

ABSTRACT

Title of thesis: THE IMPACT OF NATURAL DISASTERS ON
KURDISH TERRORISM IN TURKEY 1987-2011: THE
IMPORTANCE OF ADEQUATE GOVERNMENT
RESPONSES TO NATURAL DISASTERS

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Natural disasters and terrorism present major challenges in their aftermath to a state and its populace, and help to define the identity of nations (Flynn, 2008). Destructive in their own right, previous research has argued that natural disasters also provide the catalyst for acts of terrorism (Berrebi and Ostwald, 2011), complicating the role that state actions hold in response to a natural disaster. Responses to natural disasters by a state however vary (Perry and Lindell, 2003), and this thesis posits that the response to a natural disaster presents a unique situation for a state, through perceived adequacy of its response, to alter the rational incentives for a group to engage in subsequent terrorism. Using Turkey between 1987 and 2011 as a case study, these data suggest that the perceived adequacy of a response to a natural disaster is inversely associated with ethno-nationalist terrorism within Turkey in the following month.

THE IMPACT OF NATURAL DISASTERS ON KURDISH TERRORISM IN
TURKEY 1987-2011:
THE IMPORTANCE OF ADEQUATE GOVERNMENT RESPONSES TO NATURAL
DISASTERS

by

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Contents

CONTENTS	II
TABLE OF FIGURES	III
1. INTRODUCTION	1
1.1 OVERVIEW OF THE PRESENT STUDY	4
2. RATIONAL CHOICE	8
2.1 TURKEY	12
2.2 AFTER ATATÜRK.....	16
2.3 TERRORISM IN TURKEY	20
2.4 NATURAL DISASTERS, GOVERNMENT RESPONSES, AND KURDISH TERRORISM....	22
2.5 HYPOTHESES	27
3 DATA	32
3.1 TERRORISM	33
3.2 NATURAL DISASTER DATA	36
3.3 CONTROLS	41
3.4 OPERATIONALIZATION	43
4 METHODS	46
5 RESULTS	50
5.1 TERRORISM IN TURKEY	50
5.2 NATURAL DISASTER PROFILE	51
5.3 NATURAL DISASTERS AND SUBSEQUENT TERRORISM	57
6 CONCLUSIONS	62
7 APPENDIX A	69
8 BIBLIOGRAPHY	73

List of Tables

Table 1: List of variables, their operationalization, and the source from which they were drawn.	43
Table 2: Autoregressive Poisson Coefficient Estimates and Standard Errors for Lagged Natural Disasters and Adequacy of Response on Terrorism	58
Table 3: Autoregressive Poisson Coefficient Estimates and Standard Errors for Lagged Adequacy of Response on Terrorism	60

List of Figures

Figure 1: Distribution of Kurdish People in Turkey	15
Figure 2: Levels of Autocratic and Democratic Authority in Turkey (Polity IV, 2013)	17
Figure 3: Distribution of Terrorist Attacks in Turkey (1995-2001).....	51
Figure 4: Natural Disasters Occurring in Turkey 1987-2011 (CRED, 2010).....	52
Figure 5: Types of Natural Disasters that occurred in Turkey 1987-2011	53
Figure 6: Adequacy of Government Response to Natural Disasters 1987-2011.....	54
Figure 7: Adequacy of Government Response to Natural Disasters 1987-2011 by Location	55
Figure 8: Monthly Adequacy of Government Response (1987-2011).....	56
Figure 9: Monthly Adequacy of Government Response by Location (1987-2011).....	56
Figure 10: Coefficients for Natural Disasters on Turkish Terrorism (0-12 lags).....	Error!
Bookmark not defined.	
Figure 11: Coefficients for Adequacy of Government Response on Turkish Terrorism - 0-12 lags	70
Figure 12: Coefficients for Adequacy of Government Response on Kurdish Terrorism - 0-12 lags	71
Figure 13: Coefficients for Adequacy of Government Response on Non-Kurdish Terrorism - 0-12 lags	72
Figure 14: Coefficients for Natural Disasters on Kurdish Terrorism - 0-12 lags.....	Error!
Bookmark not defined.	
Figure 15: Coefficients for Natural Disasters on Non-Kurdish Terrorism - 0-12 lags	Error! Bookmark not defined.

1. Introduction

Social and economic pressures have led to urbanization across the globe, rendering societies vulnerable to the consequences of both natural disasters and human attack (Kennedy, 2002). While increasing efficiency of resource distribution and resilience to infrastructure failures, high population density has also been connected with increased vulnerability to large-scale disasters (Kennedy, 2002). Beyond implementing legislation to limit population density in strategically vulnerable areas, the state plays a critical role in preparing for, responding to, and recovering from both person-made and natural disasters (NAS, 2002; Waugh, 2006). Though differing in cause, the effects of all disasters require a state to act promptly and effectively to mitigate negative consequences both during the event and in the aftermath (Galea, Nandi, and Vlahov, 2005). Waugh (2006) emphasizes that following a disaster, a state has an explicit responsibility to identify what went wrong and how it can improve its emergency management system before the next major natural disaster or ‘catastrophic terrorist attack’. A state’s real or perceived failure in this duty to its populace can magnify the disaster’s economic, political, and social costs, triggering long-term negative consequences for a state and its citizenry (Sönmez, Apostolopoulos, and Tarlow, 1999; Perry and Lindell, 2003; Waugh, 2006).

Terrorist acts are deliberate, willful, and criminal, whereas natural disasters such as earthquakes, hurricanes, and floods are motivationally neutral. Despite these differences in antecedent factors, numerous similarities dictate how a state should prepare for and respond to both acts of terrorism and natural disasters in order to mitigate harm (NAS, 2002; Rose, 2009; Perrow, 2011). While seemingly distinct phenomena, the

academic community has begun to merge the study of natural disasters and terrorism within the domain of ‘emergency events’ (Zhuang and Bier, 2007; Rose, 2009; Perrow, 2011). Recognized through the creation of new journals such as the *Journal of Homeland Security and Emergency Management*, there is increasing recognition that the study of all disaster types within a single domain will provide a more accurate and comprehensive understanding of these phenomena (Rose, 2009). In addition to these similarities in conceptual treatment and the resultant negative consequences, natural disasters may also provide the catalyst for acts of terrorism—further complicating this vital role that state actions hold in the response to natural disasters (Berrebi and Ostwald, 2011). Moreover, the shock inherent in the aftermath of a natural disaster may also exacerbate existing tensions that exist between a populace (any in-group) and the state (out-group) (Berrebi and Ostwald, 2011). While few others have assessed the relationship between state responses to natural disasters and subsequent terrorism, any potential link between these two phenomena warrants further exploration given the magnitude of harm that is generated via terrorist actions. If such a link indeed exists, a state will need to make additional efforts to mitigate harm during and after a natural disaster to avoid a self-perpetuating cycle of disasters or spiral of conflict (Shomer, Davis, and Kelley, 1966; Rummel, 1991).

The diminished security capacity of the state in the wake of a natural disaster has been suggested by the existing literature as the reason for this link. Due to the softening of potential targets through the reallocation of resources, this has been presented as an opportunity for terrorist organizations to exploit (Berrebi and Ostwald, 2011). Berrebi and Ostwald do question the efficacy of this explanation however because of potential

resentment engendered in those affected by the disaster, and offer a list of other potential explanations for why disasters would increase the risk of terrorist attacks. As the impact of a natural disaster is not purely the result of the physical occurrence and is heavily influenced by a state's response (Waugh, 2006), this thesis offers a new argument claiming that the adequacy of the response to natural disasters could incense grievances that might affect the risk of terrorism. As governments, in many cases, underinvest in both their preparedness and response to natural disasters in areas that are perceived as hostile (Cohen and Werker, 2008), inadequate responses in marginalized geographic areas can be viewed as a manifestation of this hostility, and lead to an increase in the utility of subsequent terrorism. Further, the use of resources in response to a natural disaster in other more politically favored areas of the state may incite acts of terrorism due to the perceived disparity in treatment. Particularly in cases where these resources were previously allocated for geographically marginalized areas that are more vulnerable to the removal of these resources (Kinzer, 1999), the state response to a natural disaster may exacerbate existing political and cultural strains within a nation and thus lead to terrorism.

