Alternatively, terrorism might be more likely in an autocratic regime where voting is not an option. However, not everyone agrees that democracies are less likely to experience terrorism. An opposing theory is that democracies tend to be richer, which increases the potential for rent seeking by terrorists. Alternatively, authoritarian countries might have stricter regulations, preventing potential terrorists from carrying out attacks. No clear consensus exists within the literature on the relationship between democracy and terrorism. Kurrild-Klitgaard et. al. (2006)

[14] "Those who could not enlist in the black gold industry were quickly shifted out and left with minimal opportunity for the development of competitive and sustainable industries other than oil" (Fandl 2003, p.529).

apply a model originally designed for political violence to terrorism. This was created by Gurr, Lichbach, Davis (2004) and theorizes that the relationship between democracy and political is shaped as an inverted-U with the semi-democratic countries experiencing the greatest amount of political violence. Kurrild-Klitgaard et. al.'s results support that a similar relationship exists between democracy and terrorism, which is further supported in Abadie (2006) and Lai (2007). Because of the lack of consensus on the relationship between trade and terrorism, it is likely that trade impacts terrorism differently in countries with differing levels of democracy.

2. Economic Opportunity

The degree of economic opportunity is likely to influence how trade impacts terrorism. Economic opportunity is a broad concept that is difficult to measure, so for the purpose of this paper unemployment and inequality will be used as indicators of the likely level of economic opportunity within a country. Economic opportunity and trade are likely to interact through both unemployment and inequality; however, their relationship on terrorism in not clear. If a country lacks opportunity, then trade might increase it by creating jobs, thus increasing the opportunity cost of terrorism. Alternatively, trade could make it more difficult for displaced workers to find employment, decrease the opportunity cost of terrorism for those individuals. The literature reaches mixed conclusions on the relationship between economic opportunity and terrorism. Both Basuchoudhary and Shughart (2010) and Goldstein (2005) suggest that lack of economic opportunity is positively related to terror.[15] But Krueger and Maleckova (2003) find that the majority of terrorists are more likely to above the poverty line than the general population.[16] De Mesquita (2005) addresses this supposed discrepancy in the effect of economic deprivation on

[15] Specifically, Basuchoudhary and Shughart (2010) find that the degree of economic opportunity is negatively related to terrorism. Goldstein (2005) finds that adult unemployment increases terror risk.
[16] Their findings were based off of solely Middle Eastern terrorist groups; however, Russell and Miller (1977) found the same to be true for European terrorists.

terrorism, and he argues that although individuals who lack economic opportunity may volunteer for terrorist organizations, the groups select the highest quality of volunteers to carry out the attacks. And de Mesquita's findings supported the argument that negative economic circumstances are positively related to terrorism.

In addition to economic opportunity, the degree of inequality is likely to impact the relationship between trade and terrorism. Trade also tends to create "losers" and "winners" as previously discussed, which might increase inequality. Bird Blomberg and Hess (2005) found that relative economic deprivation matters more than absolute deprivation as a causal factors of terrorism because it creates more dissatisfaction with the status quo.[17] And, an unequal society is more likely to have higher rents to be obtained by terrorism. These findings suggest that the level of inequality within a country might influence the impact of trade on terrorism.

3. Education

The level of education within a country might also interact with the impact trade has on terrorism. Potentially, a country that has a higher level of education would be less susceptible to changes in the economic structure because education is heavily related to workers' skill level, which might impact not only how prepared workers are to adjust to trade, but also how a country specializes and decides its basket of exports. There have been mixed findings on the impact of education on terrorism. Krueger and Maleckova (2003) find that terrorists themselves are more likely to be better educated, which can be partially explained by de Mesquita's findings that terrorist groups screen for higher quality volunteers. But Azam and Thelen (2008) find that secondary education reduces terror. Krieger and Meierrieks (2008) use education as a proxy variable for studying the impact of modernization on terror and are unable to reach a definitive

[17] "From an economic point of view, it would suggest that the incidence of terrorist events will be associated with the degree of inequality, or, if its deprivation rather than relative deprivation that creates dissatisfaction, it will be associated with absolute poverty" (Bird, Blomberg and Hess 2008 p.260)

conclusion about the impact of education; however, their theory is relevant to this paper because trade might also impact modernization.

4. Natural Resource Dependency

If an economy is heavily dependent on natural resources, then trade might have a different impact on terrorism. Tying back to the Hausmann et. al's (2005) theory that lower quality exports are likely to negatively impact a country's experience of globalization, countries that are more dependent on natural resources might have a lower quality of exports, which could impede its development. Alternatively, if foreign countries are more dependent on a country for natural resources, then it might have reduced transnational terrorism because foreigners want to maintain access to the country's natural resources.

D) The Impact of Exports Over Time

The amount of time following changes in international trade might change how trade impacts terrorism. The amount of time it takes an economy to readjust following trade shocks depends on the size of the trade shock, type of economy, and type of trade. Davidson and Matusz (2001) have found that it could take up to ten years for an economy to return to full capacity following a large increase in trade. This suggests that as an economy adjusts to a trade shock, the opportunity costs of terrorism is might change and most likely increase, so this paper will evaluate if changes in trade have a lagged impact on terrorism. People, in addition to economies, also need time to adjust to changes in trade because it might take time to feel the effects of trade.[18] Once they do, it also will take time to join, or potentially disaffiliate, from a terrorist group, and then even more time is required to plan and carry out an attack. In the broader relationship between trade and terrorism, none of the effects are immediately felt, so examining lagged effects of trade will likely provide more information on how trade is impacting terrorism.

[18] Chaudhuri and McLaren (2008)

III. DATA & METHODS

This paper uses a fixed-effects negative binominal model to analyze the impact of trade on the number of terrorist incidents in 195 countries between 1970 to 2015. Although 195 countries were initially included in the data, most models include around 152 countries, based on the data's availability.[19] The original 195 countries include both developed and developing countries, and they were selected based on their availability of data for both the independent and dependent variables: trade and terrorism. *Appendix Table 1* lists out these countries and stars the countries excluded from most models. For the dependent variable, the main unit of observation is the number of terrorist events during a given year (t) within a given country (i). There are four other variations of the dependent variable examining different types of terrorism including domestic and transnational, but they all examine the number of incidents within a given year within a given country. The data is organized in panel form based on the year and country, which allowed for country level fixed-effects to be controlled.

A. Dependent Variable: Terrorism

Data on the number of terrorist events comes from the *Global Terrorism Database,* which is collected by the *National Consortium for the Study of Terrorism and Response to Terrorism (START)* at the University of Maryland. The *Global Terrorism Database* (henceforth referred to as "GTD") has documented 156,557 total incidents of terror from 1970 to 2015 in 226 countries. To compile the dataset, the database used newspaper reports, which has possible consequences. First, there could be possible underreporting in autocratic countries with less free press. And the number of documented incidents is likely to increase over time. Finally, this collection method could potentially exclude less successful terrorist incidents that did not making it into the news. Despite these drawbacks, the GTD is a widely used source that many papers have used. Due to

[19] Most of these countries were excluded due to lack of available polity data.

of a bizarre error occurring during a move, the database does not include data from 1993.[20] Because of this error, this paper treated data from 1993 as missing in the analysis. Additionally, the database's collection methods and definitions changed in 1997. This paper preformed analysis comparing post-1997 results and found no significant differences. Kis-Katos and Liebert (2011) and others that use the GTD do not control for this change, so it was determined not to be problematic.

As previously stated, this paper defines terrorism based on the number of terrorist events within a given country within a given year, but no universal standard exists for determining what classifies as a terrorist event. This paper will use the *GTD* classification of terrorism, a practice adopted by past papers. The GTD's standard for terrorism is a violent act that meets two out of three of the following criteria:

"1) Aimed at attaining a political, economic, religious, or social goal.

