CONDITIONAL EFFECTS OF EDUCATIONAL ATTAINMENT ON DOMESTIC TERRORISM
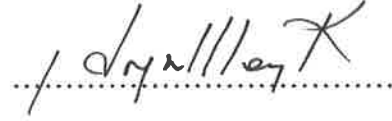
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JOHN LEE

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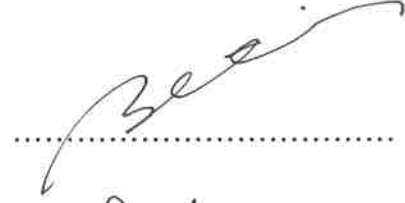Sabancı University
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CONDITIONAL EFFECTS OF EDUCATIONAL ATTAINMENT ON DOMESTIC TERRORISM

APPROVED BY:

Asst. Prof. Arzu Kıbrıs :

(Thesis Supervisor)

Prof. Ayşe Betül Çelik

Asst. Prof. Erdem Yörük

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ABSTRACT

CONDITIONAL EFFECTS OF EDUCATIONAL ATTAINMENT ON DOMESTIC
TERRORISM

JOHN LEE

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Supervisor: Asst. Prof. Dr. Arzu Kıbrıs

Keywords: educational attainment, domestic terrorism, conflict, conditional effects, diminishing returns

This thesis develops and tests a theory about the impact of educational attainment on domestic terrorism. In particular, I formulate the following three propositions: (i) the directional effect of educational attainment on domestic terrorism depends on the base year; i.e., tertiary education will reduce terrorism, whereas primary/secondary education can increase it; (ii) educational attainment yields increasingly diminishing marginal returns; (iii) the impact of educational attainment depends on the political and economic conditions of the country. I derive hypotheses based on these propositions, and test them empirically by running a series of negative binomial regressions on a large panel of countries.

Supporting the findings of Brockoff et al. (2015), my results indicate that tertiary attainment exerts a pacifying effect on levels of domestic terrorism in countries where political and economic conditions are favorable. In addition, my paper also extends the findings of Brockoff et al. (2015) in a few key ways. First, I show that among wealthy democratic countries, the relationship between tertiary attainment and domestic terrorism is better modeled by a quadratic specification; that is, at higher levels of tertiary attainment, additional gains yield increasingly diminishing returns. Second, I demonstrate that the pacifying effects of educational attainment do not require countries to have high economic development and robust democratic institutions. Instead, it appears as though the threshold for such pacifying effects is actually probably lower than the one implied by Brockoff et al. (2015).

ÖZET

ERİŞİLEN EĞİTİM SEVİYESİNİN İÇ TERÖRİZM ÜZERİNE ŞARTLI ETKİLERİ

JOHN LEE

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Anahtar Kelimeler: erişilen eğitim seviyesi, iç terörizm, çatışma, şartlı etkiler, azalan etkileşim

Bu tez erişilen eğitim seviyesinin iç terörizme etkisiyle ilgili bir teori geliştirmekte ve geliştirdiği teoriyi test etmektedir. Özellikle, şu üç öneriyi ileri sunuyorum: (i) erişilen eğitim seviyesinin iç terörizme direkt etkisi temel eğitim yılına bağlıdır; örneğin yüksek öğrenim terörizmi azaltırken ilkokul veya lise düzeyindeki eğitim terörizmi yükseltebilir; (ii) erişilen eğitim seviyesinin marjinal getirisi yükselen katsayılarla azalmaktadır; (iii) erişilen eğitim seviyesinin etkisi ülkenin politik ve ekonomik durumlarına bağlıdır. Hitopezlerimi bu öneriler üzerine oluşturdum ve ampirik olarak bir dizi negatif binom regresyonlarıyla geniş bir ülke grubu üzerinde test ettim.

Sonuçlarım Brockoff et al. (2015)'in bulgularını desteklemekte, ekonomik ve siyasi şartların uygun olduğu ülkelerde yüksek öğretime katılımın iç terörizm üzerinde azaltıcı etkisi olduğunu göstermektedir. Ek olarak, çalışmam Brockoff et al. (2015)'in bulgularını bir iki çok önemli noktada geliştirmektedir. İlk olarak, varlıklı demokratik ülkelerde, yüksek öğretim ile iç terörizm arasındaki ilişki kuadratik spesifikasyon modeli ile daha iyi açıklanır; yani, ileri seviyelerdeki yüksek öğrenime katılımın getirileri gittikçe azalmaktadır. İkinci olarak, erişilen eğitim seviyesinin iç terörizmi azaltıcı etkisi ülkelerin yüksek ekonomik gelişimlerine ve sağlam demokratik kurumlarına bağlı değildir. Sonuçlarıma göre, terörü baskılayıcı etkileri olması beklenen bu faktörlerin eşiğinin Brockoff et al. (2015)'in belirttiğinden büyük ihtimalle daha az olduğu gözükmektedir.

ACKNOWLEDGEMENTS

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CHAPTER 1: INTRODUCTION

Why study terrorism? In short, my answers are two-fold: first, it is identified by many as being one of the top concerns of our time; and second, its consequences are severe. In an age where the Internet and mass media have given us virtually instantaneous access to information around the world, a terrorist attack in one place can strike fear into the hearts of those living far away. For instance, since the attacks it sustained on September 11, 2001, the U.S. has been relatively insulated from the recent rise in global terrorist activity. Yet despite this reality, in a recent WSJ/NBC poll, 40% of respondents selected national security and terrorism as the federal government's greatest priorities (Engel 2015). After the recent attacks in France, Belgium, and Turkey, far-right parties in Europe are expanding as voters afraid of terrorism begin resisting the entry of new immigrants (Solomon et al. 2016).

The costs of terrorism have also grown in size. In the year 2014, acts of terror around the world cost about $52.9 billion, according to a report from the Institute for Economics and Peace (Yoon and Tartar 2015). This is about the size of Bulgaria's entire annual GDP, as the authors of the article point out. In addition, terrorist attacks claimed the lives of more than 32,000 people that year (*ibid.*). What is terrorism? What conditions coalesce to produce a fertile ground for terrorist group recruitment? Conversely, what factors discourage or even reduce terrorist activity? Many policymakers and media outlets have argued for years that educational attainment can reduce terrorism; is there any empirical merit to this claim? My thesis attempts to propose and test one possible answer to this last question.

My research question is the following: at the cross-national level, what is the nature of the relationship between educational attainment and domestic terrorism? Does more education really make a difference—and if so, under what conditions? This thesis

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develops and tests a theory about the impact of countrywide educational attainment on incidents of domestic terrorism. In short, I argue that the effects of educational attainment on domestic terrorism are both nonlinear and conditional in nature. First, I do not expect an increase in primary and secondary attainment of X% to have the same impact on domestic terrorism as an equivalent increase of X% in tertiary attainment. In fact, a rise in basic and intermediate levels of education may actually fuel more terrorism whereas gains in tertiary education may reduce it (Hypothesis #1). Second, I argue that the effects of educational attainment are also nonlinear in the sense that higher levels of attainment yield increasingly diminishing returns (Hypothesis #2); for example, a gain in the tertiary attainment rate from 20% to 30% probably has a greater marginal impact than an increase of the same magnitude from 90% to 100%.

Finally, I also argue that the impact of educational attainment on domestic terrorism is dependent on the political and economic conditions of the country (Hypothesis #3). In countries with high economic development and/or democratic institutions, gains in educational attainment are expected to have pacifying effects; in countries that are neither wealthy nor democratic, educational attainment is not expected to reduce levels of such violence. In fact, under such poor structural conditions, rising levels of educational attainment might even exacerbate a country's problems with domestic terrorism. Ultimately, I test my hypotheses by running a series of negative binomial regressions on a cross-national panel dataset.

Given the widespread optimism regarding the supposedly pacifying effects of educational attainment on terrorism, the relative scarcity of macro-level research studying this link is surprising. Most cross-national studies have focused on alternative drivers of terrorism: economic conditions (Abadie 2006; Freytag et al. 2011), regime type (Li 2005), political stability (Kis-Katos et al. 2011), government repression (Kurrild-Klitgaard et al. 2006), and identity-based tensions (Piazza 2006). Many of the foregoing studies do not even include measures of educational attainment (e.g., literacy rates) as statistical controls in their research design. Even fewer still, such as a recent paper by Brockoff et al. (2015), clearly articulate and test hypotheses that specifically tie educational attainment to incidents of terrorism.

Why has the formulation and empirical testing of education-related theories remained less prominent in this cross-national literature? One possibility is that the perceived scholarly value of the enterprise has been undermined by micro-level studies which frequently indicate that individual terrorists are neither poor nor uneducated. For example, Krueger and Maleckova (2003) show that the deceased Hezbollah militants in their sample are actually more likely to have attended secondary school than members of the referent Lebanese population; similarly, Berrebi (2007) reports that Palestinian suicide bombers are much less likely to come from families living in poverty.

However, the fact that Krueger and Maleckova (2003) and Berrebi (2007) selected their sample on the dependent variable limits their ability to generalize their findings (e.g., see Geddes 1990). Moreover, even if terrorists are not necessarily poor and uneducated at the individual level, it does not imply that a country's socioeconomic conditions are totally unrelated to its problems with terrorism. For instance, at the country level, researchers have shown that economic downturns—and not periods of growth—are associated with increases in terrorist activity (Blomberg et al. 2004; Honaker 2004). At first glance, it might seem challenging to reconcile these two apparently contradictory empirical accounts: after all, how can the directional effects of economic factors on terrorism differ depending on the level of analysis? This is an important question vis-à-vis this present paper, because the directional effects of educational attainment might also differ based on the level of analysis examined: i.e., individual (or micro) level and country (or macro) level. For example, although many individual terrorists appear to be better educated (Krueger and Maleckova 2003), countrywide gains in educational attainment might still reduce aggregate levels of such violence.

Bueno de Mesquita (2005) provides an explication of this puzzle via a formal model of a terrorist group's recruitment process. Since terrorist organizations are highly motivated and want to achieve their objectives, they prefer to accept only the best from their pool of willing and interested candidates. Due to this screening effect, one cannot necessarily draw conclusions about the quality of the overall pool of candidates based on the backgrounds of those who are actually chosen. In fact, although actual terrorists may be of a higher socioeconomic status than members of the general population, Mesquita's model predicts that most of the people in the candidate pool are actually quite

poor and less educated. Thus, the implication of this prediction is quite insightful: as socioeconomic conditions improve, highly qualified individuals will have steeper opportunity costs for involvement in terrorism; this shrinks the pool of interested candidates and raises the recruitment costs of terror groups—resulting in a fewer number of terrorist attacks, ceteris paribus.

To recapitulate, although it might be tempting to merely extrapolate findings about the link between education and terrorism from individual-level studies, a more comprehensive study of this relationship at the cross-national level is still warranted. There are many theoretical reasons why educational attainment should reduce incidents of terrorism at the country level. For instance, a highly educated population enjoys better economic opportunities and thus faces greater opportunity costs for complicity in illegal activities; in addition, it is better equipped to articulate political frustrations in nonviolent (and less costly) ways, and resist the propaganda attempts of extremist groups.