Following from this reasoning, natural disasters would only incite terrorist attacks if the aggrieved marginalized group has an existing tie to a terrorist organization. If true, the relationship between natural disasters and terrorism should not exist in all nations, and will vary depending on the relationship to geographically marginalized and hostile areas. Seeking to explore how government actions in response to a natural disaster influences future acts of terrorism for these distinct types of terrorist threats, this thesis posits that terrorist organizations that support a geographically and ethnically isolated

constituency that is economically dependent on the central government are more reactive to the government's response to natural disasters. In order to explore the relationship between natural disasters, the adequacy of the government's response, and subsequent terrorism within Turkey, autoregressive Poisson regression models are used.

1.1 Overview of the Present Study

This thesis examines the relationship between natural disasters, the adequacy of state responses, and subsequent terrorism using the years from 1987 to 2011 in Turkey as a relevant case study. In addition to being the setting for numerous natural disasters and terrorist attacks, Turkey was selected as a case study due to the nature of its ongoing conflict with terrorist organizations linked to the Kurdish people. As the Kurdish people primarily inhabit the more mountainous and economically marginalized southeast of Turkey (Natali, 2005), their geographic isolation provides an ideal context to evaluate whether the relationship between natural disasters and subsequent terrorism is consistent across terrorism types and geographic locations within a nation. For natural disasters that occur in areas associated with the identity of a constituency, an inadequate government response may serve to aggravate existing grievances in addition to increasing the vulnerability created by the inaccessibility of vital resources. While other types of terrorism exist within Turkey, the constituencies of Islamist and Leftist terrorist organizations were not socially marginalized or geographically concentrated to the extent of the Kurdish people during this period. As such, it follows that government responses should not have had an impact on terrorism committed by these groups as the response may not be connected to the identity of a specific terrorist constituency. These factors, combined with the political history of Turkey that will subsequently be discussed, render

it plausible that the adequacy of the Turkish government's response to a natural disaster may only be relevant for Kurdish terrorism within Turkey.

Expanding upon the ideas of Waugh (2006), this thesis proposes that in the aftermath of a natural disaster a state's response can either support or diminish the rational justification for subsequent acts of terrorism. If the state is unable to adequately support its people in a time of crisis such as a natural disaster, terrorism exists as a means for addressing this grievance against a state by communicating a strong political message (Crenshaw, 1981). As such, through mitigating the harm incurred by its populace from a natural disaster, the rational incentive to engage in an act of terrorism against a state would be undermined. Further, if it is perceived to have prepared adequately or has previously responded well to similar events, the justification for acts of terrorism may also be eroded through this process.

Drawing upon the framework of Rational Choice theory, this thesis also specifically observes that rational choice can operate at the group level where groups of people may bond together to act in their collective interests (Olsen, 1971; 1982; Goodwin, 2012). This is congruent with much of the extant literature regarding terrorism which has indicated that the long-term survival of terrorist organizations, their recruiting practices, selection of tactics, and strategic foci are all influenced by decision-making processes that are not reducible to any single individual (McCormick, 2003; Brym and Araj, 2006; Kavanagh, 2011; Dugan and Chenoweth, 2012). As decisions regarding terrorist behavior are most often made as an organization and are subject to a number of

dynamic political pressures (McCormick, 2003; Goodwin, 2012), rational choice for the purposes of this thesis should be understood at the group level.

This study will be the first to look at how the adequacy of a state's response to a given disaster impacts future acts of terrorism. Earlier research on this topic has posited that government attention to the aftermath of a natural disaster functions as a mechanism reducing the perceived cost for a terrorist organization associated with a subsequent act of terrorism (through target softening) (Berrebi and Ostwald, 2011). Heeding Goodwin's (2012) advice to avoid overgeneralizations by considering reasons why terrorist organizations may also refrain from violent actions, this thesis also considers cases where a natural disaster may not lead to subsequent terrorism. As the response to a natural disaster by a population is not consistent across events within a nation however (Perry and Lindell, 2003), this observed association might not be solely due to the presence or absence of natural disasters. Instead of viewing natural disasters as target softening influences that lead to subsequent terrorism, this thesis argues that it is the government's response to a natural disaster that alters the rational incentives to engage in subsequent acts of terrorism. Thus, if a state is unable to respond to the needs of its people in the wake of a disaster, the potential benefits of terrorism will increase as the political incentives for engaging in terrorism would be magnified. Also contrary to the generalizations advanced by Berrebi and Ostwald (2011), this dynamic should only apply to terrorist organizations that have a vested interest in the well-being of their geographically isolated and economically dependent constituency – people who are particularly affected when a disaster strikes. As such, the findings of this study may be relevant to other ethno-nationalist/separatist terrorist groups; which include those with

links to the Saharawi within Morocco, the Kashmiri within India, and the Afars people within Eritrea, each of whom have high levels of geographic concentration comparable to the Kurdish people (Natali, 2005; Hoffman, 2006, MAR, 2013).

2. Rational Choice

Built on the proposition that human actors are inherently rational and seek in all actions to maximize their own net utility, theories of rational choice are often viewed as central to understanding criminality and to justifying criminal justice responses (Piliavin, Thornton, Gartner, and Matsueda, 1986). Drawing deeply upon the work of Bentham (1780/2007) and Beccaria (1764/1963), the justification for the formation of societies and the introduction of laws to govern a society rely heavily on this assumption of rationality;

Some tangible motives had to be introduced, therefore to prevent the despotic spirit, which is in every man, from plunging the laws of society into its original chaos... It was, thus, necessity that forced men to give up part of their personal liberty, and it is certain, therefore, that each is willing to place in the public fund only the least possible portion, no more than suffices to induce others to defend it (Beccaria, 1764/1963:12-13)

Under this proposition it would be irrational for an individual to sacrifice their liberty unless the state is able to provide other tangible benefits that outweigh these costs (Brandt, 1995). For example, it may be rational for an individual to sacrifice their freedom to ingest illicit substances in exchange for personal protection, adequate health care, and access to infrastructure. Thus from a rational choice perspective, any state that is unable to offset the perceived cost of being subject to its laws should expect deviation from these laws (Beccaria, 1764). Further this thesis argues that if a state restricts the full privileges of citizenship to only a subset of its populace, then it should expect those who have been excluded to deviate from these laws. Following the lead of previous scholars who have claimed that terrorists are rational actors (LaFree and Ackerman, 2009; Dugan and Chenoweth, 2012), terrorism exists as one of the plethora of rational options open to the individual who is unable to derive adequate utility from membership to a state.

As outlined above, this thesis adopts an understanding of Rational Choice theory that posits that rational choice may also operate at the group level. This assertion is common within the terrorism literature, and this has been echoed in the literature surrounding the decision-making process of terrorist organizations (McCormick, 2003; Brym and Araj, 2006; Kavanagh, 2011). This thesis posits that policies that systematically exclude people from the benefits of citizenship, such as inadequate support in the wake of a natural disaster natural disasters (Waugh, 2006), present forms of motivation that could further provoke marginalized individuals to abandon their individual self-interests in lieu of the rational priorities of the group that encompasses them. Specifically, the perceived adequacy of a government's response to a natural disaster can motivate established terrorist groups to respond with violence. As such, terrorism in the wake of a natural disaster can be seen as a rational response, even in cases when it appears to be irrational for those who commit the act.

The notion of external pressures conditioning terrorism as a rational response has been observed as being pointedly relevant to understanding terrorism more broadly (Hutchison, 1972; Crenshaw, 1991; Pape, 2003). While part of the theoretical understanding for the motivation acts of terrorism, the precipitating stressors in every case will not always be evident. Particularly in cases where a long temporal interval exists between the coercive act and the subsequent act of terrorism, 'coercers remain unaware of the connection between what they have done and what looks to them like unrelated willful opposition' (Sidman, 2003:88). Particularly in the aftermath of a natural disaster, rational reactions by terrorist groups take time to come to fruition due to the disruption of access to resources and forms of social support (Kaniasty and Norris, 2004).

As such, the antagonistic actions that generated the impetus for an act of terrorism may not be immediately evident nor appear explicitly malicious in nature, as may be the case in a government's response to a natural disaster (Kavanagh, 2011). Additionally, a state's practices in a geographically separate region may also exacerbate existing grievances and provoke subsequent acts of terrorism. This will be further discussed later within the Turkish context. These temporal delays and the geographic profiles of a nation may make it difficult for a state to both identify itself as the source of coercion and associate itself to the rational response of a subsequent act of terrorism (Kavanagh, 2011). As it is unclear within the present literature how long the lag may be between government actions and subsequent terrorism, a variety of lags are tested in the present analysis (Appendix A) in order to observe how long this process might take in the aftermath of a natural disaster.