2) Intention to coerce, intimidate, or convey some other message to a larger audience (or audiences) other than the immediate victims

3) Outside the precepts of International Humanitarian Law"

The entire definition is included in the footnotes, along with the definition of terrorism that the GTD used before 1997.[21] Both the GTD and other scholars have remarked that the GTD's classification of terrorism is relatively broad in comparison to others that often require the event

[20] Information evaluating the GTD as a source comes from Lafree and Dugan (2011).

[21] The GTD uses two different definitions for terrorism. Between 1970 and 1997, the GTD defined terrorism as, "The threat 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 p.9). In 1997, the GTD revised its definition, and to be considered terrorism, the incident has to meet two out of three of the following criteria: 1) The violent act was aimed at attaining a political, economic, religious, or social goal. 2) The violent act included evidence of an intention to coerce, intimidate, or convey some other message to a larger audience (or audiences) other than the immediate victims; and 3) The violent act was outside the precepts of International Humanitarian Law. (GTD codebook p.9)

to meet the first two criteria.[22] The inclusive nature of this definition might more closely align with this paper's focus on terrorism as a means of political expression that would occur as a response to trade. Also important to note about this definition is that it excludes state terrorism, which also aligns with this paper's model that theorizes citizens, not states actors, are those most likely to be impacted by trade and then react through terrorism.

For the purpose of analysis, this paper reshaped the event level data originally in the GTD into panel data, organized at the year and country level. The GTD was used to create seven different measures for terrorism, but this paper will focus primarily on four measures of terrorism, which are: 1) "Geography", 2) "Nationality All", 3) "Transnational", and 4) "Estimated Domestic." "Geography" measures the number of terrorist incidents that occurred within the geographic boundaries of a given country in a given year. "Nationality All" measures the total number of members of a certain nationality that perpetuated acts of terror during a given year.[23] For each event listed, the GTD classifies it as either "transnational", "domestic", or "unknown", and the specific classifications from the GTD for each group are included in footnotes below.[24] The third measure used in this paper comes from the GTD classifications and is called "Transnational", which measures the number of incidents the GTD classified as transnational within in a given country in a given year. It is worth emphasizing that transnational does not indicate how much transnational terrorism a country *produced*, but instead how much

[22] The GTD was originally collected by a private security service, which is why their definition was initially designed to appeal to a broad audience by erring on the side of being more inclusive with their definition. ("Assessing and Comparing Data Sources for Terrorism Research" p.25)

[23] The GTD includes data on up to three different nationalities per terrorist incident. "Nationality", included in the Appendix Table 1, measures only what the GTD designated as the primary nationality associated with an attack while "Nationality All" includes all of the listed nationalities associated with an attack.

[24] *Transnational*: "The attack was logistically international; the nationality of the perpetrator group differs from the location of the attack. If the perpetrator group is multinational, the attack is logistically international if all the group's nationalities differ from the location of the attack". *Domestic*: "The attack was logistically domestic; the nationality of the perpetrator group is the same as the location of the attack. If the perpetrator group is multinational, the attack is logistically domestic if any of the group's nationalities is the same as the location of the attack" for *Unknown*: "It is unknown if the attack was logistically international or domestic; the nationality of the perpetrator group is unknown" (GTD Codebook p.56).

foreign terrorism that country *experienced* in a given year.[25] The final measure of terrorism, "Estimated Domestic" was created using the aforementioned GTD classifications and an intuition put forward by Kis-Katos and Liebert (2011) to create an alternative estimate of domestic terrorism. As revealed by descriptive statistics in Appendix Table 2, the GTD classified over 50% of incidents as "Unknown". This is likely because is difficult for the media to get information on the nationality of the perpetrator, especially if they are not caught by the authorities.[26] Kis-Katos and Liebert (2011) recognized the large amount of unknowns and assumed them to be domestic terrorism incidents because foreign perpetrations would have attracted more attention, thus increasing the likelihood that an unknown perpetrator is based domestically.[27] "Estimated domestic" adds the events classified as "Unknown" with the events classified as "Domestic." Below, Table 1 provides descriptive statistics of the four major measures of terrorism used in this paper:[28]

Table 1: Descriptive Statistics for the Four Major Measures of Terrorism

	Total No. of Events	**% Classified in GTD**	**Mean**	**Std. Dev.**	**Min**	**Max**	**25%, 50%, & 75%**	**90%, 95%, & 99%**
Geography	156,550	99.99%	17.903	105.991	0	3925	0, 0, 3	22, 73, 354
Nationality All	147,346	94.12%	17.769	105.207	0	3918	0, 0, 3	21, 70, 361
Transnational	5,820	3.71%	0.656	4.265	0	102	0, 0, 0	1, 2, 16
Estimated domestic	150,731	96.29%	17.170	105.119	0	3925	0, 0, 2	20, 64, 353

Table 1 reveals for all measures of terrorism, the dependent variable is over dispersed. The majority of observations are zeros and the standard deviation of each variable is greater than

[25] A remark on the classification standards for the GTD: there are lower classification standards for domestic terrorism opposed to transnational terrorism because because only one member of the group has to have the same nationality as the location of the attack. This could suggest that the events that are classified by the GTD as transnational are infact completely transnational in nature.
[26] Lafree and Dugan (2007), p.183
[27] "We assume that the origin and the location country coincide. Finally, for the remaining observations with unknown perpetrators we set origin country equal to location. Alternatively, we also rebuild our terrorist incident variables by excluding the incidents with unknown perpetrators" (Kis-Katos and Liebert 2011 p.S35)
[28] Descriptive statistics on the full seven measure of terrorism can be found in *Appendix Table 2.*

the mean. The negative binomial model accounts for this type of distribution. Additionally, transnational terrorism accounts for a small proportion of total events, which further supports the importance of not only studying transnational terrorism, but also domestic terrorism. Even though transnational terrorism has a smaller share of observations, it will still be included because it offers unique information that will be useful in comparing how trade impacts various types of terrorism. The descriptive statistics associated with "Estimated Domestic" resembles those of "Geography" and "Nationality All", which suggest its reasonability as a measurement.

B. Independent Variable: International Trade

Similar to terrorism, the independent variable in this analysis, trade, can be measured in different ways. To maintain consistency, all variables are measured in current USD$. Although an ideal measurement would reflect the changes in prices and purchasing power over time, such as market prices, data for all variables was not available in those units. For all variables in current USD$, log of its the per-capita value was generated, and that version of the variable is what is included in all of the models. Below, *Table 2* lists the descriptive statistics for the primary trade variables in their per capita form, but *Appendix Table 3* offers more extensive statistics on the different forms of these variables, including descriptive statistics on their net and per capita log forms.

Table 2: Descriptive Statistics on Major Trade Variables: [29] all amounts measured in per capita, current USD$

	Obs	Mean	Std. Dev.	Min	Max
Exports, pc	6,628	4083.977	11966.67	0.398	237037
Imports, pc	6,628	3695.256	9977.029	0.229	199267.5
Total trade, pc	6,628	7779.234	21843.96	0.656	436304.5
Net trade, pc	6,628	388.721	2885.449	-9630.375	54658.83
Merchandise exports, pc	7,661	2481.507	6323.457	0.183	78998.46
Fuel exports, pc	5,371	715.700	2930.206	0	57719.89
Agricultural exports, pc	5,607	58.036	143.968	0	2340.345
Food exports, pc	5,638	337.989	828.357	0	11205.43
Manufacturing exports, pc	5,622	1684.107	4881.381	0	54247.61
Ores & Medals exports, pc	5,550	157.406	576.473	0	10376.93
Total trade, as a % of GDP	6,507	0.822	0.534	0.002	5.317
Net trade, as a % of GDP	6,507	-.0551	0.192	-3.448	0.817
% Change in Total Trade [30]	6,437	0.084	0.201	-0.738	3.679
% Change in Exports	6,437	0.090	0.235	-0.915	3.280

A. Control Variables

Following precedent established in Kis-Katos and Liebert (2011), all models will include four primary control variables: the log of population, the log of GDP per capita, the log of total trade per capita, and polity.[31] Table 3 lists the descriptive statistics associated with these variables, and full descriptive statistics of the net and logged version of these variables can be found in Appendix Table 5.