This thesis proceeds as follows: in Chapter 2, I briefly survey previous studies that either controlled for the effects of education on terrorism or focused on education as the key explanatory variable. In Chapter 3, I develop my theory regarding the nonlinear conditional effects of educational attainment on domestic terrorism and derive several testable hypotheses. In Chapter 4, I describe my research design; and in Chapter 5, I present my empirical results and analysis. In the last sections, I review the robustness of my results, summarize key findings, and discuss policy implications.

CHAPTER 2: LITERATURE REVIEW

2.1 What is Terrorism?

What is terrorism? While the answer might initially seem obvious, the reality is that terrorism is a contested term. Scholars and practitioners across a range of fields including political science, sociology, law, psychology, philosophy, and even public health have developed different understandings of this term. To manage the scope of this review, I will discuss several key conceptions of terrorism used in the related fields of law, political science, and sociology; subsequently, I will formulate and justify the conception of terrorism that is used within this thesis.

2.1(i) Law

It is probably helpful to begin this discussion with examples of how terrorism is defined by national laws and international organizations; because of their practical function, these definitions are by nature more formulaic, precise, and non-theoretical. For instance, according to the U.S. Federal Penal Code (18 U.S.C. § 2331), an act of "Domestic terrorism" must satisfy the following three conditions (FBI 2016):

1. "Involve acts dangerous to human life that violate federal or state law;"
2. "Appear intended (i) to intimidate or coerce a civilian population; (ii) to influence the policy of a government by intimidation or coercion; or (iii) to affect the conduct of a government by mass destruction, assassination. or kidnapping; and"
3. "Occur primarily within the territorial jurisdiction of the U.S."

Turkey has a definition of terrorism enshrined in its Anti-Terror Law (No. 3713). The definition, which is quite detailed, seems to place a greater emphasis on the state as being a key victim or target of the act. For instance, terrorism is described as an

act that seeks to undermine "the authority of the State" or change "the characteristics of the Republic as specified in the Constitution" (MASAK 2016). The full definition is described below:

> "Terrorism is any kind of act done by one or more persons belonging to an organization with the aim of changing the characteristics of the Republic as specified in the Constitution, its political, legal, social, secular and economic system, damaging the indivisible unity of the State with its territory and nation, endangering the existence of the Turkish State and Republic, weakening or destroying or seizing the authority of the State, eliminating fundamental rights and freedoms, or damaging the internal and external security of the State, public order or general health by means of pressure, force and violence, terror, intimidation, oppression or threat."

Largely due to its diverse membership and size, the United Nations General Assembly has yet to formally adopt a binding definition of terrorism. However, various UN organs have at times issued their own interpretations of the term. In 2004, the UN Security Council unanimously adopted Resolution 1566, which employed the following definition of terrorism (UNSC 2004):

> "…criminal acts, including against civilians, committed with the intent to cause death or serious bodily injury, or taking of hostages, with the purpose to provoke a state of terror in the general public or in a group of persons or particular persons, intimidate a population or compel a government or an international organization to do or to abstain from doing any act, and all other acts which constitute offences within the scope of and as defined in the international conventions and protocols relating to terrorism, are under no circumstances justifiable by considerations of a political, philosophical, ideological, racial, ethnic, religious or other similar nature…"

Another major international entity, the European Union, adopted a legal framework for "combating terrorism" in 2002. According to the EU Council, terrorism is an action that harms individuals and/or property and is motivated by at least one of the following three aims (EU 2002):[1]

1. "seriously intimidating a population, or"

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[1] The actual text of the EU Council decision includes a specific list of attacks against people (e.g., murder, kidnapping, hostage taking) and property (e.g., damaging government factilities) that would, in combination with one of the three motivations, constitute an act of terrorism.

2. "unduly compelling a Government or international organization to perform or abstain from performing any act, or"
3. "seriously destabilizing or destroying the fundamental political, constitutional, economic or social structures of a country or an international organization,"

While differences of course exist among the foregoing definitions, generally speaking, a few key similarities emerge. That is, definitions of terrorism codified in laws and promulgated by international organizations seem to indicate that the term has three key components: first, the acts are aimed at individuals, the state, and/or property; second, the act is aimed at inciting fear and intimidation; third, the act is perpetrated in order to achieve some broader purpose that transcends the specific circumstances of the act itself. For example, perhaps the perpetrator of the act is seeking to influence government policy or effect some sort of social or cultural change.

While a comprehensive survey of legal scholars is impossible, it is worth including a definition formulated by Cherif Bassiouni, a highly cited law professor and author of a textbook on international criminal law. His definition excludes the targeting of civilians, and interestingly, also acknowledges the possibility of state-sponsored terrorism (Bassiouni 2001).

"Terrorism is an ideologically-motivated strategy of internationally proscribed violence designed to inspire terror within a particular segment of a given society in order to achieve a power-outcome or to propagandize a claim or grievance, irrespective of whether its perpetrators are acting for and on behalf of themselves, or on behalf of a state."

2.1(ii) Political Science and Conflict Studies

Quantitative political scientists working with cross-national datasets tend to either explicitly or implicitly adopt the definitions used by the major datasets. For instance, the ITERATE data set, a well-known dataset on transnational terrorist events, defines terrorism as the following: "…the premeditated use, or threat of use, of extra-normal violence or brutality to obtain a political objective through intimidation or fear directed at a large audience" (Burgoon 2006). The phrase "political objectives" encom-

passes "the promotion of religious freedoms, economic equality, income redistribution, nationalism, separatism, ideological ends, nihilism, and issue-specific goals" (*ibid*.).

Similar to the definitions contained in national laws and formulated by legal scholars, the ITERATE definition also emphasizes the harmful act itself and the broader purpose that motivates it (i.e., some "political objective"). However, in one sense, the ITERATE definition is more expansive, because it also includes the mere threat of violence—in addition to the actual perpetration of some violent act. A partial list of the scholars using this dataset—and thus offering at least a tacit endorsement of its definition—include the following: Basuchoudhary and Shughart (2010), Blomberg et al. (2004), Kurrild-Klitgaard et al. (2006), Lai (2007), Li (2005), Li and Schaub (2004), and Piazza (2008b).

While formulaic conceptions of terrorism are certainly useful, other political scientists have contributed to the literature by highlighting the importance of framing. Some scholars, for example, acknowledge that the phenomenon under study can also be called "political violence" (e.g., Crenshaw 1983). One advantage of framing terrorism as political violence is that the latter term is more neutral and carries fewer normative implications. While likely unintended, the use of the term "terrorism" itself confers an implicit form of judgment—that identifies one party as being "morally wrong" (i.e., the perpetrator) whereas the other is "morally right" (i.e., the victim). But perhaps both sides might be "morally wrong"; that is, perhaps in different ways, both sides are "victims" of each other. While civilian casualties are certainly undesirable for most, the reality is that what constitutes an act of terrorism for one party might be viewed as a justified act for another (e.g., it might be perceived by a group as being necessary in its fight for freedom).

2.1(iii) Sociology

Sociologists have also made a valuable contribution to the literature by suggesting that terrorism can be conceptualized as one type of social movement. Beck (2008) argues that Social Movement Theory (SMT) can be used as a theoretical framework to

improve our understanding of terrorism. SMT is organized around three core ideas: the mobilization of resources, the necessity of political opportunities, and the importance of framing (e.g., McAdam et al. 1996). The parallels here are noteworthy. First, as with other (albeit less violent) social movements, terrorism requires a large amount of different resources. In the following excerpt from his article, Beck (2008) described some of these key needs and organizational similarities:

> "…terrorist groups face organizational and resource dilemmas similar to social movements, if not even more acute. In fact, many terrorist groups seem to be structured like modern social movement organizations—a highly professionalized core that directs and manages attacks, assembles resources, and provides overall leadership to a broader base of supporters."

Second, SMT argues that social movements do not emerge in a vacuum. A series of social, economic, and/or political conditions must coalesce to produce a context that is ripe for the emergence of a given movement (McAdam 1982). In a similar sense, a combination of contextual factors can create a climate that is more conducive for terrorist recruitment and operations. For instance, ceteris paribus, terrorist groups are generally better able to recruit members in countries with high unemployment (Honaker 2004), domestic instability (Campos and Gassebner 2009), and severe demographic pressures (Tavares 2004, Burgoon 2006). The emphasis of the SMT on the effect of political opportunities might also help explain how terrorist groups tend to adapt their tactics based on their present context: e.g., when the country's security forces are strong, terrorists might focus more on soft targets (Beck 2008).

Third, SMT also claims that social movements need to package their narratives in a way that will elicit the sympathies of the broader population—a concept called "frame alignment" (Benford and Snow 2000). By carefully framing their messages and managing their public perception, these movements seek to expand their recruitment pools and amass resources. For quite some time, scholars have argued that the media plays a key role in this process (e.g., Gitlin 1980). Similarly, terrorist groups expend a great deal of effort in crafting and projecting its message to its target audiences: potential recruits, the mass public, and the state apparatus itself. To support their narratives, these groups also often choose symbolic targets, including government buildings and specific individuals.

2.2 Empirical Findings

As discussed in the previous section, different scholars across a range of fields have for good reasons chosen to define terrorism in different ways. Although I prefer the more neutral phrase "political violence"—which carries fewer normative implications—I have decided to continue using the word "terrorism" because much of the relevant empirical literature does so as well. In particular, I adopt the definition of terrorism used by the Global Terrorism Database (GTD), which offers the practical benefit of enabling me to use the dataset. I prefer the GTD dataset over the ITERATE dataset mentioned earlier, because ITERATE only includes transnational incidences of terrorism; moreover, the GTD is also commonly employed in large-N studies on the subject (e.g., Kis-Katos et al. 2011). According to the GTD, a terrorist attack is an event that involves "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" (START 2015).

To date, there are about a dozen cross-national studies that have examined the effects of educational attainment on terrorism either directly (i.e., as the key explanatory variable) or indirectly (i.e., as a control). Taken as a whole, the results appear to be largely inconsistent and contradictory. For instance, Azam and Thelen (2008, 2010) find that educational attainment has a statistically significant negative or pacifying effect on terrorism. In contrast, Tavares (2004) reports that increasing levels of education might actually be linked to more terrorism (see also, e.g., Testas 2004; Urdal 2006). Finally, a third group of scholars do not find any statistically robust links between country-wide levels of education and incidents of terrorism (e.g., Drakos and Gofas 2006a; Krueger and Maleckova 2003; Kurrild-Klitgaard et al. 2006).

Upon a closer examination, it appears as though these discrepancies are largely due to a fusion of several factors rooted in research design. First, the foregoing studies use three different types of terrorism counts as their dependent variable: the number of domestic terrorism incidents (e.g., Brockoff et al. 2015), the number of transnational

terrorism incidents produced (e.g., Azam and Thelen 2008), and the number of transnational terrorism incidents experienced (e.g., Drakos and Gofas 2006a). Even if the same measure of educational attainment had been used in all of these studies, it is easy to see that the usage of a different type of terrorism count could produce incongruent outcomes. The theorized causal effects of educational attainment are heavily contingent upon the specific nature of the terrorist event.