As the state's response to a natural disaster is unlikely to be consistently effective across disasters, not all disasters will incite a terrorist response. Indeed, this thesis posits that when disaster management and relief efforts are perceived as being properly coordinated the result will be positive social outcomes that could lead to altruistic actions within the impacted communities (Perry and Lindell, 2003). Social support mobilized through this process for example often occurs in spite of 'previous community conflicts and race, ethnic, and social class barriers', and may engender subsequent altruistic actions within the impacted area (Kaniasty and Norris, 2004). Rather than leading to target softening alone (Berrebi and Ostwald, 2011), the response to a natural disaster may also stimulate positive social and cultural outcomes for the relationship between a state and its populace. Consequently, the response to a natural disaster may present a unique

situation for a state to alter the rational incentives for a group to engage in a subsequent terrorist action particularly in light of previous hostility.

Based on the above framework, one might expect that democracies that incorporate multiple points of view and socialize with out-groups (Hale, 1923; Sampson, 1984) would experience less terrorism than more autocratic societies. Yet, scholars have consistently found that democracies encounter more acts of terrorism than authoritarian states (Gurr, 1979; Turk, 1982; Chenoweth, 2010). Young and Dugan (2011) provide one possible explanation for this, suggesting that despite the greater political freedom fostered by a democratic state, the greater the potential for political stalemates, which could lead to acts of violence. As such, in seeking to minimize the rational basis for acts of terrorism, the literature suggests that a state's duty to its people extends beyond acknowledging the multiple voices of its people, and extends to acting upon these views. Importantly, rather than purely being a function of the ability of a state to fulfill this duty, it is the populace's perception of the disaster response that matters in this interaction (Drury, Novellie, and Stott, 2013). As such, a state's actions along with its populace's perception of these actions, more than its structure, reduces incentives for acts of terrorism.

As the range of governance structures and priorities varies immensely across the globe (Polity IV, 2013), this duty of a state to its populace also varies. In the case of Turkey, this duty is publicly affirmed and is encompassed by the notion of *devlet baba*. Under the Turkish model of *devlet baba*, loosely translated as 'the father state', political structures dominate all else to ensure these priorities are upheld (Kubicek, 2002). In a recent interview, the president of Turkey, Abdullah Gül, affirmed this responsibility

where he stated that the ultimate objective for Turkey was to have its own standards raised to the highest possible point through the protection of human rights and the interests of Turkey's people (Tepperman, 2013:7). Further, when questioned whether Turkey valued pursuing the ambition of state growth, Gül reiterated that Turkey explicitly aims to be a virtuous power; 'where [Turkey's] priority lies with safeguarding the human rights and interests of all human beings in a manner that also entails the provision of aid to those in need without expecting anything in return' (Tepperman, 2013:7). Kubicek (2002) argues that despite this rhetoric, historically state authority has been prioritized over citizen empowerment and participation, and others have observed that democratic functioning has been quite restricted in the past (Özbudun, 2000; Abramowitz, 2000). This nexus between Turkey's rhetoric and perceived relationship with its people, and the justification of terrorism will be further discussed in relation to the Kurdish population that inhabits much of Turkey.

2.1 Turkey

Terrorism cannot be divorced from its political, social, and historical context. The unique history of the groups must be integrated into any analysis that seeks to investigate the perpetration of terrorism (Crenshaw, 1981). While certain patterns of terrorism are observable globally using nations as the unit of analysis (Berrebi and Ostwald, 2011; Fearon and Laitin, 2012), these analyses have been unable to measure sub-national variation within individual states. As both terrorism and hostility between a government and segments of a populace vary geographically and temporally within a nation (Levi, Juliano, and Richardson, 2007; Berrebi and Lakdawalla, 2007), to allow the identification of how natural disasters and government responses act as precursors to terrorism, the

current analysis measures monthly changes in Turkey over 24 years (June 1987 – December 2011, with the exception of 1993). As the presence of an existing grievance with the state in addition to geographic isolation has been presented as being relevant to the relationship between the perceived adequacy of a government's response to a natural disaster and subsequent acts of terrorism, the following section documents these characteristics within Turkey.

Turkey is and historically has been a bridge between Europe, Asia, the Middle East, and the Caucasus (Tepperman, 2013). Conflict in this region dates back millennia due to its strategic geographic importance (Köker, 1995). From its historical roots as part of the Ottoman Empire, the independence of this nation in 1923 brought about a rapid secularization of citizenship and the emergence of strong notions of Turkish nationalism (Dokupil, 2002; Natali, 2005). Marked by rapidly growing refugee populations, political uncertainty, and a devastated economy in the wake of World War I, a number of stark changes to Turkey's social structure occurred during this period (Zürcher, 1991). Turbulent social and cultural changes also occurred for the Kurdish people who inhabit this region, as they were predominantly divided amongst four emerging nations (Natali, 2005). Comprising 20% of Turkey's population and inhabiting nearly a third of the country's geographical area and agricultural lands, according to Şimşir (1973) the support of the predominantly Islamic Kurdish people was vital to the political and initial viability of a Turkish state. To help cement this necessary strategic relationship to this emerging Turkish government, the leader of the Turkish independence movement, Mustafa Kemal, proposed forming a Turkish-Kurdish sisterhood and a federation of Kurdish states in return for Kurdish support (Natali, 2005).

Despite these initial promises to the Kurdish people and the political maneuvering used to support the formation of a Turkish state, Kemal, under the new name Atatürk (*Father Turk*), subsequently moved to disconnect Islamic culture from Turkey's identity in his new role as Turkey's first president (Dokupil, 2002). According to Natali (2005) the grievances between the Kurdish people and the Turkish government began at this nascent point, and were exacerbated through policy enforced cultural changes were that incorporated at all levels of Turkish society during this period of 'Turkification' which prioritized secularism within the emergent Turkish culture. Observed in the appearance of Pan-Turkish symbols on money, stamps, university paraphernalia, and the prohibition of the word "Kurd", the Kurdish people were culturally marginalized (Dokupil, 2002; Natali, 2005). 'Turkification' can also be seen to have culminated in the 1938 Law of Associations, which prohibited the formation of societies based on religion, family, community, or class and the participation in religious activities by political parties (Dokupil, 2002; Kus and Özel, 2010).

Based upon these structural changes, it can be seen that the incentives for Kurdish support of the Turkish state were eroded by these enacted policies, changes to political rhetoric, and the denial of a legitimate social identity. Further, Natali (2005) posits that the impacts of these hostile policies extended to Kurdish social structures, changing the very nature of the Kurdish identity. The majority of Kurdish people trace their origin to the Median Empire in the 6th century B.C.E., as a complex and multifaceted collection of tribal communities (Natali: 2005). During the period following Turkey's federation however, external pressure from the Turkish state ethnicized the Kurdish collective identity (*Kurdayetî*) leading to the national divergence of the Kurdish identity between

countries, and its homogenous portrayal within Turkey's political sphere (Natali: 2005). Thus, although Kurdish people live throughout a number of nations within the region (Figure 1), both their cultural identity and their relationship to the state vary markedly between nations. The ethnicization of the Kurdish people has been attributed within the extant literature to the negative incentives offered by the central government and the actions and reactions of Kurdish groups to these prohibitive incentive structures and cultural insecurity (Içduygu, Romano, and Sirkeci, 1999; Dokupil, 2002; Natali, 2005).



Figure 1: Distribution of Kurdish People in Turkey

Even in the contemporary context, Gunter (2000) has argued that the Kurdish demand for cultural, political, and linguistic rights has been seen as a threat to Turkish sovereignty. From this perspective, as it existed in Atatürk's rhetoric, the mere existence of *Kurdayetî* was portrayed as directly opposing the unity of the secularized Turkish nation. Borrowing the framework of insecurity from Içduygu, Romano, and Sirkeci

(1999), this rhetoric created a political space where any gains in physical and cultural security for the Kurdish people could only come at the cost of the physical and cultural identity of the unified Turkish state. From the Turkish State's perspective, this cultural dimension of policy was intended to create 'a new Turk obedient to and in service of the new state and allegedly equal to [one another]' (Köker, 1995; Gunter, 2000). Within Atatürk's rhetoric, this process of 'Turkification' aimed to improve the lives of the entire population as per the notion of *devlet baba* if taken at face value. This policy situation however necessarily required physical and cultural insecurity for any individual not adhering to the new regime, and for the Kurdish people it minimally ensured cultural insecurity for those who were willing to abandon their existing cultural capital.