[29] For the different exports listed on this table: the World Bank offers data on how what proportion they make up of merchandise exports, which include fuel, agricultural, food, manufacturing, and ores and medal exports. The World Bank only offers data on the percentage these various components are of total merchandise trade. To compute the values listed on the chart here, their percentage of merchandise trade was multiplied by the country's total merchandise trade, measured in current USD$ and then divided by the country's population. Descriptive statistics for the data originating directly from the World Bank can be found in Ap*pendix Table 2A*.

[30] For "% Change in total trade" along with other change variables, there were a very small number of strange observations that huge percent changes that were making it difficult the model to find results and inflating the standard deviation. For these reasons, any observation that had over a 500% change was excluded from the models and descriptive statistics.

[31] Kis-Katos and Liebert (2011) also included polity and the Gini co-efficient as a primary control variables; however, due to a lack of available data, the gini co-efficient will be excluded as a control variable and instead treated as a primary interest variable.

Table 3: Major Control Variables Descriptive Statistics

	Obs	Mean	Std. Dev.	Min	Max
GDP pc, in current USD$	7,267	8070.022	14543.73	57.635	178713.2
Population	8,831	2.85e+07	1.11e+08	5450	1.37e+09
Total Trade pc, in current US$	6,628	7779.234	21843.96	0.657	436304.5
Polity	6,594	1.205	7.498	-10	10

B. Primary Interest Variables

The primary interest variables provide information about the four different types of economic and political systems investigated in this paper. "Polity" provides information on the level of democracy within a country, and although this variable is also included in the major control variables, categorical and interaction versions of it will be used as a primary interest variable. The "Gini Coefficient" and "Unemployment Percent" provide information on the degree of economic opportunity. "Primary Education Completion Rate" along with the three other measures breaking down the education level of the labor force provides information about the skill level of the workers within a country. "Natural Resource Rents" provide information to about what percentage of government revenue comes from natural resources. The descriptive statistics for these variables are listed below in Table 4.

Table 4: Interest Variables Descriptive Statistics:

	Obs	Mean	Std. Dev.	Min	Max
Polity	6,896	1.20	7.498	-10	10
Gini Co-efficient	1,253	0.398	0.100	0.162	0.658
Unemployment %	4,128	0.089	0.063	0.001	0.393
Natural Resource Rent %	6,360	0.077	0.117	0	0.914
% Labor force with Primary Education	1,369	0.302	0.171	0	0.806
% Labor force with Secondary Education	1,366	0.421	0.173	0.005	0.802
% Labor force with tertiary education	1,371	0.221	0.105	0.001	0.563
Primary Educ. Completion rates	4,082	0.779	0.269	0.015	1.853

C. Empirical Model

This paper will use a fixed-effects negative binomial model to account for the over dispersion of the count dependent variable. The objective of the model matches with the distribution of the various measurements for the dependent variables, which aligns with the distribution of the data used in this paper.[32] Previous literature has also used this model, but a smaller portion has used the fixed-effect version, which will allow for country specific factors to be controlled. The equation below models the number of terrorist incidents within a given country (i) within a given year (t), which corresponds to the "Geography" (G) measure of the dependent variable, which is represented in the equation as: T_{it}^{G} . δ_i captures country specific fixed effects, and λ_{it} is an exponential function that contains a vector of the major explanatory variables, defined as $\lambda_{it} = \exp(X_{it}\beta)$.

$$\Pr\left(T_{it}^{G} = t_{it}^{G} \middle| X_{it}, \delta_i\right) = \frac{\Gamma(\lambda_{it} + y_{it})}{\Gamma(\lambda_{it})\Gamma(y_{it}+1)} \left(\frac{1}{1+\delta_i}\right)^{\lambda_{it}} \left(\frac{\delta_i}{1+\delta_i}\right)^{y_{it}}$$

$$\ln(\lambda_{it}) = b_0 + b_1 \ln(Totaltradepc_{it}) + b_2 \ln(GDPpc_{it}) + b_3 \ln(population_{it}) + b_4 polity_{it} + \gamma_{it}$$

IV. RESULTS

Each of the models included in the results section includes the previously discussed control variables. The incident rate ratio (IRR) coefficient is included underneath the standard deviation of the typical negative binomial coefficient. The IRR captures the same information as the first coefficient, but captures percent change in expected terrorism. For instance, if the IRR coefficient was 1.15, then a one unit change in the explanatory variable would result in a 15%

[32] Land McCall and Nagin (1996)

increase in the dependent variable. Thus, IRR values below one indicate a negative relationship, and IRR values above one indicate a positive relationship. Additionally, each table included in the results section has the Wald Chi-Squared statistic and degrees of freedom associated with each model, which compare the model to the null hypothesis. Finally, each table also included the number of countries and total observations in each model. For many of the models, the results found for "Estimated Domestic" and "Nationality All" closely resembled the results of "Geography." If different measures of terrorism had similar results, then just the results found for "Geography" are listed. If the results differed, then they are either included or mentioned in the discussion.

A. Baseline Results

Table 5: Baseline Results from Control Variables:

	"Geography" No. of terrorist events occurring in country (i) during year (t)	**"Nationality All"** No. of terrorist incidents perpetuated by members of country (i) during year (t)	**"Transnational"** No. of transnational terrorist events occurring in country (i) during year (t)	**"Estimated Domestic"** Estimate of no. of terrorist events occurring in country (i) during year (t) perpetuated by member of country (I)
	(1)	**(2)**	**(3)**	**(4)**
Population, log	0.122*** (0.021) 1.130	0.161*** (0.020) 1.174	0.101* (0.046) 1.107	0.140*** (0.021) 1.151
GDP per capita, log	0.342*** (0.053) 1.408	0.337*** (0.052) 1.400	0.047 (0.122) 1.049	0.345*** (0.054) 1.411
Log of Total Trade per capita	-0.205*** (0.045) 0.815	-0.094 (0.052) 0.910	-0.048 (0.104) 0.953	-0.201*** (0.046) 0.818
Polity	0.036*** (0.004) 1.036	0.024*** (0.004) 1.025	0.071*** (0.008) 1.073	0.034*** (0.004) 1.035
Wald Chi-Square	397.36***	611.04***	123.20***	393.25***
Degrees of Freedom	4	4	4	4
No. of countries	153	156	108	154
No. of observations	5,327	5,448	4,019	5,371

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

Table 5 lists the baseline results found for the control variables. For all measures of terrorism, "Total Trade"[33] is negative; however, its significance and estimates vary among the different types of terrorism. "Total trade" is most related to "Geography" and "Estimated Domestic", which indicates that as a country participates in more trade, it is likely to experience a decrease in the number of terrorist events within its borders. "Total trade" is also negatively related to "Nationality All" and "Transnational", but it is not significant and has lower coefficients. These results suggest that total trade is most directly related to domestic terrorism, opposed to producing terrorist nationals or experiencing foreign terrorism. The IRR coefficient for "Geography" is 0.815, which estimates that a $1,000 increase in total trade per capita would result in a 0.54 decrease in the number of expected terrorist events within a given year within a given country. Potentially trade is benefiting individuals within these countries by providing more access to jobs and goods, which the increases the opportunity cost of terrorism. This explanation would explain why trade has a stronger relationship with measure of domestic terrorism than transnational terrorism.