For example, in a given country, high educational attainment may decrease the number of domestic terrorism incidents by improving economic opportunity and alleviating inequality. Perhaps for a similar reason, the number of transnational attacks originating from the same country might also decrease. However, it is difficult to see why a rise in the education levels of the *target* country would make it less vulnerable to transnational attacks emanating from a different country. As such, it is probably not a coincidence that studies reporting statistically positive links between education and terrorism often selected as their dependent variable the number of transnational terrorism incidents experienced (e.g., Testas 2004).

Second, these empirical discrepancies could also be due to how educational attainment was operationalized. After all, even if all of the studies had chosen the same type of terrorism count—e.g., domestic incidents of terrorism—it is possible for education proxy A to exert a different effect than education proxies B or C. Again, the diversity here is worth noting. For example, Azam and Thelen (2008, 2010) used gross secondary attainment rates; Testas (2004) used tertiary or university attainment rates; Urdal (2006) used tertiary education growth; Kurrild-Klitgaard et al. (2006) used the UNDP education index; and Tavares (2004) used adult male illiteracy rates.

In sum, the existing body of literature concerning the link between educational and domestic terrorism remains inconclusive; as such, there are still very real opportunities to improve our knowledge of this research area. In this thesis I argue that the country-level effects of educational attainment on domestic terrorism are shaped by key contextual factors: i.e., a country's political and economic conditions. Only Blomberg and Hess (2008), Brockoff et al. (2015), and Urdal (2006) explicitly consider the possibility that the link between educational attainment and terrorism is itself shaped by an

intervening variable. Many of the other studies at least implicitly assume that educational attainment shares a simple linear relationship with incidents of terrorism. However, this assumption is problematic for theoretical reasons.

For instance, one might expect a high rate of tertiary attainment to reduce terrorism by increasing the economic opportunity costs of involvement in illegal activities. However, this prediction implicitly depends on whether higher educational attainment will actually generate improved economic outcomes at the macro level—which might not necessarily be the case for a variety of reasons (e.g., an economic downturn, chronic corruption). Similarly, a more educated population will probably be better equipped to participate in the political process, which may decrease support for terrorism by opening alternative means of voicing dissent. However, this chain of logic presupposes that such participation is legal and meaningful in the first place.

Since Brockoff et al. (2015) specifically develop and test hypotheses about the conditional effects of educational attainment on domestic terrorism, it warrants a brief discussion here. After my review of this study, I explain how I plan to build on their work and further refine our knowledge of the relationship between educational attainment and domestic terrorism. The key innovation of Brockoff et al. (2015) was their usage of a two-step cluster analysis, which allowed the authors to test whether the effects of educational attainment are shaped by a country's political, socioeconomic, and demographic conditions. First, they divided their sample of 133 countries (1984-2007) into two groups based on a range of country-specific characteristics (e.g., economic growth, inflation level, rule of law, corruption); then, they ran separate regressions on each cluster.

According to their results, additional years of schooling do indeed have divergent effects on incidents of domestic terrorism based on the quality of each cluster: in countries where structural conditions are favorable (e.g., better economic development and the rule of law), increases in tertiary attainment reduce levels of domestic terrorism; on the other hand, in countries where structural conditions are less ideal (e.g., low respect for property rights), rising levels of primary attainment actually seem to exacerbate domestic terrorism.

While Brockoff et al. (2015) offer some empirical evidence that the impact of educational attainment on domestic terrorism is itself determined by country-specific factors, a key limitation of their research design is its inability to explain specifically why. Brockoff and her coauthors used twelve variables in their cluster analysis to assign each country to one of the two groups.[2] Do all twelve play an equal role in shaping the effects of educational attainment on incidents of domestic terrorism? Alternatively, is it mostly law and order? Or, is it a combination of urbanization, property rights, and economic growth? Which factors play the deciding role in determining whether additional years of schooling will promote or reduce domestic terrorism?

My thesis attempts to fill this gap in the literature by developing and testing hypotheses that predict how *specific* factors determine the nature of the link between educational attainment and domestic terrorism: e.g., is a high level of economic development by itself sufficient to produce conditions in which educational attainment will exert a pacifying effect on domestic terrorism? Moreover, I also attempt to build upon existing studies by empirically testing whether educational attainment yields diminishing marginal returns (i.e., via the use of a quadratic specification); to the best of my knowledge, this has yet to be tested in the large-N cross-national terrorism literature.

The scope of my investigation is limited to domestic incidents of terror—i.e., attacks perpetrated by actors inside their country of origin—for two reasons. First, educational attainment is theorized to be more robustly tied to the production of domestic perpetrators and incidents; in contrast, research shows that transnational terrorist attacks are often likely to be driven by concerns tied to foreign policy, ideology, or economic integration (e.g., Piazza 2008a). Second, domestic incidents of terrorism account for the vast majority of terrorist incidents around the world; in fact, they outnumber transnational attacks by a scale of 4:1 (Enders et al. 2011).

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[2] The full list of variables used by Brockoff et al. (2015) to assign countries to either one of the two clusters included: law and order, corruption, government size, physical integrity, population density, population growth, urbanization, GDP per capita, economic growth, property rights protection, inflation, and female labor participation.

CHAPTER 3: THEORY AND HYPOTHESES

In this section, I briefly review Lee's (2011) theory of violent and nonviolent participation in politics. By extending Lee's model, I derive propositions and testable hypotheses about the expected empirical link between educational attainment and domestic terrorism at the country level. According to Lee, the individual-level decision to engage in terrorism is modeled by a two-step process. First, individuals must decide to participate in the political process at all; second, they must decide whether they will do so peacefully or via the use of violent and illegal means. Significantly, distinct cost structures are expected to be more salient at different stages of the decision-making process.

Individuals deciding whether to participate as political activists must first overcome initial "entry costs" such as possessing a certain minimum standard of information and resources. Those who are unable to meet this threshold are unlikely to participate simply because they lack sufficient information (e.g., due to illiteracy or weak social networks); alternatively, they may also lack disposable income and time due to their low socioeconomic status. People who do overcome these initial barriers and choose to get involved must then decide whether the expected benefits of violent activism outweigh its high costs (i.e., relative to peaceful activism, which is less risky).

Using colonial era data from the Indian province of Bengal, Lee offers some empirical support for his model. He shows that while Bengali terrorists were from higher socioeconomic backgrounds than members of the general population, they were less educated and less wealthy compared to *non-violent* political activists. One plausible implication of this finding is that the relationship between socioeconomic status and involvement in terrorism can be modeled by an inverted U-shaped curve. Until socioeconomic status hits an upper threshold, marginal gains may actually *increase* the like-

lihood of involvement in terrorism (i.e., as well as all forms of political activism); however, after socioeconomic status hits this upper threshold, subsequent increases in education or income may deter many political activists from engaging in violence—because the opportunity costs of doing so become intolerably expensive.

Based on the foregoing discussion, I formulate a theory about the impact of educational attainment on domestic terrorism at the cross-national level of analysis. In short, country-wide gains in education shape aggregate trends in all manifestations of political participation. By creating macro-level conditions that are more conducive to either peaceful or violent forms of such activism, educational attainment may materially affect the prevalence of domestic terrorism in a country. In the coming sections I explain why educational attainment might specifically exert both a nonlinear and conditional effect on incidents of domestic terrorism.

3.1 Proposition #1: Nonlinear Relationship

As indicated in the introduction of this paper, I argue that country levels of educational attainment should share a nonlinear relationship with incidents of domestic terrorism. I mean this in two different senses. First, I do not expect an X% national increase in primary and secondary attainment to have the same impact on domestic terrorism as an equivalent increase of X% in tertiary attainment. In fact, a rise in basic and intermediate levels of education may actually fuel more terrorism whereas gains in tertiary education may reduce it. While this might initially seem counterintuitive, there are compelling reasons to believe that the effect of each additional year of schooling depends upon the base year.

The political behavior literature broadly attests to the strength of the link between education and various forms of political knowledge, interest, and participation (e.g., Dee 2004; Grönlund and Milner 2006; Milligan et al. 2004). For example, using randomized experiments—the gold standard of research design—Sondheimer and Green (2010) show convincingly that high school graduation rates can boost voter turnout. Other studies based on natural experiments have suggested that education may in-

directly promote political participation (Berinsky and Lenz 2011). In sum, generally speaking, citizens who are better educated are more likely to be meaningfully engaged in the political process. Even if the public masses do not formally lack access to political information (e.g., due to a state policy of censorship), processing it often requires a certain sophistication that is associated with literacy and higher levels of education.

However, as Berrebi (2007) observes, better educated people are also more likely to be cognizant of social, cultural, or economic injustices. Educational attainment can also lead people to develop "a sense of social responsibility and civic engagement" (*ibid*.). Thus, an increased awareness of societal grievances in combination with a heightened desire to respond may lead citizens to get involved in more radical forms of political activism. As such, when countries experience a rise in basic and intermediate levels of education (i.e., primary and secondary), I expect them to experience a surge in all manifestations of political activism, including incidents of domestic terrorism. As Lee (2011) argues, engagement in acts of domestic terrorism is also one type of political participation or activism, albeit a violent and illegal one.

On the other hand, an increase of the same magnitude in the country-wide attainment of *higher* education is expected to be associated with a net reduction in domestic terrorism. As educational attainment rises beyond the secondary level, citizens on average have access to increasingly better jobs and opportunities for upward socioeconomic mobility. Under such conditions, the average pool of terrorists may contract, as more potential recruits face prohibitively steep opportunity costs for engaging in such violence (Bueno de Mesquita 2005). Since most governments vigilantly prosecute and severely punish terrorists, those with progressively rising social statuses have much to lose by participating in illegal activity. This aggregate decline in both the number and quality of interested candidates raises the recruitment costs of terror groups, which can reduce the number of terrorist attacks at the country level.

Given the initial entry barriers inherent in the individual-level decision to participate in political activism, Proposition 1 states that educational attainment shares a nonlinear relationship with domestic terrorism at the country level. Specifically, I expect the relationship to resemble an inverted U-shaped curve. The idea that two varia-

bles might share such a U-shaped relationship is not my original invention, of course. Such a relationship has been empirically observed in a diverse range of fields including economics (Kuznets 1955), public health (Blanchflower and Oswald 2008), occupational psychology (Clark et al. 1996), and even environmental science (Andreoni and Levinson 2001). The central idea behind my first proposition is illustrated in Figure 1:

Figure 1

Expected U-Shaped Relationship Between Educational Attainment and Domestic Terrorism (not to-scale)[3]
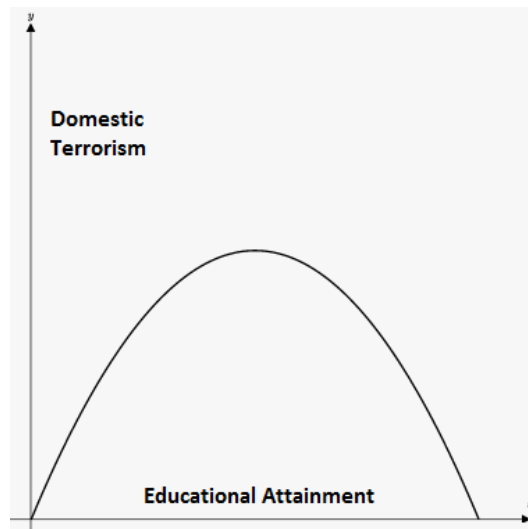
From Proposition #1, I derive my first testable hypothesis:

> <u>Hypothesis 1</u>: Whereas gains in the attainment of basic and intermediate education will increase incidents of domestic terrorism, gains in the attainment of higher education will reduce incidents of domestic terrorism.