2.2 After Atatürk

While similar political stances towards the Kurdish people can still be evidenced today (Criss, 1995; Gunter, 2000), it is important to note that subsequent governments have varied in their policy stances on these cultural issues. Indeed as illustrated in Figure 2, since the end of Atatürk's and Republican People's Party (RPP) authoritarian rule in 1946, Turkey has experienced a wide variety in government stances, which is particularly evident with regard to shifts policy and perspective related to the Kurdish population. Under Democratic Party (DP) governance in the 1950s, the Turkish people experienced a discernible increase in national literacy rates and the number of industry workers. In addition, this period witnessed the birth of the union movement in Turkey. All of these trends challenged the preceding authoritarian notions of guardianship and *devlet baba* (Köker, 1995).

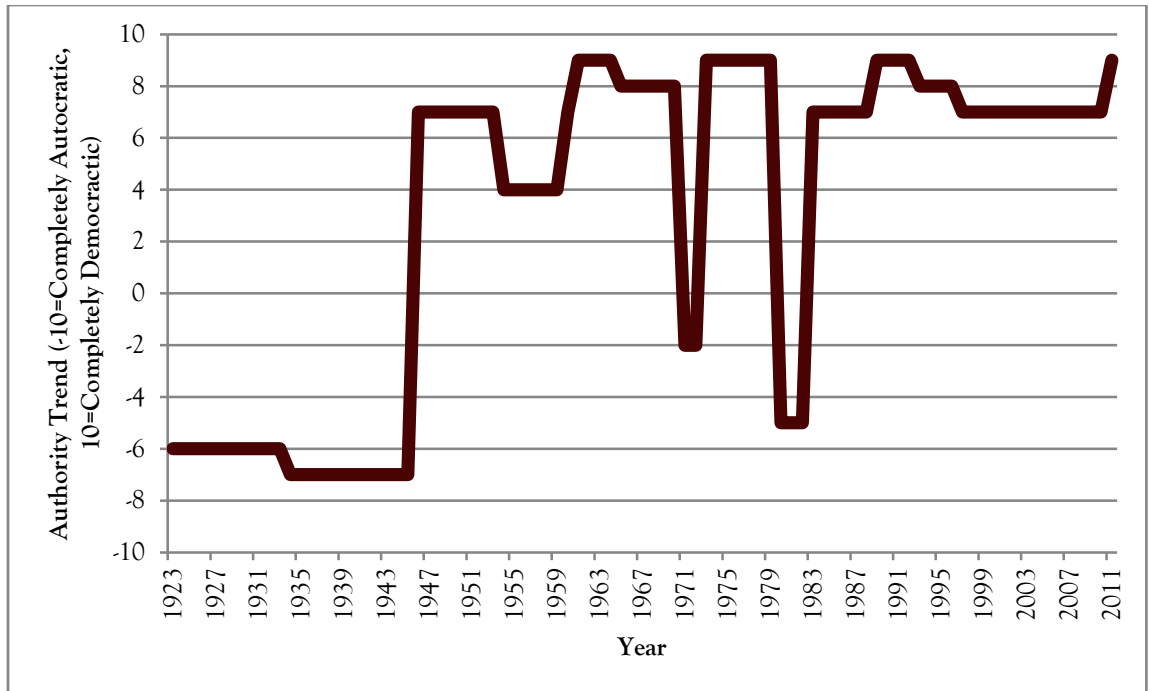


Figure 2: Levels of Autocratic and Democratic Authority in Turkey (Polity IV, 2013)

A number of legislative changes were introduced during this period that addressed some of the Kurdish dissatisfaction with the Turkish government. Marked by a new Constitution in 1961, new laws were introduced in Turkey that placed rival political parties under constitutional protection, Leftist political groups (with no religious affiliations) were granted legal status, and presidential power was limited through a series of checks and balances (Harris, 1974). Further, article 19 of the new Turkish Constitution guaranteed for the first time freedom of religious faith and worship, and freedom from abuse of one's religion by others (Dokupil, 2002). The cumulative effects of these policy reforms directly improved the existing conditions for the Kurdish people (Natali, 2005). However, despite these policy changes and the improving physical conditions for the people of Turkey including the Kurdish people, no official changes were made to the official underlying ideology of Turkish citizenship according to Natali (2005). Uneven

economic development resulting from the politicized use of legislative and permitted bureaucratic power further increased the disparity between the Kurdish regions and the rest of Turkey (Köker, 1995; Natali, 2005). This growing divide in quality of life between non-Kurdish Turks and the Kurdish people have increased the rational justification for finding methods to undermine the existing structures in order to bridge this gap.

Since the politically turbulent 1970s, the social and political climate for the Kurdish people has further improved, especially since the country's leaders began pushing for admittance into the European Union, which requires adherence to democratization goals (Wuthrich, Ardag, and Ugur, 2012). Current laws allow parents to give their children Kurdish names; and some classes that teach the Kurdish language are now permitted (O'Neil, 2007). However, despite these limited legislative concessions, which reduced some of the cultural insecurity for the Kurdish people, many existing causes for conflict still persist. For example, armed paramilitary forces supported by the Government are still stationed in these predominantly Kurdish areas despite their dubious legal status (Natali, 2005; Uslu, 2009; MAR, 2013). These paramilitary groups have been linked to the killing of at least 18 Kurdish civilians between 2004 and 2006 (Human Rights Watch, 2006 in MAR, 2013). While numerous other violations of human rights can be observed in Turkey, it is evident that the Turkish government continues to treat Kurdish people as second-class citizens (Criss, 1995; Natali, 2005).

Terrorism exists as just one of a plethora of options for rationally responding to marginalization, and the Kurdish people have made numerous attempts to influence the governance of Turkey through other, legitimate means. Despite laws such as the 1938 Law of Associations that prohibits the formation of societies and political parties based

on family, community, religious or class interests, the Kurdish people have attempted to influence the legislative process (Dokupil, 2002; Kus and Özel, 2010). In 1990, 10 pro-Kurdish individuals who had previously represented the Social Democrats founded the Halkin Emek Partisi (HEP), otherwise known as the People's Labor Party (Kogacioglu, 2004). Echoing the framework that Turkish legislation and rhetoric had previously established, charges were leveled against this party regarding its allegedly separatist nature in 1993. The Turkish Constitutional Court subsequently dissolved this political party due to its alleged separatist agenda (Casier, 2010). The founders of the HEP were also involved in the creation of the Democratic Party (DEP), which was barred from political participation in 1994, and the succeeding People's Democracy Party (HADEP), was also disbanded by the government in 2003 (Casier, 2010). In none of these cases was the political party officially Kurdish. Rather the case against these parties rested on their members attending Kurdish rallies or repeating Kurdish slogans in sessions of Parliament (Kogacioglu, 2004);

A rather arbitrary boundary between the political and cultural domains informs these decisions. The Court operates with the understanding that once this boundary is transgressed, what may be harmless when an issue is cultural—such as the use of the headscarf or of the Kurdish language—may turn into a political symbol threatening the basis of the united, democratic, and progressive nation-state (Kogacioglu, 2004:433).

The above quote represents a legal interpretation of the findings from the Turkish Constitutional Court, and it is evident that many of the themes that began as symbolic laws associated with Atatürk's secularist push are maintained through these legal and legislative structures. A further two political parties DEHAP (2003-05) and DTP (2005-09) with ties to the Kurdish people have since been disbanded by the court for similar reasons relating to an 'organic' connection to the terrorist organization, the Kurdistan

Workers Party (PKK) (Casier, 2010; Topal, 2011). The current incarnation of this series of political parties with Kurdish ties, *Bariş ve Demokrasi Partisi* (BDP), was still officially recognized at the time that this thesis was written despite numerous arrests of party officials (Casier, Jongerden, and Walker, 2011).