For all types of terrorism, "Polity" is both significantly and positively related with terrorism, which past papers have found as well. The IRR coefficient associated with polity is 1.036 for "geography", which suggests that if a country were to increase from non-democratic country to a democratic country, going from a polity score of zero to ten, then it would be expected to experience 1.42 additional terrorist events. "Transnational" actually has the greatest "polity" coefficient, which is somewhat surprising because it suggests that democracy has a greater impact on the number of foreigners who carry out terrorist attacks within the country, opposed to impacting the country's own citizens. The baseline results on polity do not reveal if its impact on

[33] Within the discussion, many of the variables are referred to using abbreviated names. "Total Trade" refers to the logged value of total trade per capita, and "GDP" refers to the logged value of GDP per capita, ect.

terrorism is consistent across countries with different levels of democracy and how that might impact trade, so that will be investigated further in models later on.

For all measures of terrorism, “Population” is positive and significant, which suggests that as a country gets larger the expected number of terrorist events is likely to increase. This relationship was also widely found in past literature. “GDP per capita” is also positive for all measurements of terrorism; however, there is a difference in both the size and significance of the coefficients associated with “Transnational” compared to the other measurements for terrorism. This difference suggests that wealthier countries, indicated by their GDP per capita, are more likely to experience domestic versions of terrorism opposed to transnational terrorism. For the most part, previous literature has also found a positive relationship between GDP per capita and terrorism, so these results indicate that baseline results are reasonable within the context of past literature.

B. Different Types of Exports

Table 6: Results Different Exports:

	"Geography" No. of terrorist events occurring in country (i) during year (t)	**"Nationality All"** No. of terrorist incidents perpetuated by members of country (i) during year (t)	**"Transnational"** No. of transnational terrorist events occurring in country (i) during year (t)	**"Domestic Estimate"** Estimate of no. of terrorist events occurring in country (i) during year (t) perpetuated by member of country (I)
	(1)	**(2)**	**(3)**	**(4)**
Fuel Exports, logged per capita	-0.007 (0.011) 0.993	-0.023* (0.010) 0.978	0.003 (0.021) 1.003	-0.008 (0.011) 0.992
Ores & metals Exports, logged per capita	-0.055*** (0.016) 0.946	-0.075*** (0.015) 0.928	-0.080* (0.040) 0.923	-0.056*** (0.016) 0.945
Agriculture Exports, logged per capita	0.013*** (0.022) 1.013	0.064** (0.021) 1.066	0.043 (0.050) 1.043	0.014 (0.022) 1.014
Food Exports, logged per capita	-0.092** (0.029) 0.912	-0.119*** (0.027) 0.888	-0.098 (0.069) 0.907	-0.084** (0.029) 0.919
Manufacturing Exports, logged per capita	0.130*** (0.026) 1.139	0.098*** (0.025) 1.10	0.226*** (0.057) 1.253	0.108*** (0.027) 1.114
Log of Total Trade per capita	-0.397*** (0.074) 0.673	-0.178* (0.071) 0.837	-0.343* (0.159) 0.710	-0.371*** (0.075) 0.690
Wald Chi-Square	307.56***	499.05***	101.19***	304.11***
Degrees of Freedom	9	9	9	9
No. of Countries	132	139	93	133
Total No. Countries	3,912	4,047	3,127	3,955

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

By examining the impact of five different exports on the different measures of terrorism, Table 6 reveals that not all exports have the same impact on terrorism. The differences in the signs of the exports are particularly interesting because although the overall relationship between total trade and terrorism appears to be negative, not all components of trade have the same impact. Similar to the impact of total trade, food exports and ores and metal exports are negatively related to terrorism. Manufacturing exports and agricultural exports are positively related to terrorism, which suggests that as a country exports more of these goods the expected

number of terrorist events within their country should increase. Somewhat surprisingly, fuel exports are the least related to terrorism, having both the lowest coefficients and significance levels of all the exports.

The more manufacturing goods and agricultural products a country exports, the more likely the country is to experience terrorism. And, this positive relationship is especially true for manufactured goods. If manufacturing exports were to increase by $1,000 per capita, then the expected number of terrorist events would increase by 1.48. Many economists have argued that manufacturing exports help to catalyze growth, especially within developing countries.[34] As an economy advances among the different stages of development, it is likely to experience a greater degree of economic disruption in comparison to a country that maintains a consistent level of development and economic structure, which could explain why manufacturing exports in particular have such a large relationship with terrorism.

Alternatively, food exports and ores and metal exports are found to be negatively related with terrorism. Ores and metal exports, are not generally catalyst for economic development within a country, and fall within the low quality of exported goods, which Hausmann et. al. (2007) found likely to impede a country's development. Potentially instead of leading to growth within a country, these low quality exports keep a country at a consistent level of development, which does not create the same type of economic disruption, which might increase the likelihood of terrorism that manufacturing export do.

Somewhat surprisingly, fuel exports do not appear to be connected to the number of terrorist events a country experiences. This paper also investigated models that examined the impact of both the log of fuel exports per capita and the percentage of fuel exports of merchandise exports. In these models, fuel exports per capita is still negative but insignificant at a 95% level for all

[34] Soderbom and Teal (2002)

measures of terrorism. When fuel exports were included as a percentage of merchandise exports, it still remained insignificant at a 95% level, but it was positively related to domestic terrorism and negatively related to transnational terrorism. Even then the coefficients for percent fuel exports were still much lower than the coefficients found for the percentage of other exports, which further supports Table 6's findings that fuel exports do not have much of a relationship with terrorism. This lack of connection between fuel exports and terrorism is contradicts Fandl (2003)'s theory that fuel exports lead to increases in terrorism. Fandl's article was theoretical in nature and written in 2003, so he draws heavily upon examples from the Iraq war era to support his argument, instead of relying on empirical support. Potentially the time-period in which he wrote the article had a greater impact on his argument than the broader relationship among fuel exports and terrorism. Of the eight countries with the greatest fuel exports per capita, the average number of terrorist events is actually 0.9 per year, which is much less than the average of about 17.9 terrorist events within the data.[35] These results suggest that fuel exports might not be related to the number of terrorist attacks experiences within a country; however, they do not rule out the possibility that fuel exports could have a regional effect. Another possible about the lack of explanation of the lack of a relationship between terrorism and fuel exports might be related to the measurement of terrorism as the number of events. Potentially fuel exports are related more to serious terrorist events that have greater causalities, costlier, or attract more media attention. If that was the case, then this measure would not capture the relationship because it does not consider the severity of the terrorism.

[35] Qatar has the highest average amount of fuel exports per capita $19,439 and averaged 0.15 terrorist events; UAE $11,771 with 0.49 avg. events, Brunei $11,497 with 0.022 avg. events, Kuwait $9,527 with 1.64 avg. events, Norway $7,183 with 0.4 avg. events, Saudi Arabia $5,349 with 4.28 avg. events, Oman $4,627 with 0 avg. events and Singapore $4,115 with 4.28 avg. events.

C. Various Economic and Political Systems

1. Democracy

Although the baseline results found polity to be positively related to terrorism, Appendix Table 6 suggests that polity might have a differing effect depending on the level of democracy within the country, which suggest that there is a non-monatomic relationship between democracy and terrorism. Polity was found to be positive for "highly democratic countries"; however, the relationship between polity and terrorism changed in sign for the "moderately democratic countries" and "undemocratic countries".