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[3] This graph was generated using the free online graphing tool at www.emathhelp.net/

3.2 Proposition #2: Diminishing Marginal Returns

Second, I suggest that the effects of educational attainment are also nonlinear in the sense that it yields increasingly diminishing returns at higher levels. For example, a gain in the tertiary attainment rate from 20% to 30% probably has a greater marginal impact than an increase of the same magnitude from 90% to 100%. There are theoretical reasons for this. When a country's educational attainment rates are relatively low, subsequent gains will boost a nation's stock of human capital, promoting economic growth and job creation. However, when attainment rates are already high, further gains might generate increasingly diminishing macroeconomic benefits. That is, in countries where the vast majority of adults graduate from high school, high school diplomas are worth less on the job market; similarly, college degrees are also less valuable in the job markets of countries with very high levels of post-secondary educational attainment (e.g., college degree).

Sociologists of education have written about this phenomenon for some time. In fact, there is even a term for it: "credential inflation" (e.g., Brown 2001; Collins 2002). As Van de Werfhorst and Andersen (2005) observe, the broad expansion of educational attainment within a society tends to increase the entry-level qualifications in the labor market; e.g., certain jobs that had only required high school diplomas in the past now require applicants to hold a bachelor's degree. Economists have studied the implications of these trends at the macro-level. For example, in a cross-national study, Krueger and Lindahl (2001) find that the effect of educational attainment on economic growth is better modeled by a nonlinear quadratic specification (e.g., also see Trostel 2005).

Accordingly, Proposition 2 states that educational attainment yields increasingly diminishing returns at higher levels. From Proposition 2, I derive my second testable hypothesis:

Hypothesis 2: The impact of basic/intermediate and higher education on domestic terrorism can be modeled by a quadratic specification.

3.3 Proposition #3: Conditional Effects

At the micro level, once individuals overcome the initial entry barriers to political activism, they must now decide whether they want to get involved—and if so, whether to participate peacefully or by using violence (Lee 2011). At this stage, the opportunity costs of engaging in illegal acts such as terrorism become much more salient. However, as I argue in the third part of my theory, the salience of such costs at the country level is itself highly dependent upon a series of mediating factors. For opportunity costs to have a moderating or pacifying effect on terrorist recruitment, they must be perceived by potential terrorists as actually being substantive in nature.

Presumably, there are a number of cases in which macro conditions (e.g., an economic recession) militate against the normally positive link between rises in university attainment and the associated benefits thereof (e.g., better jobs). Under such circumstances, there are fewer reasons to expect a growth in the attainment of higher education to be accompanied by an aggregate decline in domestic terrorism. Specifically, I argue that the pacifying effects of gains in higher education on incidents of domestic terrorism are heavily tied to country-level political and economic factors; this is restated below as Proposition 3: The effects of gains in the attainment of higher education on domestic terrorism are dependent upon country-level political and economic factors.

3.4 Political Conditions

A rise in country-wide tertiary attainment should reduce domestic terrorism because greater numbers of citizens will be equipped to utilize alternative (and less costly) means of voicing grievances. On average, highly educated citizens are better able to engage meaningfully and productively in the political process. For example, in a cross-national study, Grönlund and Milner (2006) demonstrate that education is a key determinant of political knowledge; and Brady et al. (1995) show that key indices of socioeconomic status (e.g., civic skill)—which are correlates of university education—affect the likelihood of participation in non-voting political activities such as volunteering.

However, the pacifying effects of tertiary education are contingent upon whether such opportunities for peaceful engagement actually materialize. In countries where governments are repressive and systematically exclude the public masses from participating, large gains in university attainment may actually foster political violence—as frustrated and increasingly knowledgeable citizens rebel against the state. There is at least some empirical evidence for this claim. Kurrild-Klitgaard et al. (2006) find that democracy is negatively associated with terrorism; similarly, Krueger and Maleckova (2003) report that the protection of civil liberties tends to reduce the production of transnational terrorism. Based on this discussion, I derive the hypothesis below.

Hypothesis 3a: Gains in the attainment of higher education will reduce domestic terrorism among democratic states; among authoritarian states, these gains will either promote domestic terrorism or have no substantial effect in either direction.

3.5 Economic Conditions

When economic conditions are highly unfavorable, marginal gains in higher levels of education (e.g., university) may actually *promote* domestic terrorism. The relative deprivation theory, for instance, suggests that people are more likely to develop grievances if they perceive a gap between what they actually have and what they think they are entitled to (Gurr 1970; Walker and Pettigrew 1984). These grievances may lead to deviant behavior including acts of violence (Kawachia et al. 1999). Increased educational attainment may worsen relative deprivation at the country level if it systematically heightens aspirations while leaving them unfulfilled. This may occur when increases in educational attainment are not accompanied by widespread improvements in living standards or reduced inequalities. For example, Kavanagh (2011) finds that poverty is a positive predictor of participation in Hezbollah only among those with a relatively high educational background.

Progressive gains in educational attainment are unlikely to be followed by a commensurate expansion of economic opportunity when countries are underdeveloped and poor. As such, I derive the following testable hypothesis:

Hypothesis 3b: Gains in the attainment of higher education will reduce domestic terrorism among wealthy states; among poor states, these gains will either promote domestic terrorism or have no substantial effect in either direction.

CHAPTER 4: RESEARCH DESIGN

4.1 Data Collection

In order to test the hypotheses outlined in the previous section, I assembled a dataset of 149 countries for the years 1983-2013.[4] My dependent variable is the number of domestic incidents of terrorism that occurred in a given country and year. For my terrorism data, I will draw on the Global Terrorism Database (GTD), which is a publicly available dataset managed by the National Consortium for the Study of Terrorism at the University of Maryland. The GTD is a comprehensive database, containing information on over 140,000 incidents between 1970 and 2014; it is also employed in many empirical studies on the subject (e.g., Brockoff et al. 2015; Kis-Katos et al. 2011).

The GTD defines a terrorist attack as the intentional use of "violence or immediate threat of violence" by a non-state actor that also meets at least two of the following three conditions (START 2015):

(1) "The act must be aimed at attaining a political, economic, religious, or social goal."
(2) "There must be evidence of an intention to coerce, intimidate, or convey some other message to a larger audience (or audiences) than the immediate victims."
(3) "The action must be outside the context of legitimate warfare activities."

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[4] Country data for my dependent variable (DV) are from the years 1983-2013; however, because I am lagging my independent variables by one year, the country data for my independent variables are from 1982-2012 (see pg. 33 for an explanation on why I lag my IV's).

Unfortunately, the GTD does not include a variable that indicates whether a terrorist event is domestic or transnational. Enders et al. (2011) identify a five-step procedure that can be used to disaggregate the data; however, a quick glance at their replication datasets reveals that their method systematically underestimates the true number of domestic events. For example, incidents that took place in the UK but had victims from Great Britain were often coded as being transnational in nature. Given this issue, I use a slightly modified version of their method in order to identify the domestic events for inclusion in my analysis.[5]

For my key explanatory variables, I use two measures of educational attainment: the sum of primary and secondary enrollment (%), and tertiary enrollment (%). All percentages are gross rates and are drawn from the World Development Indicators (WDI) dataset compiled by the World Bank. I am aware that enrollment and attainment, while conceptually similar, are not necessarily the same: e.g., academic achievement can be lower in areas deeply affected by civil conflict (Kibris 2015). As such, actual completion (or graduation) rates are better indicators of educational attainment than enrollment alone. Unfortunately, the World Bank only has completion data for primary school.

Limited by this practical constraint, and because other scholars have found enrollment to be an acceptable substitute, I will do the same (e.g., Azam and Thelen 2008; Brockoff et al. 2015; Testas 2004). Moreover, a country's enrollment rate is still a useful proxy for educational attainment because it ultimately does tell us something important about the country's level of educational "completion": e.g., if a country's tertiary enrollment rate is 50%, the necessary implication is that at least the students in that 50% group completed some form of secondary education.

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[5] In short, if a terrorist incident met any of the conditions listed below, it was identified as being transnational in nature. If the event met none of these conditions and critical information was not missing (e.g., target type), it was coded as a domestic event: (1) The event location differs from the nationality of at least one of the victims; (2) The perpetrators targeted either a diplomatic mission (e.g., embassy, consulate) or an international NGO (e.g., Red Cross); (3) The perpetrators targeted international organizations (e.g., UN, NATO); (4) The event took place outside of the US but involved American casualties or hostages; (5) A hostage crisis or kidnapping occurred and it involved more than two countries (e.g., the country of resolution differed from where the incident began).

In order to estimate the impact of educational attainment on domestic terrorism, I control for the effects of other factors that are also expected to influence the dependent variable. First, I consider the effects of economic variables by including GDP per capita (logged)[6] and the unemployment rate.[7] GDP per capita (GDP p.c.) is an important measure of a country's relative wealth, development, and economic productivity. Both GDP p.c. and the unemployment rate may shape a country's level of domestic terrorism by altering the aggregate economic cost structure of engaging in illegal activity (Azam and Thelen 2008; Honaker 2004).

Second, a country's political system or regime type is also expected to affect terrorist production. Terrorist groups are more likely to enjoy a fertile ground for recruitment where governments severely repress civil rights and systematically exclude the masses from participating in the political process (Krueger and Laitin 2007; Kurrild-Klitgaard et al. 2006). Conversely, incidents of terror are expected to be negatively associated with inclusive regimes (e.g., such as democracies) that offer meaningful opportunities to express grievances and contribute to the development of public policy (e.g., via peaceful protests, lobbying). To account for these effects, I include a variable based on a country's Polity IV score in a given year.[8]

Third, I control for the effects of political instability and conflict using two variables. They indicate the number of years of domestic and international conflict each country experienced over the previous five years, respectively. Domestic conflict is de-

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[6] GDP per capita is computed in "current US$" to adjust for differences in foreign currency exchange rates across countries and also inflation rates across time. For more information, please refer to the World Bank data page (http://data.worldbank.org/indicator/ NY.GDP.PCAP.CD). GDP per capita is logged because its effect on domestic terrorism likely diminishes after hitting a certain threshold. Many other scholars incorporate the log of GDP per capita as controls in their studies (e.g., Freytag et al. 2010; Gassebner and Luechinger 2011; Kis-Katos et al. 2011; Krueger and Laitin 2008; Li 2005).

[7] If the correlation between GDP per capita and the unemployment rate were high, that would be problematic. However, it is not. A correlation matrix of the variables is included in Appendix III.