This succession of attempts to represent the Kurdish people in the official political realm existed as alternate means for responding to the coercion exerted by the Turkish Government. By thwarting these attempts to gain legitimacy through the political process the Turkish Government further substantiated the second-class status of Kurdish people. The legal dismissal of these parties confirms the cultural insecurity experienced by Kurdish people in the public realm. Although the official relationship between each of these parties and the Kurdish people has not been straightforward (Casier, 2010), each of the times that one of these parties was disbanded exhausted another legitimate method for resolving the conflict between the Kurdish people and the Turkish Government.

2.3 Terrorism in Turkey

The conflict between the Turkish Government and the Leftist terrorist organization *Partiya Karekeren Kurdistan* (PKK) has been described as Turkey's largest current problem (Roduplu, Arnold, and Ersoy, 2003; Economist, 2013). This conflict has been linked to the reasons behind why Turkey's democratic processes have not advanced in the previous decades, the internal justification of Turkey's bad human rights record, the strong influence that the Turkish Army has had over political life, and economic strain of the entire nation (Köker, 1995; Dokupil, 2002; Natali, 2005; Economist, 2013). Further, the majority of the estimated 30,000 to 35,000 terrorism-related deaths between 1984 and 2000 have been attributed to this conflict (Roduplu, Arnold, and Ersoy, 2003). The PKK

grew out of the previously described political upheaval of the 1960s and 70s in Turkey, and has been closely linked to the plight of the Kurdish people (Roduplu, Arnold, and Ersoy, 2003). While the literal translation of PKK, Kurdistan Worker's Party, implies that it is part of the Kurdish Separatist movement in Turkey (Roduplu, Arnold, and Ersoy, 2003; Çandar, 2012), it was instead founded in 1974 by Öcalan as a Marxist-Leninist separatist organization (Criss, 1995);

Thus, the story of the PKK dates back to the early 1970s. It emerged not in the guerrilla camps on the rugged terrain of Southeast Turkey, and not in any other neighbouring country in the Middle East but in Turkey's capital city one day in 1974. In other words, as far as its original roots are concerned, the PKK came to being not in the Kurdish-populated eastern parts of the country but in Central Turkey. It has, however, always been dominated by Öcalan (Imset, 1992:9 in Özcan, 2006:79).

The complex political landscape in Turkey coupled with the physical and cultural insecurity in this period fostered the unusual alliance between the movement for Kurdish cultural rights and Marxist-Leninist revolutionary ideologies (Natali, 2005). Despite their varying motivations and histories, İçduygu, Romano, and Sirkeci (1999) conclude that collaboration with groups such as the PKK is one of only four viable options that the Kurdish people have to address the physical and cultural insecurity that they faced. Other than collaboration with the PKK or similar groups, İçduygu, Romano, and Sirkeci (1999:995) identify that the Kurdish people could “resign themselves to the status quo and continue to live as they have before”, immigrate elsewhere, or choose to collaborate directly with the Turkish government. While these options are not mutually exclusive and individual Kurds may choose their own paths, any of the three other options would entail physical and cultural insecurity for those who continue to express their Kurdayetî and each individual who chose to deny it.

Similar motivations were also behind the PKK's alliance with the Kurdish people. Criss (1995) proposes that the PKK gained advantage through its post-hoc alliance with the Kurdish people, as it became obvious that the Marxist-Leninist (atheist) PKK was unable to draw the mass support it needed from a society with strong religious traditions. As such, while the PKK and Kurdish people's goals were not be directly aligned, external coercion in the form of lack of public support for the PKK and Government suppression for the Kurdish people provided the rational justification for a partnership between these two groups. Öcalan, the founder of the PKK, has also explicitly stated that it was only through forces of external coercion that the PKK came to be allied with the Kurdish cause;

I did not emphasize Kurdayetî along with the other leftists during the 1960s and 70s because the extreme left was very strong and Kurds lost their confidence. Also, there was not a dictatorship in Turkey during this time. We created the PKK in 1978 at the time of the massacres in Karamaraş. Still it was not a party uniquely for the Kurds or for Kurdayetî. It was an idea of the socialists... Our revolution was socialism... (Perinçek, 1989:16-33 in Natali, 2005:112).

2.4 Natural Disasters, Government Responses, and Kurdish Terrorism

This earthquake is a declaration of bankruptcy for the Turkish political administrative structure. The Turkish political and administrative systems must be investigated from the ground up (Erkan Mumcu, Turkish Tourism Minister, 1999 in Green and Ward, 2004).

Natural disasters are an exogenous shock that also presents a form of external coercion that causes physical insecurity for a population (Flynn, 2008). Unrelated to the political and social landscape, natural disasters have the ability to rupture the fabric of even the most productive and orderly human environments (Hewitt, 1983). Scholars argue that natural disasters exacerbate existing tensions between a state and its populace

(Berrebi and Ostwald, 2011), and they reveal the lack of preparedness of a state for dealing with crises (Waugh, 2006). Conversely, if responded to adequately, a properly coordinated disaster management and relief effort can result in positive social outcomes which can be evidenced by the altruistic actions of the impacted community and the state (Perry and Lindell, 2003). Kaniasty and Norris (2004) have dubbed this process ‘the heroic stage’, observing that the social support mobilized through this process often occurs in spite of ‘previous community conflicts and race, ethnic, and social class barriers’. Connected to the idea that the cause of the disorder is immediately identifiable and is unattributed to human action, the need for an immediate response to this external stressor mobilizes those impacted, creating a post-disaster utopia (Hall and Landreth, 1975; Kaniasty and Norris, 2004). This altruistic social reaction is often short lived especially in cases with ineffective state support.

Typically, victimized communities soon discover that the need for assistance far exceeds the availability of resources. The initial generosity and togetherness are slowly overtaken by a gradual disillusionment and the harsh reality of grief, loss, and destruction (Kaniasty and Norris, 2004:201)

Given that the state’s response to a natural disaster can make it either the hero or the villain to those impacted, and that this status can vary from one disaster to another, it does not necessarily follow that the vulnerabilities that are presented by a natural disaster provide ideal terrorist targets. Indeed, Berrebi and Ostwald (2011) in their discussion note that an immediate terrorist attack following a natural disaster may instill resentment among those who have previously been part of the terrorist group’s constituency. While this was unaccounted for in their empirical model, this assertion is consistent with the rational choice framework described in this thesis. If the state’s response has been

deemed to be inadequate however, and as the full impact of the destruction is realized, existing tensions between a state and its populace will be exacerbated.

This thesis holds that the *perception* of the government's response, rather than the actual government response itself, bears weight on the subsequent decision to engage or not to engage in a terrorist action. The disparity between the perception of a government response and the actual government response is particularly evident in the 1999 earthquake that occurred in Marmara, Turkey. In the National Academy of Sciences (NAS) report on disaster management (2002) cited in the introduction, the swift response in restoring power after this 7.4 magnitude earthquake was lauded, and extolled as an example of the importance of having planned alternatives to reduce the downtime of critical systems and expedite response and recovery. Despite the apparent high level of preparation inherent in Turkey's infrastructure, Kubicek (2002) laments that these positive responses did not ease the underlying political unrest in the nation:

... many hoped that the 1999 earthquakes would lead to an invigoration of civil society and subsequent political liberalization. Examining this claim shows that Turkish civil society has not been able to sustain the energy it enjoyed immediately after the earthquake because of factors within civil society itself and the attitude of the state (Kubicek, 2002:761).

Regardless of the practical response to the Marmara earthquake, the perception that the response did not unify the existing political tensions was publicly observed to be a great disappointment in this instance. Further, in light of previous dissatisfaction with the government, the impacts of the earthquake itself were in many instances equated to the inability of the Turkish Government (Geitner, 1999). Although bounded by the precarious nature of the rescue attempts, the mounting death toll and the continued spread of damage were in many cases attributed to government actions (Akinci, 1999; Geitner,

1999). Earlier policy decisions for example were publicly presented as the reason for the magnitude of the damage rather than the magnitude of the earthquake (Akinci, 1999), and this directed the public focus away from the successful rescue efforts and preparations cited by the NAS. Consequently, while an adequate practical response is required for positive and cohesive social outcomes following a natural disaster, it is instead the perceived adequacy of this response by a populace that exacerbates existing grievances and influences the subsequent decision to engage or not to engage in a terrorist action.