More important for the focus of this paper is that the relationship between total trade and terrorism varied among the groups. And highly democratic countries had the highest coefficient followed by undemocratic countries then moderately democratic countries. Potentially democratic countries are more likely to structure trade in a way that benefits a greater share of the population compared to the other groups of countries. Alternatively, the level of polity could be influencing the means through which people react politically to trade.

2. Economic Opportunity

The findings on how economic opportunity influences trade's impact on terrorism is not clear. Appendix Table 7 lists results associated with the degree of economic opportunity within a country, which are represented by "Unemployment Percent" and the "Gini Coefficient." "Unemployment" was found to be positively related to terrorism, which is inline with the story of the opportunity costs of terrorism being related to jobs. But the "Gini coefficient" was found to be negatively related which strangely suggests that less equal societies are more likely to experience terrorism. There are both possible theoretical and empirical explanations for this

relationship. A large section of the data is missing for the "Gini coefficient" and a large proportion of the missing data is from Middle Eastern countries. A possible theoretical explanation is that less equal societies are less likely to have economic growth, so inequality hinders development, which keeps the economy in a steady state, preventing disruption that might increase the likelihood of terrorism. When these variables are included, they do increase the coefficient of total trade, which does suggest that there is a degree of interaction; however, the potential correlations between unemployment and total trade and the missing data make it difficult to understand how the level of economic opportunity is influencing trade's impact on terrorism.

3. Education

Appendix Table 8 reveals that the impact of education has very different impacts for the "Geography" and "Transnational" measurements of terrorism. For both measures of terrorism, "Primary Education Completion Rates" are positively related, which suggests that as more people receive a basic education, terrorism is likely to increase; however, "Primary Education" was much more significant and had a higher coefficient for "Transnational" terrorism in comparison to "Geography." This difference in the findings for "Primary Education" suggest that as a greater share of a country's population receive a baseline education, the more likely the country is to experience terrorist attacks perpetuated by foreigners. There is no clear relationship between the educational level of the labor force, terrorism, and trade. Potentially there would be a stronger relationship if specific types of trade were examined along with the corresponding education skill level of the necessary laborer. This type of relationship might be difficult to capture in these broader measures of trade.

4. Dependency on Natural Resources

The coefficient for "Natural Resource Rents" was negative, but insignificant for all measures of terrorism. In models that included only countries that were natural resource dependent, indicated by having "Natural Resource Rents" one standard deviation above the mean, "Natural Resource Rents" becomes significant, but only for the "Transnational" measurement of terrorism. Results from this model are included in Appendix Table 9. The variable "Natural Resource Rents" measured the amount of money that the government received from natural resources and is only available for a small portion of the data, so an alternative variable was created to examine the economy's dependency on natural resources. This variable, "Natural Resource Exports Percent" sums the percentage of fuel and ores and metal exports within a country. It was not significant for "Geography", "Nationality All", or "Estimated Domestic"; however, it was significant at a 99% level for "Transnational", and that model and its estimates are also included in Appendix Table 9 below. Both ways of measuring natural resource dependency are negatively related with transnational terrorism only, which suggests that as a country becomes more dependent on natural resources then it is less likely to experience terrorist attacks by foreigners. Potentially, foreign countries are dependent countries with high natural resources, which discourages foreigners from carrying out transnational terrorist attacks in these countries.

D. Changes in Exports Overtime

Appendix Tables 10-13 display the lagged impacts of a change in various types of trade on the "Geography" measure of terrorism. These results suggests that the majority of exports do not have a lagged effect on terrorism; however, there is some lag effect associated with total trade

and the coefficient and significance of total trade does increase after four years to be positively relationship with terrorism. This could suggest that it does in fact take time for people to react to the negative consequences of trade, since the lag effect becomes positive. Potentially the other exports are not creating the type of disruption that would more likely prompt terrorism, but instead imports, which is then captured in total trade. This would then explain why the majority of coefficients for the different exports were zero. The only export that did not have consistent zeros for coefficients was, surprisingly enough, fuel, which was found to be unrelated to terrorism earlier on in the paper. These results suggest that trade does in-fact have some sort of lag effect on terrorism overtime, but incorporating results associated with exports could strengthen this claim.

V. CONCLUSION

Overall, this paper consistently finds that total trade is negatively related to both domestic and transnational terrorism and has a greater impact on domestic terrorism compared to transnational terrorism. Although total trade is negatively related to terrorism, many of the exports examined in this paper have differing relationships with terrorism, which seems to be related to the quality of the export and its impact on development. Additionally, this paper finds evidence that different economic and political systems do influence the type of impact that trade has on terrorism, which is an important finding for those who want to potentially use trade policy to reduce terrorism. This paper does find evidence that trade has a lagged effect on terrorism; however, more research is also needed on the lagged effect of imports on terrorism.

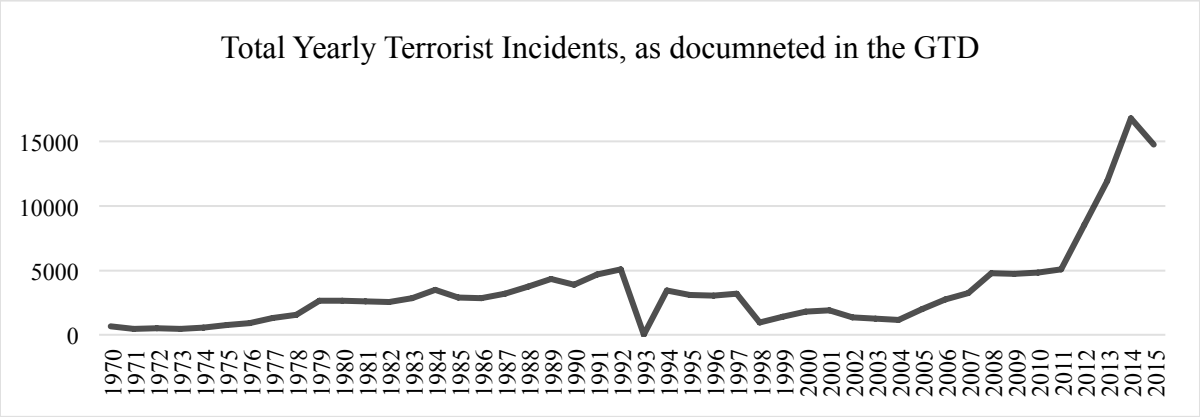
With any research, there are limitations. This analysis does not rule out the possibility trade could be impacting terrorism through having more open boarders, which would allow terrorist groups to transport more goods and people. This paper strongly considered including data on

human trafficking as an indicator for the degree of openness of a boarder to address this argument; however, this measure was deemed imprecise because it depended heavily on the extent to which a country patrolled its borders. This argument would have been more problematic if the relationship between increasing trade and terrorism was positive, but it was not the case.