[8] I had the option of using a democracy dummy either in the place of, or in addition to, the Polity IV score. However, I decided against this for a few reasons. First, for theoretical reasons, I am interested in understanding whether incremental gains in political liberalism affect the generation of domestic terrorism. I prefer this reframing of the issue because it acknowledges the fact that there are many political regimes that lie between the two extremes of consolidated democracy and absolute monarchy (or autocracy). Second, it would have been inefficient to include both estimators (i.e., the democracy dummy and Polity IV score) due to their covariance. Moreover, the use of the Polity IV Score (i.e., instead of the democratic dummy) is the means of operationalizing political liberalism preferred by many scholars who study this subject (e.g., Brockoff et al. 2015; Kis-Katos et al. 2011; Li and Schaub 2004).

fined as episodes of violence within a country that involve either domestic groups or domestic groups and the state; international conflict denotes periods of violence between the state and another sovereign state. These data are drawn from the Major Episodes of Political Violence (MEPV) dataset managed by the Center for Systemic Peace. Political instability or violent conflict can fuel terrorist recruitment by exacerbating extant intergroup tensions. For instance, Campos and Gassebner (2009) demonstrate that civil wars and guerilla warfare increase the number of transnational terror events. Interstate wars also have a tendency to generate more terrorist activity (Lai 2007; Piazza 2008b).

Finally, I consider demographic factors by controlling for the effects of population (logged) and urbanization.[9] Urbanization is defined as the percentage of the population living in urban areas; these variables are also pulled from the World Development Indicators dataset of the World Bank. I expect both of these factors to be positively associated with domestic terrorism, as large populations and urban centers generate more targets as well as potential recruits, ceteris paribus. These assumptions are supported by previous research. Tavares (2004) finds that urbanization is positively associated with both the number of terrorist attacks and attack-related fatalities; these results are confirmed by Campos and Gassebner (2009). Scholars also note that population size is robustly linked to terrorist production (e.g., Burgoon 2006).

4.2 Statistical Methodology

Standard methods to model discrete count data in the social science literature include Poisson and negative binomial regression analyses (Cameron and Trivedi 1986;

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[9] According to the large-N terrorism literature, logging the population seems to be the standard means of operationalizing this variable. As Li and Schaub (2004) explain, "the size of a country…is logged to control for skewed distribution." Moreover, the relationship between population size and domestic terrorism might be nonlinear in nature: i.e., as the population increases (and moves from low demographic heterogeneity to higher demographic heterogeneity), increases in terrorism may be non-trivial in scale; however, after hitting a certain threshold, additional increases in the population (and heterogeneity) may yield diminished gains in levels of terrorism. The scholars using either a common log or a natural log of the population in their large-N terrorism studies include Azam and Thelen (2010), Brockoff et al. (2015), Burgoon (2006), Freytag et al. (2010), Gassebner and Luechinger (2011), Kis-Katos et al. (2011), Krueger and Laitin (2008), Lai (2007), Li (2005), and Piazza (2011), among many others. Most favor the common log, which is what I use in my study.

Gardner et al. 1995). However, the Poisson model is more restrictive because it assumes that the conditional mean and variance are equal. Since my dependent variable is highly overdispersed (i.e., its variance is substantially larger than its mean), I use the negative binomial model.[10] Given the possibility of serial correlation and heteroskedasticity associated with the use of pooled datasets, estimations are computed using robust standard errors clustered over countries (e.g., see Brockoff et al. 2015; Burgoon 2006). Per standard protocol, I also include a set of dummies for year and region to control for idiosyncratic effects tied to a particular period or area.[11]

Due to the nature of my study, reverse causality is a possible issue. The volume of terrorist incidents may influence future educational attainment, economic performance, or the quality of political institutions. To reduce the correlation between my parameters and the error term, all explanatory variables are either lagged by 1 year (t-1) or presented over a five-year period. However, as Kis-Katos et al. (2011) point out, these controls may be insufficient in countries with a longer history of terrorist activity. In such cases, previous incidents of terrorism may have impacted the lagged explanatory variables as well; additionally, the collective experiences (e.g., skill, reputation) accrued by established terrorist organizations improve their ability to launch future attacks. As an extra control for endogeneity, I thus include the average annual number of total terrorist events over the past five years (i.e., both domestic and transnational). For a correlation matrix of the variables I use in my regression analysis, please refer to Appendix III.

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[10] The negative binomial model is commonly used in this literature. For example, in their review of 31 cross-national terrorism studies published between 1998 and 2010, Krieger and Meierrieks (2011) find that a majority of the studies used the negative binomial model.

[11] Americas, Asia, Europe, Middle East and North Africa (MENA), and Sub-Saharan Africa.

CHAPTER 5: RESULTS AND ANALYSIS

Table 1 displays my six baseline models based on the full sample of countries.[12] In accord with previous cross-national studies, I find that unemployment, domestic conflict, and a recent history of terrorist activity emerge as consistent and statistically significant predictors of increased domestic terrorism (e.g., Honaker 2004; Kis-Katos et al. 2011). In particular, the substantive effect of domestic conflict is fairly high. Countries that have experienced domestic conflict over the previous five years can expect to experience about 1.7 more incidents of domestic terrorism per year, ceteris paribus. Larger populations are also expected to boost terrorist activity, confirming the findings of Burgoon (2006) and others.

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[12] In Chapter 5, I report the normal (i.e., unadjusted) coefficients of my regression models. Alternatively, I could have chosen to report incident rate ratios (IRR's), which generally make the substantive results for count models easier to interpret. However, I decided against this because my count models are nonlinear—and thus the results are actually much more difficult to interpret if IRR's are reported. Moreover, the vast majority of scholars working in the large-N terrorism literature prefer normal coefficients over IRR's when reporting results for their count models. In fact, I reviewed 26 large-N terrorism studies based on count models, and only 2 of them reported IRR's; the rest preferred the use of normal unadjusted coefficients. In any case, although I report normal coefficients in the main part of my paper, I provide another version of Table 1 (baseline models) with IRR's in Appendix IV.

Table 1

Baseline Models (full sample)

Full Sample	(1)	(2)	(3)	(4)	(5)	(6)
Pri. and Sec. % (PS)	2.0×10^{-5} (.0036)	.0188 (.0101)*			-8.2×10^{-5} (.0043)	.0179 (.0126)
PS^2		-6.3×10^{-5} (3.5×10^{-5})*				-6.1×10^{-5} (4.2×10^{-5})
Tert. % (Tert)			-.0033 (.0065)	.0066 (.0167)	-.0059 (.0069)	.0045 (.0166)
Tert^2				-9.7×10^{-5} (.0002)		-8.4×10^{-5} (.0002)
Polity IV Score	.0761 (.0320)**	.0752 (.0319)**	.0677 (.0374)*	.0633 (.0374)*	.0748 (.0350)**	.0675 (.0340)**
GDPpc (logged)	.0976 (.2138)	.1611 (.2113)	.1210 (.2452)	.1116 (.2447)	.1718 (.2422)	.2208 (.2390)
Unemployment %	.0409 (.0132)***	.0391 (.0133)***	.0365 (.0136)***	.0361 (.0135)***	.0452 (.0133)***	.0445 (.0134)***
Population (logged)	1.3017 (.1422)***	1.2981 (.1439)***	1.2782 (.1687)***	1.2680 (.1691)***	1.3653 (.1719)***	1.3474 (.1714)***
Urbanization %	-.0104 (.0066)	-.0088 (.0066)	-.0073 (.0068)	-.0088 (.0073)	-.0086 (.0076)	-.0089 (.0076)
Yrs. Of dom. conf. (past 5)	.3347 (.0512)***	.3369 (.0511)***	.3415 (.0491)***	.3416 (.0493)***	.3373 (.0572)***	.3375 (.0570)***
Yrs. Of intl. conf. (past 5)	.1540 (.0997)	.1419 (.0957)	.1178 (.0938)	.1203 (.0905)	.1532 (.1079)	.1379 (.1046)
Avg. annual no. of terror events (past 5)	.0175 (.0052)***	.0176 (.0052)***	.0174 (.0051)***	.0174 (.0051)***	.0169 (.0057)***	.0172 (.0057)***
No. of countries	145	145	149	149	144	144

Note: Dependant variable is the number of domestic terrorism events per year. Models include a set of dummies for region and year; all parameters are lagged by 1 year (t-1) except for the last three control variables. Robust standard errors are in parentheses: *, **, *** denote statistical significance at the .1, .05, .01 levels, respectively.

Interestingly, politically liberal regimes also appear to be associated with higher rates of domestic terrorism. However, this might be due to a systematic underreporting

bias of incidents among autocracies (Drakos and Gofas 2006b) or a nonlinear connection between political rights and terrorist activity (Abadie 2006).[13]

This first round of analysis fails to support the predictions of Hypothesis 1 (H1), which suggests that gains in the attainment of basic and intermediate education will increase incidents of domestic terrorism, whereas gains in the attainment of higher education will reduce incidents of domestic terrorism. According to the actual data, neither primary and secondary enrollment nor tertiary enrollment bears a statistically significant link with domestic terrorism at all. Moreover, I can reject Hypothesis 2 (H2) for the full sample as well, because the square terms are not significant in any of the models that included them (i.e., Models 2, 4, 6).

However, these results do not necessarily suggest that educational attainment is totally unrelated to the generation of domestic terrorist events in *all* cases. Instead, the relationship between these two variables might actually be quite robust under certain conditions (e.g., given a more homogenous set of countries).[14] According to Hypotheses 3a and 3b, the effects of tertiary enrollment on domestic terrorism are conditioned by the political and economic conditions of the country, respectively. To test these predictions, I use three separate processes to create six subsets of my sample and re-run the full model on each of these smaller and more homogenous groups of countries.

To test Hypothesis 3a, I first find the average Polity IV score of each country for the years 1982-2012. Countries with an average of at least 6 are classified as democracies (subsample #1) while those with an average of -6 and below are identified as autocracies (subsample #2), per the Polity IV coding system. To test Hypothesis 3b, I return to my full sample and create four additional subsamples based on the average

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[13] Using data from Freedom House, Abadie (2006) finds that states with very low political rights and very high political rights are the most vulnerable to terrorist incidents. As Lai (2007) points out, highly democratic states might paradoxically face a greater number of terrorist attacks than less democratic—but not totally autocratic—states because they are less able to use draconian measures to enforce internal security (e.g., due to stronger normative restrictions against the monitoring of citizens and the use of harsh interrogation techniques).

[14] As Elster (1998) observes, aggregate results are often misleading: if statistical analysis on a complete dataset suggests that the relationship between X and Y is either inconsistent or weak, it does not categorically preclude the possibility of a causal relationship between these variables. For instance, these results might suggest that the causal link between X and Y is strong in opposing directions among subsets of the full sample; in such a case, the lack of statistical significance merely manifests the net effect of these two opposing forces/effects.

GDP per capita of the countries for the same period. Those in the top 25% are included in subsample #3 and those in the bottom 25% are included in subsample #4; similarly, countries in the top 20% are included in subsample #5 and those in the bottom 20% are included in subsample #6. The results of this second round of regression analyses are reported in Table 2 below.