While the Marmara earthquake occurred in northwest Turkey, its impact was felt to various degrees throughout the rest of the nation and especially by the Kurdish people who predominately inhabit the southeast (Figure 1). In an interview conducted a week after the earthquake, then Prime Minister, Bülent Ecevit announced that he was no longer able to sustain his support for large investments to combat poverty and unemployment in the predominantly Kurdish southeast due to the costs associated with the disaster response (Kinzer, 1999). In addition to the redistribution of public funding away from the southeast, Huseyin Umit, mayor of Hakari and a leader of the pro-Kurdish People's Democracy Party, expressed Kurdish frustrations with this response in comparison to previous treatment that the state had provided to the Kurdish people:

We have been through a similar situation... We had our own 'earthquake' when our villages were evacuated, and we became very poor during the fighting between Turkish troops and Kurdish rebels. Nobody has given us any help or compensation, but we want to be mature and patient. Although promises have been made to us, we cannot expect that they will be kept until these difficult days are over (Kinzer, 1999).

This perceived grievance against the inequitable government support can be seen on its own to further incentivize reactions against the state from the Kurdish people.

Beyond this however, Green and Ward (2004) posit that this earthquake exposed

systematic corruption and wide-scale human rights violations that exacerbated the negative impact of the earthquake. Far from the high level of preparedness described by the NAS (2002) it has even been argued that Turkey's negligent preparation should be seen as a series of criminal acts (Green, 2005). As part of the privatization that began in the 1950s and rapidly expanded in the 1980s, hundreds of construction and housing laws were repealed and developers were discouraged from following those that remained (Kubicek, 2002, Green and Ward, 2004). Indeed, there were at least 12 periods of construction amnesty that occurred between 1948 and 2001 despite the opposition of the Turkish Chamber of Architects and Engineers (Green and Ward, 2004). Through these policy actions that led to sub-standard construction, the government was seen to have failed in its duty to protect the people and was connected to exacerbating the damage from the earthquakes (Kubicek, 2002). In light of this exacerbated harm and the violation of *devlet baba*, the Turkish state in this period was not only a softer target (Berrebi and Ostwald, 2011), but also a morally justifiable target for retribution via legitimate and illegitimate means.

While the immediate aftermath of the natural disaster often leads to altruistic and 'heroic' behavior (Kaniasty and Norris, 2004), if the state is perceived to handle its responsibility inadequately, the incentives for terrorism and other criminal acts against the state increase following this initial period (Waugh, 2006). Especially in light of the previously discussed systematic and arguably criminal practices that undermined the housing industry in Turkey and explicit coercion that enabled this system of corruption (Kubicek, 2002; Green and Ward, 2004; Green, 2005), the preexisting motives for terrorism were exacerbated. Further, given the clearly defined and unifying nature of the

natural disaster, it is plausible that these stressors provide the impetus for the commission of act of terrorism. Consequently, as communities are united by the impact of a natural disaster and polarized through the subsequent response by the state, a natural disaster may provide the catalyst for the temporal and geographic variation in terrorist actions.

2.5 Hypotheses

Stemming from the above theoretical argument and political history regarding Turkey, natural disasters, and terrorism, this thesis poses four major hypotheses. The first is principally concerned with identifying whether the link between natural disasters and terrorism is direct, and to observe whether any relationship fluctuates over time.

Continuing the line of research into the relationship between natural disasters and terrorism, this thesis specifically seeks to evaluate whether the perceived adequacy of a government's response has an impact on the relationship between natural disasters and subsequent ethno-nationalist/separatist terrorism within a nation. Although Berrebi and Ostwald (2011) observed variation in the effects of a natural disaster and subsequent terrorism across types of disaster, it is unclear what processes were driving this variation.

From the perspective advanced by this thesis, when a government's response to a natural disaster is perceived as adequate it should reduce the number of subsequent terrorist attacks. This hypothesis if true, would identify that the government has a unique opportunity to respond to natural disasters in ways that alter the underlying motivations to engage in terrorism, thus reducing terrorism. Specifically, the hypothesis that will be tested is:

H1. The perceived adequacy of the government's response to a natural disaster is inversely related to the number of subsequent terrorist attacks within Turkey.

Given the importance of a state's ability to prepare for and react to a natural disaster in order to minimize both short and long-term negative consequences within the literature (Kaniasty and Norris, 2004; Galea, Nandi, and Vlahov, 2005; Waugh, 2006), the rival hypothesis presented here allows for a natural disaster to be a catalyst for improved relations between a state and its constituency or to aggravate relations leading to more terrorism (Hall and Landreth, 1975; Perry and Lindell, 2003; Kaniasty and Norris, 2004).

Beyond investigating the link between how a natural disaster is responded to by a state and subsequent terrorism, the previous discussion argues that not all terrorist organizations respond in the same manner to these events. Particularly when an organization supports a geographically and ethnically isolated constituency that is economically dependent on a central government, as is the case with the Kurdish people in Turkey, they will be more responsive to the adequacy of the government's response. As such, this thesis postulates that the link between the handling of a natural disaster and subsequent terrorism will also be evident when looking solely at Kurdish terrorist attacks within Turkey. Conversely, when a constituency is not isolated in the aforementioned manners, as is the case for Islamists and Leftists in Turkey, this thesis further argues that the impact of a government's response to a disaster will not have an appreciable effect on subsequent terrorism committed by organizations with links to these groups. As such, this thesis thus explicitly tests the following hypotheses:

H2. a) The perceived adequacy of the government's response to a natural disaster is inversely related to the number of subsequent Kurdish terrorist attacks within Turkey.

b) Regardless of the adequacy of the government response, natural disasters are unrelated to subsequent acts of non-Kurdish terrorism.

Additionally, this thesis seeks to test whether any impact that a natural disaster has on subsequent terrorism is consistent across a specific state. Given the policy importance of both human-made and natural disaster management (Waugh, 2006), it is vital to observe whether these two broad phenomena are indeed related at a unit of analysis more fine-grained than the nation-state. As it has been argued above, Turkey is a nation plagued by both large-scale natural disasters and terrorism that occur in both the predominantly Kurdish southeast and outside of this region, and is therefore an apt subject for this hypothesis. In light of the aforementioned historical dimensions and the connection between religion, culture, and terrorism in Turkey, it is reasonable that for the marginalized Kurdish populations within Turkey that an inadequate response to a natural disaster has an appreciable impact on the rational justification for subsequent terrorism. However, this thesis also recognizes that even a poor response to a natural disaster in many cases will be insufficient to reach the threshold needed to rationally justify terrorism as a response to non-marginalized constituencies. Focusing on the Kurdish southeast of Turkey, this thesis posits that a state's response to a natural disaster will only be relevant to terrorist organizations whose constituencies are impacted by the response to the disaster. Thus, while a 'target softening' based hypothesis would maintain that natural disasters would lead to more subsequent terrorism regardless of location, this

thesis does not expect to observe an increase in non-Kurdish terrorism in the wake of a natural disaster in the southeast of Turkey. To empirically test whether the relationship between natural disasters and terrorism is determined by the geographic nature of the organization's constituency, this thesis tests the following hypotheses:

- H3. a) The perceived adequacy of the government's response to a natural disaster that occurred in the southeast is inversely related to the number of subsequent Kurdish terrorist attacks within Turkey.**
- b) Natural disasters that occur in the Kurdish southeast are unrelated to subsequent acts of non-Kurdish terrorism regardless of the adequacy of the government response.**

In order to gauge the indirect effects that a natural disaster has upon various regions within a nation, this thesis also explores whether natural disasters that occur outside of the southeast also affects Kurdish terrorism. Drawing upon Kinzer's (1999) assertion that the impacts of natural disasters that occurred in the rest of Turkey were felt in the southeast through the removal of resources from this area, an adequate response elsewhere can also lead to an increase in subsequent Kurdish terrorism. Given that the remainder of Turkey's terrorist constituencies are not geographically concentrated nor isolated as is the case with the Kurdish people, this thesis further expects that natural disasters that occurred outside of southeastern Turkey are unrelated to subsequent acts of non-Kurdish terrorism regardless of the adequacy of the government response. This can be seen as an extension of the above argument that these groups have not been marginalized sufficiently in order for a natural disaster and its

response to reach the threshold needed to rationally justify terrorism as a response to non-marginalized constituencies. Thus, this thesis tests the following hypotheses:

H4. a) The government's response to a natural disaster that occurred outside of southeastern Turkey is positively related to the number of subsequent Kurdish terrorist attacks.

b) Natural disasters that occur outside of southeastern Turkey is unrelated to subsequent acts of non-Kurdish terrorism regardless of the adequacy of the government response.