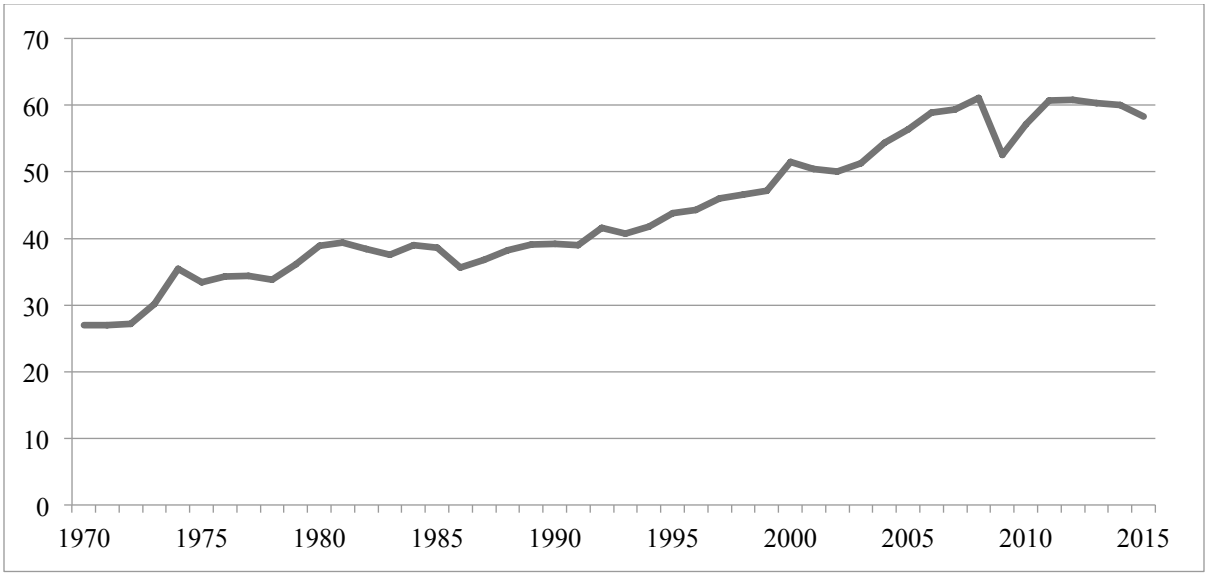
The findings of this paper could be used as potential polices for a country to reduce terrorism; however, I, personally, am skeptical that they would in-fact reduce terrorism in any given country. Although highly inconclusive, the various economic and political systems section of this paper did present a number of scenarios when trade's impact on terrorism was altered depending on the type of economic and political structure with in a country. Furthermore, many of the exports that are negatively related to terrorism are also related to underdevelopment, which suggest that there is a tension between terrorism and development, which creates difficult tradeoffs between development and terrorism, which a country's leaders would have to consider. The most effective terror reducing trade policy would be designed to complement a country's economic goals, consider the country's relative factor endowment and advantages, and align with the country's economic and political system. This policy formula suggests that what trade policy works to reduce terrorism in one country might not be effective in another country. So although trade has the ability to improve wellbeing and reduce terrorism, it depends on the country to harness that effect.

VI. APPENDIX

Appendix Graph 1: Total Terrorism between 1970 to 2015:
Note: the GTD does not have data for 1993, which is why this graph reflects it as a 0.



Appendix Graph 2: Total Trade as a Percentage of GDP for the World
Data for graph comes from the World Bank



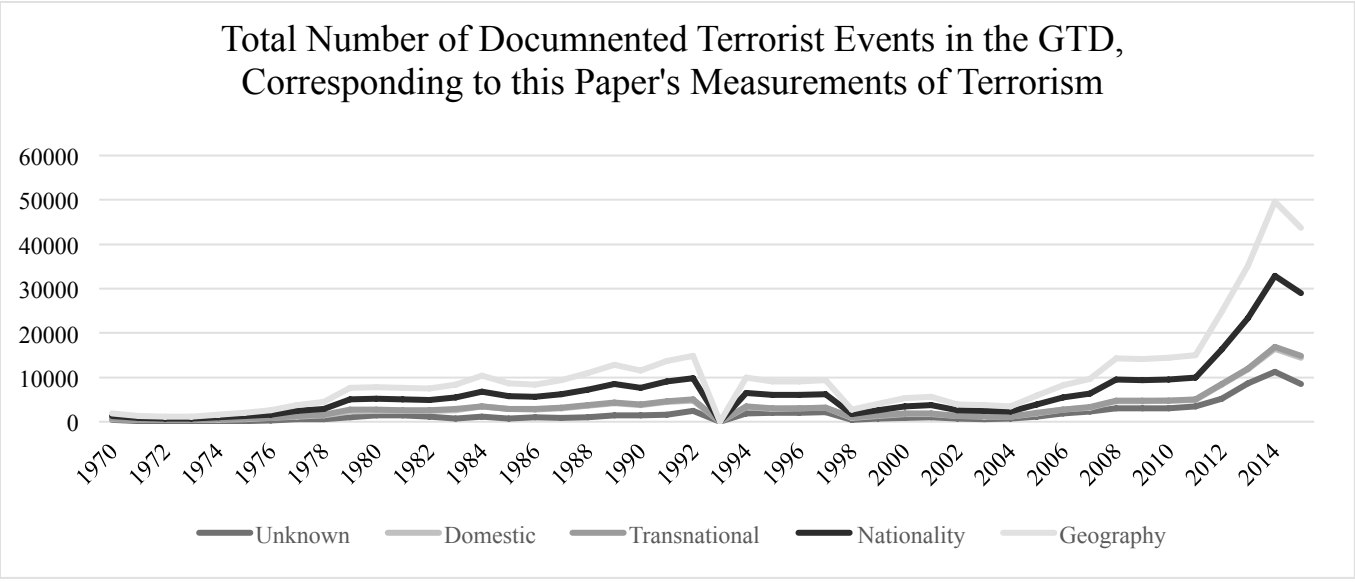
Appendix Table 1: Complete list of 195 countries initially included in analysis:
* designates that a country was excluded in most models due to lack of available data, most often for polity.

Afghanistan	Central African Republic	Ghana	Lebanon	North Yemen*	St. Lucia*
Albania	Chad	Gibraltar*	Lesotho	Norway	St. Martin*
Algeria	Chile	Greece	Liberia	Oman	Sudan
Andorra*	China	Greenland*	Libya	Pakistan	Suriname
Angola	Colombia	Grenada	Liechtenstein*	Panama	Swaziland
Antigua and Barbuda*	Comoros	Guatemala	Lithuania*	Papua New Guinea	Sweden
Argentina	Costa Rica	Guinea	Luxembourg	Paraguay	Switzerland
Armenia*	Croatia*	Guinea-Bissau	Macau*	Peru	Syria
Australia	Cuba	Guyana	Macedonia*	Philippines	Tajikistan*
Austria	Cyprus	Haiti	Madagascar	Poland	Tanzania
Azerbaijan*	Czechoslovakia	Honduras	Malawi	Portugal	Thailand
Bahamas*	Democratic Republic of the Congo	Hong Kong*	Malaysia	Puerto Rico*	Togo
Bahrain	Denmark	Hungary	Maldives*	Qatar	Tonga*
Bangladesh	Djibouti	Iceland*	Mali	Republic of the Congo	Trinidad and Tobago
Barbados*	Dominica*	India	Malta*	Romania	Tunisia
Belarus	Dominican Republic	Indonesia	Mauritania	Russia	Turkey
Belgium	East Germany	Iran	Mauritius	Rwanda	Turkmenistan*
Belize*	Ecuador	Iraq	Mexico	Saudi Arabia	Uganda
Benin	Egypt	Ireland	Moldova*	Senegal	Ukraine*
Bermuda*	El Salvador	Isle of Man*	Mongolia	Serbia*	United Arab Emirates
Bhutan	Equatorial Guinea	Israel	Montenegro*	Seychelles*	United Kingdom
Bolivia	Eritrea*	Italy	Morocco	Sierra Leone	United States
Bosnia-Herzegovina*	Estonia	Ivory Coast	Mozambique	Singapore	Uruguay
Botswana	Ethiopia	Jamaica	Myanmar	Slovak Republic*	Uzbekistan*
Brazil	Fiji	Japan	Namibia	Slovenia*	Vanuatu*
Brunei*	Finland	Jordan	Nepal	Solomon Islands	Venezuela
Bulgaria	France	Kazakhstan*	Netherlands	Somalia	Vietnam
Burkina Faso	French Polynesia*	Kenya	New Caledonia*	South Africa	West Bank and Gaza*
Burundi	Gabon	Kosovo*	New Zealand	South Korea	Yemen
Cambodia	Gambia	Kuwait	Nicaragua	South Sudan*	Zambia
Cameroon	Georgia*	Kyrgyzstan	Niger	Spain	Zimbabwe
Canada	Germany	Laos	Nigeria	Sri Lanka	
Cayman Islands*		Latvia*	North Korea	St. Kitts and Nevis*	