Table 2

Models Based on Sample Subsets

Sample Subsets	Political (Polity IV)		Economic (GDP p.c.)			
	Dem. (7)	Auto. (8)	Top 25% (9)	B. 25% (10)	Top 20% (11)	B. 20% (12)
Pri. And Sec. % (PS)	.0717 (.0371)*	-.0572 (.0438)	-.0706 (.0870)	-.0013 (.0205)	.0028 (.0846)	.0171 (.0238)
PS^2	-.0002 (9.6x10^{-5})*	2.5x10^{-4} (1.5x10^{-4})*	.0001 (.0002)	9.3x10^{-6} (8.8x10^{-5})	-7.1x10^{-6} (.0002)	-6.7x10^{-5} (9.7x10^{-5})
Tert. % (Tert)	-.0580 (.0222)***	-.0020 (.0330)	-.0603 (.0304)**	.0048 (.0652)	-.0743 (.0247)***	.1878 (.2031)
Tert^2	.0004 (1.7x10^{-4})**	-.0002 (.0003)	3.6x10^{-4} (2.0x10^{-4})*	-.0007 (.0013)	4.3x10^{-4} (1.6x10^{-4})***	-.0061 (.0077)
Polity IV Score	.1650 (.1443)	-.0027 (.1134)	.1813 (.0911)**	-.0071 (.0517)	.3712 (.1283)***	.0454 (.0579)
GDPpc (logged)	.8190 (.3315)**	-.7930 (.6440)	.6019 (.8395)	-1.2951 (.7930)	-2.0224 (1.1566)*	-1.0137 (.7554)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
No. of countries	53	31	36	36	29	28

Note: Dependant variable is the number of domestic terrorism events per year. All models in Table 2 (7-12) also include other controls from models 1-6 in Table 1: e.g., unemployment, urbanization, population, domestic conflict, etc. Robust standard errors are in parentheses: *, **, *** denote statistical significance at the .1, .05, .01 levels, respectively.

According to the results in Table 2, a country's level of political rights plays a role in shaping the effect of higher educational attainment on domestic terrorism. As predicted by Hypothesis 3a, among democratic nations, gains in tertiary education seem to exert a pacifying effect on domestic terrorist activity (Model 7). The substantive effects are not trivial. For example, democratic states with a tertiary enrollment of 70% can expect to experience 2.1 fewer incidents per year, ceteris paribus. In contrast, there

is little evidence of a similarly consistent and significant pacifying effect of tertiary enrollment among autocratic states (Model 8). Together, these findings lend empirical support to the theory that the effect of gains in tertiary education on domestic terrorism is itself mediated by political conditions within a given country. In countries that protect civil liberties and provide political rights, higher education promotes more peaceful forms of participation in the political process. On the other hand, political repression and exclusion seem to either eliminate or at least militate against this link among more authoritarian states.

The empirical support for Hypothesis 3b is also quite robust, as indicated by Models 9 and 11. As expected, gains in tertiary education reduce domestic terrorism among wealthy countries—and the conditioning effect of economic development seems to be roughly similar to that of a politically liberal regime. Among countries in the top richest quartile by GDP per capita, tertiary enrollment of 70% is expected to generate 2.5 fewer events of domestic terrorism per year. Among countries in the top fifth, however, the drop is even greater—about 3.1 fewer events per year. On the other hand, tertiary enrollment is not predicted to decrease incidents of domestic terrorism among poor countries; in fact, marginal gains may even promote terrorist events, although these effects are not significant at conventional levels (Models 10, 12).

Interestingly, neither economic development nor the provision of political rights appears to have a conditioning effect on the link between basic/intermediate educational attainment and domestic terrorism. According to my theory, as primary and secondary enrollment increases at the country level, citizens are generally more likely to be involved in all forms of political activism. In countries experiencing severe underdevelopment or political repression, an aggregate rise in political activism is expected to promote trends in its more violent forms as well. However, the results of my statistical analysis fail to support this narrative, showing that enrollment in basic/intermediate education is not significantly tied to incidents of domestic terrorism regardless of the country's poor economic or political conditions. Thus, I can reject the second half of Hypothesis 1 (H1) for these more homogenous subsets of countries as well.

According to the second round of regression analyses, Hypothesis 2 (H2) finds some empirical support. Among democratic countries and very wealthy countries (i.e.,

top 20% in GDP per capita), the effects of tertiary enrollment do appear to yield diminishing returns (Models 7, 11). For example, democratic states with a tertiary enrollment rate of 30% experience 1.38 fewer incidences of domestic terrorism per year; those with a tertiary enrollment rate of 40% experience 1.68 fewer events per year. That is, as the tertiary enrollment rises from 30% to 40%, democratic countries benefit from a net reduction of .3 annual incidences of domestic terrorism. However, a gain in the tertiary enrollment rate of the same magnitude between 60% to 70% only yields a net reduction of .06 events per year : i.e., 2.04 fewer events at 60% enrollment versus 2.1 fewer events at 70% enrollment.

Qualitatively, Model 7 suggests that the benefits of tertiary enrollment also generate increasingly diminishing returns among very wealthy countries as well (i.e., those in the top 20% by GDP per capita). Among these very wealthy countries, a rise in the tertiary enrollment between 30% to 40% generates a net reduction of .44 events per year (i.e., 1.84 fewer events at 30% and 2.28 fewer events at 40%); however, a rise in the tertiary enrollment of the same magnitude between 60% to 70% generates a net reduction of only 0.18 (i.e., 2.91 fewer events at 60% and 3.09 fewer events at 70%). On the other hand, among countries that are wealthy but not "very wealthy" (i.e., top 25% in GDP per capita), the square term is only statistically significant at the 90% confidence level. This finding indicates that the link between tertiary enrollment and domestic terrorism for this group is probably better modeled by a linear relationship.

To recapitulate, the empirical results thus far suggest that the effects of educational attainment on incidents of domestic terrorism depend on at least two mediating factors: (1) the base level of education; (2) the structural conditions of the country. First, gains in primary and secondary enrollment do not exert statistically significant effects on a country's level of domestic terrorism. That is, there is little empirical evidence that gains in these lower and intermediate levels of education either increase or reduce a country's risk of domestic terrorism. Second, gains in tertiary enrollment do affect incidents of domestic terrorism—but only when the country's structural conditions are favorable. Moreover, these effects appear to be nonlinear in nature, eventually yielding diminished returns among countries that are democratic, very wealthy, or both.

In an attempt to extend the findings of Brockoff et al. (2015), I will now test whether the pacifying effects of tertiary enrollment require both favorable political conditions *and* favorable economic conditions. In their study, Brockoff et al. (2015) found that the directional effects of tertiary enrollment on domestic terrorism are determined by country-specific factors. Brockoff and her coauthors used twelve variables in their cluster analysis to assign each country to one of the two groups: (i) favorable structural conditions; (ii) unfavorable structural conditions.[15]

As a result of this research design, the scholars in their subsequent analysis were unable to discern precisely *why* a growth of university enrollment would reduce levels of domestic terrorism among countries in the first group. What was the deciding factor? That is, were the conditional effects of tertiary enrollment primarily dependent upon a country's level of political rights or degree of economic development and wealth? Alternatively, do the pacifying effects of university enrollment require both types of contextual factors to be favorable?

In this part of my study, I will seek to test whether gains in tertiary enrollment can reduce levels of domestic terrorism in countries that are wealthy *or* provide political rights and freedoms via a democratic system of governance. In short, I want to understand whether either condition might be sufficient by itself. As predicted by modernization theory, most of the very wealthy countries in the dataset are also democracies. Table 3 below displays all of the countries that fall into either or both of the following two groups based on data between 1982-2012: wealthy (i.e., top 20% by GDP per capita) or democratic.

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[15] Again, the full list of variables used by Brockoff et al. (2015) to assign countries to either one of the two clusters included: law and order, corruption, government size, physical integrity, population density, population growth, urbanization, GDP per capita, economic growth, property rights protection, inflation, and female labor participation.

Table 3

Wealth and/or Democratic Countries by Group (1982-2012)[16]

Wealthy and Democratic (24)	Only Wealthy (4)	Only Democratic (29)
▪ Australia ▪ Austria ▪ Belgium ▪ Canada ▪ Cyprus ▪ Denmark ▪ France ▪ Germany ▪ Greece ▪ Ireland ▪ Israel ▪ Italy ▪ Japan ▪ Lithuania ▪ Luxembourg ▪ Netherlands ▪ New Zealand ▪ Norway ▪ Slovenia ▪ Spain ▪ Sweden ▪ Switzerland ▪ United Kingdom ▪ United States	▪ Bahrain ▪ Kuwait ▪ Qatar ▪ UAE	▪ Argentina ▪ Bolivia ▪ Colombia ▪ Costa Rica ▪ Czech Republic ▪ Dominican Republic ▪ Ecuador ▪ El Salvador ▪ Estonia ▪ Finland ▪ Honduras ▪ India ▪ Jamaica ▪ Latvia ▪ Macedonia ▪ Mauritius ▪ Moldova ▪ Namibia ▪ Peru ▪ Portugal ▪ Serbia ▪ South Africa ▪ Timor-Leste ▪ Trinidad and Tobago ▪ Turkey ▪ Ukraine ▪ Uruguay ▪ Venezuela

As Table 3 indicates, there is a great deal of overlap between the countries in subsample #1 (democracies) and the countries in subsample #5 (top 20%, based on GDP per capita). In fact, there are 24 countries that fit both categories: i.e., the coun-

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[16] Countries were categorized based on average Polity IV scores and GDP per capita over the period 1982-2012. Countries are listed in alphabetical order for each column.

tries in column one of Table 3 are generally wealthy consolidated democracies. Thus, the regression models in Table 2 should not be used to test whether the pacifying effects of tertiary education require both political and economic conditions to be favorable. To test this claim, I need to devise a means of creating two groups of nations that do not overlap with each other.

In an ideal world, I would create two groups of countries that represent extremes on both the political and economic continuums: i.e., (A) very poor highly democratic countries and (B) very rich dictatorships. Unfortunately, for a large-N quantitative study, such a classification system is difficult because the sample size is too small—especially in the case of Group A (i.e., India). As such, I settled on the following more practical classification system: (A) democratic but not wealthy, and (B) non-democratic and high/middle income. For the purposes of my study, the groups I have chosen are ultimately sufficient because they still identify groups of nations that are not rich and democratic at the same time. Moreover, after describing how I create these two groups, I show that these groups are substantially different from each other—in terms of both economic development and degree of "democraticness."

To create Group A ("democratic but not wealthy"), I return to my full sample. Countries placed in Group A satisfy two conditions. First, they must on average have passed the minimum threshold for being a democracy for the years 1982-2012: that is, the 30-year average of their Polity IV scores must meet or exceed 8 on the adjusted Polity IV scale of 0 to 10.[17] Second, they must not be classified as a "high-income country" by the World Bank.[18] Countries in Group B ("non-democratic and high/middle income") must meet the following conditions. First, they must on average have been categorized as either a "closed anocracy" or "autocracy" between 1982-2012: that is, the 30-year average of their Polity IV scores must be at or below 5 on the adjusted Pol-

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[17] Polity IV scores were rescaled from the original -10 to 10 scale to an adjusted 0 to 10 scale. The purpose of the adjustment was to make it easier to interpret the results of the regression analyses. Again, GDP per capita is measured in "current US$" to control for differences in foreign currency exchange rates and inflation across time.