3 Data

To test the above hypotheses, data were compiled from a number of different sources to measure terrorism, natural disasters, the adequacy of the Turkish Government's response to natural disasters, and to provide controls for the relationship between these key phenomena. The following section describes how data were collected for this thesis and how these key phenomena were operationalized. In order to observe how the impacts of a natural disaster vary over time, this thesis combined all of the data collected into a time-series dataset with the month as the unit of analysis. As one of the primary criticisms of the previous approach to investigating the link between natural disasters and terrorism (Berrebi and Ostwald, 2011) was that it was only able to observe yearly variation, the present method offers a methodological advance for this line of research. This thesis will evaluate whether the trend observed by Berrebi and Ostwald (2011) was an artifact of their data that masked underlying variation within the motivations of terrorist organizations. As the previous analysis regarding the relationship between natural disasters and terrorism was limited to yearly data, the time between subsequent years were treated as equivalent even though it could vary between one month and 24 months.¹ Further, when there are multiple incidents within a year, this variation is then essentially aggregated for the analysis. As such, one of the primary goals of this thesis is to evaluate whether it is indeed appropriate to explore this relationship using yearly-level data. Particularly as the lag time is currently unknown between the date of a natural disaster and subsequent terrorism, this level of granularity can help to

¹ This temporal interval may only be one month if a natural disaster occurred in December of year t and an act of terrorism occurred at year $t+1$. Further if a natural disaster occurred in January of year t , and an act of terrorism occurred in December of year $t+1$, this would be treated as being equivalent within this format. Indeed, in this latter case there may be have been a natural disaster that occurred in the same year that is more temporally proximal, that would not be statistically connected using this model.

infer whether it is appropriate to investigate this relationship using yearly-level data in future research on this topic.

While a given natural disaster has the ability to impact an entire nation, even within heavily affected areas individual responses vary markedly (Galea, Nandi, and Vlahov, 2005). Further, it has been previously argued that geographically marginalized populations such as the Kurdish people in Turkey respond to natural disasters differently from the rest of the population, and that the response depends on the location of the natural disaster. In order to capture this potential variation at a sub-national level, all natural disaster events were also coded as to whether or not they occurred in the predominantly Kurdish southeast. While future studies should seek to observe this variation at the province-level, the present study provides justification for using a coarser granularity of geography. To investigate the relationship between natural disasters, the government's response, and subsequent terrorism, data are available for 24 years (June 1987 – December 2011 with the exception of 1993) resulting in 271 months of data for the present study.

3.1 Terrorism

In line with numerous previous studies that have examined terrorism (LaFree and Ackerman, 2008; LaFree, Yang, and Crenshaw, 2009; Enders, Sandler, and Gaibulloev, 2011; Young and Dugan, 2011; Chasdi, 2012), the dependent variables for this study come from the Global Terrorism Database (GTD), the number of terrorism events experienced each month in Turkey. The GTD is an event-based database that contains information on all terrorist events across the globe between 1970 and 2012 (LaFree,

Dugan, Fogg, and Scott, 2006; LaFree and Dugan, 2007).² Data for 1993 were unfortunately lost from this dataset by Pinkerton Global Intelligence Services (PGIS), and this year has been excluded from the present analysis. It should also be noted that this database relies on data collected from public media outlets that report in English. As numerous media outlets in Turkey use languages other than English, it is likely that the data used for this investigation underestimate the total number of terrorist events that occurred in Turkey during the time period being examined (LaFree and Dugan, 2007).

Within the GTD dataset, terrorism is defined as, “the threatened or actual use of illegal force and violence to attain political, economic, religious, or social goals through fear, coercion, or intimidation” (LaFree and Dugan, 2007: 184). Functionally, for an incident to have been included in the dataset, it must contain the following three elements:

- I. The incident was intentional (the result of a conscious calculation on the part of the perpetrator)
- II. The incident included some observable level of violence or the threat of violence
- III. The perpetrator of the incident was a sub-national actor.

In addition to these three criteria, two of the following three conditions must also be met in order for an event to have been included in the GTD:

- I. The violent act was aimed at attaining a political, economic, religious, or social goal
- II. The violent act included evidence of an intention to coerce, intimidate, or convey some other message to a larger audience (or audiences) other than the immediate victims
- III. The violent act was outside the precepts of International Humanitarian Law (START, 2009).

² As the analysis for this study was conducted prior to the most recent release of GTD data, the present thesis only includes data until the end of 2011.

Although the original collection of GTD data was funded by the US National Institute of Justice, and is now funded by the US Department of Homeland Security and the US State Department, the separation of the data collection from a government agency can be seen as a great strength of this dataset. This separation limits the potential for political biases to influence both the data collection procedure and the operational definitions. The complete list of the variables and their operationalization can be found at the end of this section in Table 1.

It should also be noted that out of the 2,194 terrorist attacks in Turkey that were recorded during this period by the GTD, the perpetrator was recorded as unknown for 726 (33.1%) of these events. Although it is plausible that individuals associated with the Kurdish people committed a proportion of these attacks, this thesis has chosen to treat these events as being non-Kurdish attacks in the subsequent analysis. While this should be seen as a limitation of this data source and the present study, Kurdish terrorist attacks are thus operationally defined as terrorist attacks that are attributed to an organization with ties to the Kurdish people. While this has no impact when looking at all terrorism in Turkey collectively, based on the theoretical predictions of this study the presence of Kurdish attacks that have been recorded as unknown within the GTD could lead to type II errors for the relationship between the perceived adequacy of natural disasters on subsequent Kurdish terrorism, and Type I errors for the models that specifically observe non-Kurdish terrorism. As such, estimations of the impact of the perceived adequacy of the response to a natural disaster upon subsequent Kurdish terrorism will likely be conservative in nature.

3.2 Natural Disaster Data

In order to assess the potential link between natural disasters and terrorism, data on natural disasters have been accessed from the Emergency Events Database (EM-DAT) produced by the Centre for Research on the Epidemiology of Disasters (CRED). These data were collected from numerous United Nations agencies, nongovernmental organizations, insurance companies, research institutes, and press agencies (CRED, 2010). In cases where the details of a given disaster differ, the data collected from UN agencies, governments, and the International Federation of Red Cross and Red Crescent Societies were given priority (CRED, 2010). Within this database, for an event to be classified as a natural disaster it must meet at least one of the following operational criteria:

- I. 10 or more people killed
- II. 100 or more people affected
- III. Declaration of a state of emergency
- IV. Call for international assistance (CRED, 2010).

For this thesis, data were obtained pertaining to natural disasters that occurred in Turkey between June 1987 and December 2011, comprising 88 separate natural disasters. The data include information on the type of disaster, its start and end date, its location, and the number of deaths attributed to it. While the present analysis is concerned with the timing and location of natural disasters within Turkey, these other factors are used to ascertain whether any observed relationship is conditioned by the magnitude (number of deaths, duration, and type) of a given natural disaster. The complete list of the variables and their operationalization can be found at the end of this section in Table 1.

In order to measure whether the Turkish Government's response to a given natural disaster was seen to be adequate, a systematic search was made of Reuters News articles using the search syntax <Turk*> in the Factiva database. This search yielded 104,909 articles in total for the period between June 1987 and December 2011. The lead sentences from each of these articles were then extracted from this pool of articles, and were used to ascertain the perceived adequacy of the government's response. Previous research has suggested that the lead sentences from Reuters articles are consistent with the narrative that is contained within the full article, and are also able to identify major trends in conflict within this geographic region (Schrodt and Gerner, 1994). From this sample, lead sentences were identified that made reference to a natural disaster by searching for the words 'disaster', 'earthquake', 'flood', 'temperature', 'epidemic', 'landslide', or 'avalanche' in line with the EM-DAT typology of natural disasters (CRED, 2010).³ This search yielded 10,332 lead sentences, which were coded as to whether each article presented that the Turkish Government's response was adequate, inadequate, or whether it indicated no opinion.