Appendix Table 2: Full Descriptive Statistics on the Seven Measures of Terrorism:

	Number of Incidents	% Indicated by GTD	Mean	Std. Dev.	Min	Max	90%, 95%, and 99%
Geography	156,550	100%	17.902	105.991	0	3925	21, 68, 350
Nationality	147,346	94.12%	16.732	101.864	0	3917	17, 62, 343
Nationality All	147,346	94.12	17.769	105.207	0	3918	19, 67, 349
Transnational	5,820	3.71%	0.656	4.265	0	102	0, 2, 15
Domestic	66,039	42.18%	7.526	43.030	0	1311	7, 25, 182
Unknown	84,692	54.09%	9.644	81.572	0	3866	10, 27, 159
Estimated Domestic	150,731	96.29%	17.170	105.119	0	3925	17, 53, 300

Appendix Graph 3: Various Measures of Terrorism between 1970 to 2015:



Appendix Table 3: Full Descriptive Statistics on Trade Variables:

	Obs	Mean	Std. Dev.	Min	Max
***Exports**, in current USD$*	6,631	5.09e+10	1.65e+11	3149286	2.52e+12
...per capita	6,628	4083.977	11966.67	0.398	237037
...log per capita	6,628	6.538	2.032	-0.922	12.376
***Imports**, in current USD$*	6,631	5.01e+10	1.73e+11	1.14e+07	2.88e+12
...per capita	6,628	3695.256	9977.029	0.229	199267.5
...log per capita	6,628	6.72253	1.835	-1.475	12.202
***Total Trade**, in current USD$*	6,631	1.01e+11	3.37e+11	2.51e+07	5.26e+12
...per capita	6,628	7779.234	21843.96	0.657	436304.5
...log per capita	6,628	7.351	1.908	-0.420	12.986
Total Trade, as a % of GDP	6,507	0.822	0.534	.0016742	5.317374
***Net Trade** , in current USD$*	6,631	7.96e+08	3.47e+10	-7.71e+11	3.86e+11
...per capita	6,628	388.721	2885.449	-9630.375	54658.83
...log per capita	2,181	5.548	2.300	-6.077	10.909
***FDI**, in current USD$*	6,973	4.54e+09	2.35e+10	-3.58e+10	7.34e+11
...per capita	6,966	1165.133	14749.92	-61833.04	451018.7
...log per capita	6,376	3.416	2.785	-11.070	13.0193
***Merchandise Exports**, in current USD$*	7,668	3.62e+10	1.27e+11	1852070	2.34e+12
...per capita	7,661	2481.507	6323.457	0.183	78998.46
...log per capita	7,661	5.992	2.062	-1.700	11.277
***Fuel Exports**, in current USD$*	5,374	6.49e+09	2.29e+10	0	3.75e+11
...per capita	5,371	715.700	2930.206	0	57719.89
...log per capita	5,151	2.607	3.941	-15.578	10.963
***Agricultural Exports**, in current USD$*	5,610	9.16e+08	2.63e+09	0	4.15e+10
...per capita	5,607	58.0355	143.9679	0	2340.345
...log per capita	5,597	2.214	2.240	-10.249	7.758
***Food Exports**, in current USD$*	5,641	4.02e+09	1.11e+10	0	1.69e+11
...per capita	5,638	337.989	828.357	0	11205.43
...log per capita	5,635	4.330121	1.90171	-7.768	9.324
***Manufacturing Exports**, in current USD$*	5,625	3.31e+10	1.20e+11	0	2.20e+12
...per capita	5,622	1684.107	4881.381	0	54247.61
...log per capita	5,618	4.827	2.851502	-10.575	10.901
***Ores & metals Exports**, in current USD$*	5,553	1.91e+09	6.10e+09	0	9.99e+10
...per capita	5,550	157.406	576.473	0	10376.93
...log per capita	5,524	2.423	2.983	-12.880	9.247

Appendix Table 4: Descriptive Statistics on the Percentage Components of Merchandise Trade:

	Obs	Mean	Std. Dev.	Min	Max
% Fuel Merchandise Exports	5,428	0.167	0.291	0	3.593
% Agricultural Merchandise Exports	5,667	0.060	0.108	0	0.990
% Food Merchandise Exports	5,698	0.278	0.272	0	1.361
% Manufacturing Merchandise Exports	5,682	0.404	0.311	0	0.991
% Ores & metals Merchandise Exports	5,609	0.084	0.154	0	0.099

Appendix Table 5: Extended Descriptive Statistics of Major Control Variables:

	Obs	Mean	Std. Dev.	Min	Max
GDP, in current USD$	7,270	1.87e+11	8.96e+11	1.96e+07	1.80e+13
GDP pc, in current USD$	7,267	8070.022	14543.73	57.63513	178713.2
Log of GDP, in current USD$	7,267	7.765363	1.641341	4.054132	12.09354
Population	8,831	2.85e+07	1.11e+08	5450	1.37e+09
GDP, in current market prices	7,152	2.65e+11	1.04e+12	1.63e+08	1.66e+13

Appendix Table 6: Results on Different Levels of Democracy

Please note: the "Polity" row indicates results of polity based either on the sample restriction or the polity-squared value indicated by: Polity^2*

Geography

Total no. of terrorist events occurring in country (i) during year (t)

	All Countries (-10<Polity<10)		**Democratic (Polity>7)**	**Moderately Democratic (7>Polity>0)**	**Undemocratic (0>Polity-10)**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Polity	0.036*** (0.004) 1.036	0.042*** (0.004) 1.042	0.063 (0.057) 1.065	-0.005** (0.001) 0.995	-0.003* (0.001) 0.997
Polity^2		-0.007*** (0.001) 0.993			
Log of Total Trade per capita $USD	-0.205*** (0.045) 0.815	-0.269*** (0.044) 0.764	-0.224* (0.101) 0.799	-0.011 (0.054) 0.989	-0.142** (0.042) 0.867
Log of GDP per capita	0.342*** (0.053) 1.408	0.469*** (0.053) 1.599	0.235* (0.122) 1.265	0.338*** (0.067) 1.40	0.356*** (0.050) 1.427
Population Log	0.122*** (0.021) 1.130	0.108*** (0.021) 1.114	0.051 (0.040) 1.052	0.194*** (0.025) 1.214	0.154 (0.020) 1.167
Wald Chi Squared	397.36***	445.05***	24.43***	225.82***	324.55***
Degrees of Freedom	4	5	4	4	4
No. of Countries	153	153	73	117	154
No. of Observations	5,327	5,327	1,973	3,204	5,496

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

Appendix Table 7: Results from "Gini Coefficient" and "Unemployment":

	"Geography" Total no. of terrorist events occurring in country (i) during year (t)			**"Transnational"** No. of transnational terrorist events occurring in country (i) during year (t)		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Gini Co-efficient	-2.432***		-2.909***	-3.776		-6.069*
	(0.658)		(0.743)	(2.446)		(2.955)
	0.088		0.054	0.023		0.002
Unemployment %		2.363***	1.376		3.367**	5.173
		(0.567)	(1.174)		(1.435)	(4.656)
		10.624	3.959		28.999	176.3778
Log of Total Trade per capita	-0.731***	-0.326***	-0.972***	-0.870*	-0.148	-0.752
	(0.145)	(0.049)	(0.181)	(0.380)	(0.154)	(0.478)
	0.481	0.722	0.378	0.419	0.862	(0.471)
Wald Chi-Squared	57.34***	131.36***	75.26***	8.03	62.93***	8.79
Degrees of Freedom	5	5	5	5	5	5
No. of Countries	96	147	92	50	96	48
No. of observations	1,017	3,128	927	609	2,086	542