[18] The World Bank uses the "Atlas method" to compute the Gross National Income (GNI) per capita of each country. For the 2016 fiscal year, a country with a GNI per capita above $12,736 (US$) is considered to be a part of the high-income group.

ity IV scale of 0 to 10. Second, they must be classified as either a "upper-middle-income country" or a "high-income country" by the World Bank.[19]

Groups A and B contain very different sets of nations. In fact, there is no overlap between these two groups (i.e., there is no country that is in both groups). The overall average GDP per capita for all countries between 1982-2012 was $7,698, and the overall average Polity Score for the same period was 6.2 (i.e., on an adjusted scale between 0-10). However, the countries in Group A are substantially poorer (average GDP per capita: $2,593) but far more democratic (rescaled Polity score: 8.8). Conversely, the countries in Group B are significantly more wealthy (average GDP per capita: $12,277) but far more politically repressive and autocratic (rescaled Polity score: 1.9). Table 3 presents a list of the countries in each group.

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[19] For the 2016 fiscal year, upper-middle-income countries were those with a GNI per capita between $4,126 to $12,735; high-income countries were those with a GNI per capita above $12,736 (US$).

Table 4

Countries in Groups A and B

Group A: Democratic but not Wealthy (20)	Group B: Non-Democratic with High/Medium Income (13)
▪ Bolivia ▪ Botswana ▪ Colombia ▪ Costa Rica ▪ Dominican Republic ▪ Ecuador ▪ El Salvador ▪ Honduras ▪ India ▪ Jamaica ▪ Macedonia ▪ Mauritius ▪ Moldova ▪ Namibia ▪ Peru ▪ Serbia ▪ South Africa ▪ Timor-Leste ▪ Turkey ▪ Ukraine	▪ Algeria ▪ Bahrain ▪ Cuba ▪ Gabon ▪ Iran ▪ Jordan ▪ Kazakhstan ▪ Kuwait ▪ Libya ▪ Qatar ▪ Saudi Arabia ▪ Tunisia ▪ UAE

Table 5 below presents the regression analyses on these two final subsets of the sample: Group A (Democratic but not Wealthy) and Group B (Non-Democratic with High/Medium Income). Further supporting the results of previous analyses, primary and secondary levels of enrollment do not seem to be tied to the levels of domestic terrorism in a country. Interestingly, tertiary education does exert a significant pacifying effect among the countries in Group A (Democratic but not Wealthy) but not among those in Group B (Non-Democratic with High/Medium Income). For instance, the results of Model 13 suggest that the countries in Group A with a tertiary enrollment rate of 70% can expect to experience about 4.5 fewer incidents of domestic terrorism per year, ceteris paribus.

Moreover, Hypothesis 2 also finds support among the countries in Group A, as Model 13 suggests that the pacifying effects of tertiary enrollment begin to diminish at higher levels. For instance, countries in Group A with a tertiary enrollment rate of 30% experience 3.14 fewer incidences of domestic terrorism per year; those with a tertiary enrollment rate of 40% experience 3.78 fewer events per year. That is, as tertiary enrollment rises from 30% to 40%, these countries benefit from a net reduction of .64 annual incidences of domestic terrorism. However, a gain in the tertiary enrollment rate of the same magnitude between 60% to 70% only yields a net reduction of .04 events per year : i.e., 4.48 fewer events at 60% enrollment versus 4.52 fewer events at 70% enrollment.

Table 5

Models Based on Sample Subsets (A and B)

Sample Subsets	Group A (Model 13)	Group B (Model 14)
Pri. And Sec. % (PS)	.0161 (.0888)	-.0114 (.2398)
PS^2	2.3×10^{-5} (.0003)	.0002 (.0006)
Tert. % (Tert)	-.1346 (.0410)***	.3229 (.2672)
Tert^2	.0010 (.0004)**	-.0068 (.0040)*
Polity IV Score	-.2179 (.1761)	.0654 (.1556)
GDPpc (logged)	-.1557 (.9358)	5.0196 (2.3231)**
Other controls	Yes	Yes
No. of countries	20	13

Note: Dependant variable is the number of domestic terrorism events per year. Both models in Table 5 (13 and 14) also include other controls from models 1-12 in Tables 1 and 2: e.g., unemployment, urbanization, population, domestic conflict, etc. Robust standard errors are in parentheses: *, **, *** denote statistical significance at the .1, .05, .01 levels, respectively.

These findings are noteworthy for a few reasons. First, they offer some initial empirical evidence that the pacifying effects of tertiary education on domestic terrorism

do not necessarily require countries to possess both high levels of economic development *and* high degrees of "democraticness." Specifically, a democratic form of governance may provide a sufficiently favorable context, even in the absence of great economic wealth. In fact, this finding is particularly surprising because as previously noted, the countries in Group A are substantially poorer than the average country in the full sample: i.e., the overall average GDP per capita for all countries between 1982-2012 was $7,698—compared to a mere $2,593 for the countries in Group A.

On the other hand, Model 14 indicates that even in the presence of medium to high economic development, the lack of democratic political institutions may eliminate the pacifying effects of tertiary enrollment. The countries in Group B are significantly more wealthy (i.e., with a 30-year average GDP per capita of $12,277). However, they are also significantly more repressive and autocratic—having an average (rescaled) Polity score of 1.9, compared to the overall average of 6.2, and Group A's average of 8.8.

Thus, this present study extends the findings of Brockoff et al. (2015), which suggested that the effects of advances in education are dependent upon a country's "socioeconomic, politico-institutional, and demographic conditions." Due to their research design, Brockoff and her coauthors were unable to empirically disentangle the intervening effects of political and economic variables. Thus, it was unclear which specific factors were driving their finding that tertiary education exerts pacifying effects under "favorable structural conditions." According to the results in Table 5, the pacifying effects of tertiary enrollment probably do not require a structural context as favorable as the one implied by Brockoff et al. (2015). In fact, a majority of the countries in Group A (Table 4) had actually been identified by the aforementioned authors as belonging to the "Subsample of Less Developed Nations" (i.e., the group with less favorable structural conditions).

Finally, another contribution of this paper is to help clarify the minimum threshold of "democraticness" countries must meet in order to enjoy the pacifying effects of tertiary enrollment. A quick glance at Table 4 indicates that the countries in Group A are probably not what most scholars would consider to be consolidated (i.e., mature or

"liberal") democracies.[20] However, within the context of this study, the choice to use "illiberal" or partial democracies is arguably more empirically valuable. If the regression analysis had been performed on a hypothetical group of poor consolidated democracies, the results might only be applicable to poor *consolidated* democracies; instead, the actual results (Model 13) suggests that tertiary enrollment can have pacifying effects even in countries that do not have fully mature democratic institutions and cultures.

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[20] To reiterate, I was not able to put together a group of truly poor liberal democracies due to issues of sample size.

CHAPTER 6: ROBUSTNESS CHECKS

I examine the robustness of these findings by checking for endogeneity, using an alternative statistical model, using interaction terms, and testing the plausibility of the theorized transmission channels. First, I check for endogeneity. The problem of endogeneity might be present, for instance, if an omitted variable "X" exerts a causal effect on both my key independent variables (IV) and the dependent variable (DV). Thus, I perform the two-step Hausman test for endogeneity (e.g., Brockoff et al. 2015). In stage one, I estimate a reduced-form equation for each education variable using a set of exogenous regressors; afterwards, I store these residuals. In the second stage, I add these residuals back into my full baseline model. Like Brockoff and her co-authors (2015), I also find that the residuals are not significant, suggesting that the education variables are not affected by the endogeneity problem.

Second, I examine whether my results are robust to an alternative statistical methodology. As previously indicated, most scholars working with large-N cross-national terrorism datasets use the negative binomial model; however, a few have also used the zero-inflated version of this model as a robustness check (e.g., Piazza 2008b). As Drakos and Gofas (2006b) point out, terrorism datasets might suffer from a systematic non-reporting bias among autocracies. That is, a "zero outcome" is due to one of two distinct processes: a country actually did not experience an incident that year, or it went unreported. To account for this possible effect, I run a series of zero-inflated negative binomial (ZINB) regressions. A Polity IV democracy variable is used in the logit part of the model. Like Piazza (2008b) and others scholars, I find that the use of the ZINB estimator generates results that are largely similar to that of the normal negative binomal model. That is, in this case, the ZINB estimator also suggests that educational attainment exerts a nonlinear effect on domestic terrorism—and this effect is mediated

by contextual factors. These results generally support the findings discussed in Chapter 5.

Third, I also test the robustness of my findings regarding the conditional effects of tertiary educational attainment by adding interaction terms to a few new models: one model incorporates an interaction term for tertiary enrollment and GDP per capita (i.e., "tertiary education * GDP per capita"); another model incorporates an interaction term for tertiary enrollment and the Polity score (i.e., "tertiary education * Polity4"). According to the results, the interaction term is not statistically significant in either of the models. However, these results do not necessarily negate the findings discussed in Chapter 5. If the interaction terms had been significant, it would not only have indicated that the effects of tertiary enrollment are shaped by political and economic factors—but also that the effects of political and economic factors are themselves shaped by tertiary enrollment levels.

In other words, empirically, the use of an interaction term implies that the interaction effect goes *both* ways. However, my theory did not suggest that the effects of "democraticness" or economic development on domestic terrorism would be mediated by tertiary enrollment. Instead, my theory only suggested that the effects of tertiary enrollment would be mediated by these political and economic contextual factors. Thus, the better empirical strategy for my specific theory was to do what I did in Chapter 5: i.e., run regressions on more homogenous subsets of countries (e.g., a group of wealthy countries). Perhaps for this reason, Brockoff and her co-authors (2015) also decided not to use interaction terms to test their own conditional effects theory; like me, they tested their theory by running regressions on smaller more homogenous subsamples of countries (e.g., also see Blomberg and Hess 2008). To recapitulate, the interaction terms' lack of statistical significance does not necessarily suggest that the effects of tertiary enrollment on domestic terrorism are divorced from the political and economic conditions of the country; instead, these results might simply indicate that the interaction effects do not go both ways.

Finally, I check whether the assumed transmission channels (i.e., economic opportunity costs) connecting a rise in tertiary education to reduced terrorist activity actu-

ally exist. Tertiary enrollment is indeed positively correlated with GDP per capita. This link also holds when GDP per capita is adjusted for relative purchasing power. Though provisional, these simple tests suggest that the theorized transmission channels are at least plausible. Ideally, I would have also liked to check whether the education variables are indeed associated with various forms of political participation. Unfortunately, to the best of my knowledge, a uniform measure of "political participation" does not exist at the cross-national level of analysis. This is left as an area for future study.

CHAPTER 7: CONCLUSION

Supporting the findings of Brockoff et al. (2015), my analysis suggests that the effects of educational attainment on domestic terrorism are shaped by key political and economic factors. In particular, tertiary enrollment seems to have a pacifying effect on levels of domestic terrorism in countries where structural conditions are favorable. Substantively, these effects are not trivial. Among very wealthy states (i.e., those in the top 20% in GDP per capita), a tertiary enrollment rate of 70% generates about 3.1 fewer incidents of domestic terrorism per year, ceteris paribus; among democratic states, an equivalent rate of tertiary enrollment generates about 2.1 fewer incidents of domestic terrorism per year. Placed within the context of the other findings, the substantive effects of tertiary enrollment among countries with favorable structural conditions are quite significant. For example, countries that have experienced domestic conflict over the past five years can expect to experience about 1.7 more incidents of domestic terrorism per year.