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

Appendix Table 8: Results from Education and Worker Skill Level:

	"Geography" Total no. of terrorist events occurring in country (i) during year (t)			**"Transnational"** No. of transnational terrorist events occurring in country (i) during year (t)		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Primary Education Completion Rates	0.307		-3.091***	1.192**		1.651
	(0.182)		(0.729)	(0.436)		(2.139)
	1.359		0.045	3.294		5.214
% of labor force with… primary education		1.321*	1.957*		-1.11	-6.114
		(0.597)	(0.967)		(1.374)	(3.33)
		3.747	7.079		0.328	0.002
% of labor force with… secondary education		0.059	0.942		-5.562**	-9.832*
		(0.674)	(0.980)		(1.797)	(4.128)
		1.060	2.564		0.004	0.000
% of labor force with… tertiary education		0.642	0.545		-1.906	-2.136
		(0.774)	(1.163)		(1.969)	(4.521)
		1.900	1.725		0.149	0.118
Log of Total Trade per capita	-0.356***	-0.902***	-1.112***	-0.274	-1.511	-1.227
	(0.065)	(0.153)	(0.210)	(0.180)	(0.401)	(0.769)
	0.700	0.406	0.329	0.760	0.221	0.293
Wald Chi-Squared	134.41***	73.73***	70.65***	45.85***	50.14***	20.53**
Degrees of Freedom	5	7	8	5	7	8
No. of countries	138	88	73	89	50	32
No. of observations	3,103	1,128	743	2,154	757	375

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

Appendix Table 9: Results on Natural Resource Dependency and Transnational Terrorism:

	"Transnational" No. of transnational terrorist events occurring in country (i) during year (t)	
	(1)	**(2)**
Natural Resource Rents	-3.750** (1.699) 0.024	
% Natural Resource Exports		-0.624** (0.226) 0.536
Change in total trade per capita		-0.477 (0.253)
Total trade per capita, log	0.667 (0.714) 1.949	-0.091 (0.128) 0.913
Wald Chi-Squared	14.73**	90.57***
Degrees of Freedom	5	6
No. of Countries	15	92
No. of Observations	304	3,105

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

Appendix Table 10: Lagged Effects of Total Trade

	"Geography" Total no. of terrorist events occurring in country (i) during year (t)				
	(1)	**(2)**	**(3)**	**(4)**	**(5)**
Year (t)	-0.205***	-0.584***	-0.579***	-0.610***	-0.553***
Log of Total	(0.045)	(0.114)	(0.117)	(0.118)	(0.122)
Trade pc	0.815	0.558	0.561	0.543	0.575
Year (t-1)		0.393**	0.196	0.204	0.097
Log of Total		(0.111)	(0.171)	(0.173)	(0.097)
Trade pc		1.482	1.217	1.226	1.102
Year (t-2)			0.171	0.067	0.141
Log of Total			(0.115)	(0.170)	(0.171)
Trade pc			1.186	1.070	1.151
Year (t-3)				0.107	-0.294
Log of Total				(0.111)	(0.168)
Trade pc				1.113	0.745
Year (t-4)					0.372***
Log of Total					(0.111)
Trade pc					1.451
Wald Chi-Squared	397.36***	411.33***	385.99***	358.83***	340.31***
Degrees of Freedom	4	5	6	7	8
No. of countries	153	153	152	151	149
No. of observations	5,327	5,285	5,144	4,986	4,851

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

Appendix Table 11: Lagged Effects of Exports vs. Imports

"Geography"

Total no. of terrorist events occurring in country (i) during year (t)

	(1)	(2)	(3)	(4)
Year (t)	-0.334*	-0.567***		
Log of Exports pc	(0.114)	(0.138)		
		0.567		
Year (t-1)		0.315**		
Log of Exports pc		(0.102)		
		1.370		
Year (t)			0.229	-0.079
Log of Imports pc			(0.148)	(0.179)
			1.257	0.927
Year (t-1)				0.305**
Log of Imports pc				(0.102)
				1.357
Wald Chi-Squared	406.51	416.48***		411.17
Degrees of Freedom	5	6		6
No. of countries	153	153		153
No. of observations	5,327	5,285		5,285

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

Appendix Table 12: Lagged Effect of Exports

"Geography"

	(1) Log of Fuel Exports PC	(2) Log of Ores & Metal Exports	(3) Log of Agricultural Exports	(4) Log of Food Exports PC	(5) Log of Manufacturing Exports PC
Year (t)	-0.051*	-0.147**	-0.064	-0.140	-0.179**
	(0.023)	(0.048)	(0.057)	(0.074)	(0.067)
	0.951	0.863	0.938	0.869	0.836
Year (t-1)	0.011	0.004	-0.041	-0.052	0.012
	(0.029)	(0.061)	(0.074)	(0.093)	(0.091)
	1.011	1.004	0.959	0.949	1.011
Year (t-2)	-0.015	0.005	0.003	0.082	0.131
	(0.030)	(0.064)	(0.076)	(0.098)	(0.089)
	0.985	1.005	1.003	1.085	0.934
Year (t-3)	0.029	-0.026	0.045	-0.007	-0.068
	(0.030)	(0.063)	(0.079)	(0.077)	(0.074)
	1.029	0.975	1.046	0.993	0.934
Year (t-4)	0.035	0.101*	0.038	0.052	0.216**
	(0.024)	(0.048)	(0.063)	(0.066)	(0.067)
	1.036	1.107	1.040	1.053	1.241
Wald Chi-Squared	199.17***	206.35***	3,266***	211.58***	235.26***
Degrees of Freedom	9	9	9	9	9
No. of countries	120	121	125	125	125
No. of observations	3,102	3,207	3,266	3,270	3,269

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

Appendix Table 13: Lagged Effects of Exports Including Total Trade

	"Geography"				
	(1) Log of Fuel Exports PC w/ total trade lag	**(2) Log of Ores & Metal Exports w/ total trade lag**	**(3) Log of Agricultural Exports w/ total trade lag**	**(4) Log of Food Exports PC w/ total trade lag**	**(5) Log of Manufacturing Exports PC w/ total trade lag**
Year (t)	-0.040	-0.000	-0.002*	-0.000	-0.000
	(0.024)	(0.000)	(0.001)	(0.000)	(0.000)
	0.960	0.999	0.999	0.999	0.999
Year (t-1)	0.012	-0.000	-0.001	-0.000	0.000
	(0.030)	(0.000)	(0.001)	(0.000)	(0.000)
	1.012	0.999	0.999	0.999	1.000
Year (t-2)	-0.024	-0.000	0.001	-0.000	-0.000
	(0.031)	(0.000)	(0.001)	(0.000)	(0.000)
	0.976	0.999	1.000	0.999	0.999
Year (t-3)	0.033	0.000	0.000	0.000	0.000
	(0.031)	(0.000)	(0.001)	(0.000)	(0.000)
	1.033	1.000	1.000	1.000	1.000
Year (t-4)	0.030	-0.000	0.001	0.000	0.000
	(0.025)	(0.000)	(0.001)	(0.000)	(0.000)
	1.030	0.999	1.001	1.000	1.000
Wald Chi-Squared	209.99***	213.16***	227.81***	246.92***	237.61***
Degrees of Freedom	13	13	13	13	13
No. of countries	118	120	123	123	123
No. of observations	3,068	3,177	3,225	3,229	3,227

Significance levels indicated by: * = 95%, ** = 99%, and *** = 99.9%

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