In addition, my thesis also extends the findings of Brockoff et al. (2015) in several key ways. First, I show that among wealthy democratic countries, the relationship between tertiary enrollment and domestic terrorism is better modeled by a quadratic specification; that is, at higher levels of tertiary enrollment, additional gains yield increasingly diminishing returns. For instance, among very wealthy states (Model 11), a rise in the tertiary enrollment between 30% to 40% generates a net reduction of 0.44 events per year (i.e., 1.84 fewer events at 30% and 2.28 fewer events at 40%); however, a rise in the tertiary enrollment of the same magnitude between 60% to 70% generates a net reduction of only 0.18 (i.e., 2.91 fewer events at 60% and 3.09 fewer events at 70%).

Second, I demonstrate that the pacifying effects of educational attainment do not require countries to have both high economic development and robust democratic institutions. Instead, it appears as though the threshold for such pacifying effects is actually probably lower than the one implied by Brockoff et al. (2015). My initial results suggest that democratic countries can benefit from these effects even if they are not wealthy; moreover, these countries do not need to be consolidated democracies with mature democratic institutions (Model 13).

Interestingly, although educational attainment can have pacifying effects among non-wealthy democracies, there does not seem to be such an effect among middle/high-income non-democratic states (Model 14). These results suggest that a country's political regime might play a greater role in mediating the impact of tertiary enrollment on incidents of domestic terrorism than high economic development. This does not, however, imply that economic conditions do not matter at all. Indeed, while the democratic countries in Group A (Model 13) were not wealthy, none were extremely poor either. Thus, a more nuanced interpretation of the findings indicates that the pacifying effects of tertiary enrollment still require countries to reach some minimum threshold of economic development.

Ultimately, these results indicate that widening public access to higher education, while certainly an admirable goal, is by itself far from a full-proof remedy for the problem of domestic terrorism. To optimize the pacifying effects of educational attainment, governments should also implement policies aimed at protecting the political rights of citizens and generating broad economic growth. In countries with democratic institutions and at least moderate levels of economic development, highly educated citizens have incentives and meaningful opportunities to engage peacefully in the political process; moreover, the aggregate economic costs of participation in illicit terrorist activity are much more compelling—and thus more likely to discourage such behavior, ceteris paribus.

Due to some limitations and related data issues, these results should be taken as being subject to future validation. For example, given the implications of my theory, it would have been ideal to test the hypotheses by using the completion rates of key edu-

cational milestones; alternatively, the use of net enrollment rates would also have been preferable to the use of gross rates, which can exceed 100%. Unfortunately, the World Bank does not publish completion data for educational milestones beyond primary school; nor does it publish data for net tertiary enrollment. In addition, as is usually the case with this kind of research, the presence of missing data was also a challenge. With these issues in mind, I certainly invite attempts to further test or extend my findings via the use of improved datasets, alternative parameters, and different statistical models.

For instance, areas for future research include investigating other country-level factors that may play a role in shaping the impact of educational attainment on various forms of political violence. Educational content is one example. In countries where the educational curriculum teaches material that antagonizes certain groups based on ethnic, religious, or political identities, more time in such a system may actually aggravate intergroup tensions—leading to greater participation in domestic acts of terrorism.

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Appendix A: Number of Domestic Terrorist Events by Country (1983-2013)

Country	Number		Country	Number
Albania	56		Lebanon	704
Algeria	1960		Lesotho	12
Angola	346		Liberia	17
Argentina	378		Libya	250
Armenia	14		Lithuania	4
Australia	30		Luxembourg	12
Austria	31		Macedonia	87
Azerbaijan	36		Madagascar	19
Bahrain	94		Malawi	3
Bangladesh	770		Malaysia	42
Belarus	7		Mali	65
Belgium	44		Mauritania	6
Benin	7		Mauritius	2
Bhutan	5		Mexico	255
Bolivia	184		Moldova	7
Botswana	7		Morocco	11
Bulgaria	37		Mozambique	166
Burkina Faso	4		Namibia	75
Burundi	314		Nepal	745
Cambodia	174		Netherlands	40
Cameroon	19		New Zealand	9
Canada	39		Nicaragua	633
Central African Republic	38		Niger	37
Chad	20		Nigeria	1216
Chile	1896		Norway	6
China	150		Pakistan	7529
Colombia	5448		Panama	84
Comoros	5		Papua New Guinea	52
Congo, Dem. Rep.	144		Paraguay	44
Congo, Rep.	12		Peru	4693
Costa Rica	10		Philippines	3059
Cote d'Ivoire	33		Poland	23
Croatia	17		Portugal	28
Cuba	24		Qatar	2
Cyprus	65		Romania	2
Czech Republic	15		Russian Federation	1627
Denmark	12		Rwanda	114

Dominican Republic	64		Saudi Arabia	34
Ecuador	135		Senegal	76
Egypt	673		Serbia	7
El Salvador	1852		Sierra Leone	50
Equatorial Guinea	2		Singapore	3
Eritrea	7		Slovakia	13
Estonia	7		Slovenia	4
Ethiopia	44		South Africa	1528
Fiji	13		South Korea	17
Finland	4		Spain	1492
France	1539		Sri Lanka	2059
Gabon	3		Sudan	135
Gambia	3		Suriname	38
Georgia	144		Swaziland	13
Germany	238		Sweden	30
Ghana	16		Switzerland	25
Greece	674		Syria	325
Guatemala	551		Tajikistan	98
Guinea	17		Tanzania	14
Guinea-Bissau	7		Thailand	2103
Guyana	16		Timor-Leste	6
Honduras	150		Togo	40
Hungary	33		Trinidad and Tobago	15
India	7102		Tunisia	23
Indonesia	502		Turkey	1760
Iran	186		Uganda	225
Ireland	106		Ukraine	43
Israel	1079		United Arab Emirates	4
Italy	210		United Kingdom	2143
Jamaica	9		United States	714
Japan	253		Uruguay	25
Jordan	24		Uzbekistan	13
Kazakhstan	18		Venezuela	143
Kenya	256		Vietnam	5
Kuwait	30		Yemen	715
Kyrgyzstan	16		Zambia	45
Laos	12		Zimbabwe	48
Latvia	10			

Source: Global Terrorism Database (GTD), National Consortium for the Study of Terrorism and Responses to Terrorism, University of Maryland

Appendix B: Summary Statistics

Variable	Mean	Median	SD	Min	Max
Dom. Terror Event	15.16	0	63.77	0	1742
Primary and Sec. Enrollment (Gross %, combined)	166.82	180.13	43.75	23.02	266.55
Tertiary Enrollment (Gross %)	26.09	20.19	23.54	.08	117.89
Polity IV Score (0-10)	6.21	7.5	3.54	0	10
GDP per capita (logged)	3.34	3.26	.72	1.81	5.06
Unemployment (%)	8.61	7.2	6.13	0	39.3
Population (logged)	6.97	6.95	.67	5.40	9.13
Urbanization (%)	52.07	52.58	23.88	4.67	100
Years of Domestic Conflict (past 5)	.95	0	1.81	0	5
Years of International Conflict (past 5)	.14	0	.70	0	5
Avg. Annual Number of Terrorist Events (past 5)	14.65	1	46.76	0	823.2

Sources: Global Terrorism Database (GTD), World Development Indicators (World Bank), Polity IV Project (Center for Systemic Peace), Major Episodes of Political Violence (MEPV) dataset (Center for Systemic Peace)

Appendix C: Correlation Matrix

	PS	Tert.	P. 4	GDP	Unemp.	Pop.	Urban.	DC (p5)	IC (p5)	Avg. TE (p5)
PS	1.00									
Tert.	0.69	1.00								
P. 4	0.46	0.51	1.00							
GDPpc	0.73	0.75	0.55	1.00						
Unemp.	-0.04	-0.06	-0.02	-0.12	1.00					
Pop.	-0.02	0.07	-0.01	-0.05	-0.21	1.00				
Urban.	0.70	0.69	0.41	0.81	-0.02	-0.02	1.00			
Yrs. DC (past 5)	-0.25	-0.24	-0.16	-0.29	-0.05	0.36	-0.23	1.00		
Yrs. IC (past 5)	-0.08	0.00	-0.07	-0.09	-0.05	0.10	-0.06	0.15	1.00	
Avg. #T/E (past 5)	-0.01	-0.05	0.06	-0.04	0.00	0.32	0.00	0.49	0.01	1.00

Sources: Global Terrorism Database (GTD), World Development Indicators (World Bank), Polity IV Project (Center for Systemic Peace), Major Episodes of Political Violence (MEPV) dataset (Center for Systemic Peace)

Appendix D: Baseline Models with Incident Rate Ratios (IRR's)

Full Sample	(1)	(2)	(3)	(4)	(5)	(6)
Pri. and Sec. % (PS)	1.00002 (.0036)	1.0190 (.0103)*			.9999 (.0043)	1.0181 (.0129)
PS^2		.9999 (3.5×10^{-5})*				.9999 (4.2×10^{-5})
Tert. % (Tert)			.9967 (.0064)	1.0066 (.0167)	.9942 (.0069)	1.0045 (.0167)
Tert^2				.9999 (.0002)		.9999 (.0002)
Polity IV Score	1.0791 (.0345)**	1.0781 (.0343)**	1.0700 (.0400)*	1.0653 (.0399)*	1.0777 (.0377)**	1.0699 (.0364)**
GDPpc (logged)	1.1025 (.2357)	1.1748 (.2482)	1.1286 (.2767)	1.1180 (.2736)	1.1874 (.2875)	1.2471 (.2980)
Unemployment %	1.0417 (.0137)***	1.0400 (.0138)***	1.0372 (.0141)***	1.0368 (.0140)***	1.0463 (.0139)***	1.0455 (.0140)***
Population (logged)	3.6754 (.5228)***	3.6623 (.5271)***	3.5902 (.6056)***	3.5536 (.6009)***	3.9169 (.6733)***	3.8473 (.6594)***
Urbanization %	.9896 (.0065)	.9912 (.0066)	.9928 (.0068)	.9912 (.0072)	.9914 (.0075)	.9911 (.0075)
Yrs. Of dom. conf. (past 5)	1.3975 (.0715)***	1.4006 (.0716)***	1.4071 (.0691)***	1.4072 (.0693)***	1.4011 (.0802)***	1.4014 (.0798)***
Yrs. Of intl. conf. (past 5)	1.1665 (.1163)	1.1525 (.1102)	1.1251 (.1056)	1.1278 (.1020)	1.1656 (.1257)	1.1479 (.1200)
Avg. annual no. of terror events (past 5)	1.0176 (.0053)***	1.0178 (.0053)***	1.0175 (.0052)***	1.0176 (.0052)***	1.0171 (.0058)***	1.017 (.0058)***
No. of countries	145	145	149	149	144	144

Note: Dependant variable is the number of domestic terrorism events per year. Models include a set of dummies for region and year; all parameters are lagged by 1 year (t-1) except for the last three control variables. Robust standard errors are in parentheses: *, **, *** denote statistical significance at the .1, .05, .01 levels, respectively.