As this study only coded the lead sentence of each article and not the entire article, in the vast majority of cases a value judgment regarding the adequacy of the government's response was not found directly in the lead sentence. As such, lead sentences were coded as adequate if the lead sentence described the response in a positive manner or reported a positive outcome, and negative if the lead sentence described the

³ It was evident from the Reuters articles that were collected other natural events occurred that were excluded from the EM-DAT database. For example, forest fires and floods did occur in the southeast during the time period being examined, however these events did not reach the thresholds required by the EM-DAT database for being classified as a natural disaster. Many of these events happened in uninhabited areas and affected less than 100 people however, and it is unlikely that these events would have had the same if any impact as the larger events that were included in this dataset and were classified as natural disasters. As such, these natural events are excluded from the measures for natural disasters and the perceived adequacy of response.

response in a negative manner or reported a negative outcome. In cases where both positive and negative outcomes were mentioned, these lead sentences were coded as no opinion. Positive outcomes included; returning vital resources to an area, successfully rescuing individuals, limiting the geographic spread of the damage, and general positive statements. Negative outcomes included; failed attempts to rescue individuals, failed attempts to restore resources to an area, claims that the government didn't respond at all, allegations of corruption, and general negative statements. While this measure is not ideal, if these measures were limited to only direct claims regarding the perceived adequacy specifically then there would not be sufficient variation to conduct any worthwhile analysis. While unavailable to the present study, methods that are able to capture sub-national variation with regard to the perception of the response to a natural disaster be incorporated into the methods employed by future studies would present a large improvement over the current methods. For example, interviews or consistent polling of the public's perceptions of these issues would be invaluable for this purpose. It should also be noted however that news articles that referred to natural events that did not meet the requirements to be classified as a natural disaster according to the above EM-DAT criteria but were referred to using this terminology were excluded. The following lead sentences represent examples of each category:

- I. Adequate - Workers rescued an 11-year-old boy from the ruins of an apartment block in southern Turkey on Sunday, a day after he was trapped in an earthquake (6/28/98)
- II. Inadequate - Frustrated Turks accused the government and military of not doing enough to rescue victims of an earthquake that killed nearly 3,500 people and injured more than 16,000. Survivors said the authorities had failed to send any professional rescuers to areas outside Istanbul and Izmit, the two main cities devastated by Tuesday's quake. Thousands were believed still trapped in the rubble (8/18/99)

III. No Opinion - An earthquake measuring 5.3 on the Richter scale hit Turkey's western province of Izmir on Thursday, state-run Anatolian news agency said. (7/9/98)

As the government response to numerous natural disasters during this period was only reported in either a positive or negative fashion in many cases, a ratio could not be constructed for this measure. Instead, the adequacy of the Turkish Government's response was calculated as a count of the number of articles that present a favorable opinion of the government's response minus the number of articles that present an unfavorable opinion of the government's response to the disaster.⁴ As such, it should be noted that the magnitude of these scores is subject to any bias inherent to the media attention that was paid to each respective natural disaster by Reuters during this period. While subsequent research is required in order to evaluate how accurately Reuters News reflects the attitudes and perspective of the Turkish public, the inclusion of an element in this measure that is able to account for the volume of articles regarding the government response helps to capture the prominence of this issue within the public's attention (Adams, 1986). Between June 1987 and December 2011, 252 Reuters News articles made reference to the adequacy of the Turkish Government's response to a natural disaster and were individually coded to calculate the perceived adequacy of the government's response. Although this presents a large exclusion rate from the original 10,332 sentences that produced by the aforementioned search, in the vast majority of cases language pertaining to natural disasters was used for its metaphorical value within

⁴ Articles that expressed no opinion on the adequacy of the government's response were excluded from this calculation.

these lead sentences (I), referred to international events that involved Turkey (II), or were referring to non-natural disasters (III).

- I. The Turkish central bank absorbed 11.8 trillion lira at 50 percent, after the money market was *flooded* by 36 trillion lira from maturing T-bills (5/3/1995).
- II. More than 1,450 people were killed and 4,400 injured on Tuesday when Japan's worst *earthquake* in nearly half a century caused massive damage and touched off many fires in and around the southern port of Kobe... March 1970, Gebiz, *Turkey*: More than 1,100 killed. (1/17/1995)
- III. Turkey's new incursion into Iraq spotlights the shortcomings of its big push in March and could spell *disaster* for plans to secure the border with the help of Iraqi Kurds, diplomats and Iraqi Kurds said on Friday (7/7/1995).

In line with the above hypotheses concerning whether there is any geographic variation within the relationship between the perceived adequacy of the government's response to a natural disaster and subsequent terrorism, some of the following models will include separate measures for the perceived adequacy for natural disasters that occurred in the Southeast and for those that occurred outside of the southeast. A complete list of all of the variables is included at the end of this section in Table 1.

3.3 Controls

In order to better compare the findings generated by this thesis with the existing study conducted by Berrebi and Ostwald (2011), the control variables used for the following analysis were constructed in a parallel manner to the previous scheme. Further the control variables that were selected are in line with the extant literature regarding the social, political, and economic contexts that influence terrorism activity and disaster effects (Berrebi and Lackdawalla, 2007).

All data for the following variables were sourced from the World Bank's World Development Indicators database (2013) in order to control for elements of demographic and economic yearly variation during this period for all of Turkey. The specific controls that were incorporated for the forthcoming analysis are: percentage of working population unemployed, gross domestic product per capita in constant 2000 US Dollars, gross consumption expenditures as a percentage of gross domestic product (GFCE), foreign direct investment as a percentage of GDP, and Development Assistance Committee country inflows as a percentage of GDP (DAC). The complete list of the variables and their operationalization can be found at the end of this section in Table 1. Both population and urbanization are included as controls as they directly impact the magnitude of the consequences of a natural disaster (Kennedy, 2002). Further, GDP per capita is also included as a control variable as it has been considered to be an adequate proxy for a country's ability to mitigate the effects of a disaster and other development indicators (Berrebi and Ostwald, 2011). Government consumption expenditures are also used to measure of the size of the government, and have also been used previously as a proxy for the degree of "government intrusiveness" into societal affairs (Robison et al.

2006; Berrebi and Ostwald, 2011). The level of foreign investment and DAC country inflows are used to control for participation in the global economy and forces of globalization (Fearon and Laitin, 2012).

Finally, it should also be noted that these control variables only capture yearly variation within Turkey. While this represents the best available data available regarding these measures in Turkey from a politically neutral source, any findings specifically related to the relationship between these control variables and the outcome should be treated with great caution. The standard errors for these estimates will be smaller than they would be if monthly variation was observed. Consequently, with smaller standard errors significance levels will be exaggerated leading to possible Type I errors. Despite this limitation, it is important that these nation-level characteristics be controlled for as they represent the major correlates of terrorism globally and their exclusion from the following models would potentially bias subsequent estimates as they are also correlated with the perceived adequacy of the government's response to a natural disaster (Fearon and Laitin, 2012).

In order to control for the potential impact of previous responses to natural disasters, a variable was also created to measure the cumulative perceived adequacy of responses during the previous 12 months. This variable was calculated by summing the adequacy scores described above for the twelve previous months. In order to differentiate between the varying impact of responses in the southeast of Turkey compared to the rest of the nation, this measure was calculated separately for disasters that occurred in each of these areas. Further, to account for the magnitude of the grief that was experienced by the communities affected by a natural disaster, and to control for the impact of reporting the

number casualties alongside opinions of the government response within the lead sentences, the number of people killed in a natural disaster is also included in the subsequent analysis. Potential multicollinearity between the presence of a natural disaster and the number of people killed is assessed.

3.4 Operationalization

Below is a table that provides the operational definitions and sources for all variables contained within the subsequent analysis.

Table 1: List of variables, their operationalization, and the source from which they were drawn.

Variable	Operational Definition	Source
Act of Terrorism	Frequency of terrorist attacks in a month.	GTD
Kurdish Act of Terrorism	Frequency of terrorist attacks that were attributed to an organization with ties to the Kurdish people in a month.	GTD
Non-Kurdish Act of Terrorism	Frequency of terrorist attacks that were not attributed to an organization with ties to the Kurdish people in a month.	GTD
Natural Disaster	Frequency of natural disasters in a month.	EM-DAT
Perceived Adequacy	The count of the number of articles that present a favorable opinion of the government's response minus the number of articles that present an unfavorable opinion of the government's response to the specific disaster.	Reuters
Southeast Disaster	The count of the number of articles that present a favorable opinion of the government's response minus the number of articles that present an unfavorable opinion of the government's response that occurred in the southeast in a month.	EM-DAT, Reuters, UN, Google News
Non-Southeast Disaster	The count of the number of articles that present a favorable opinion of the	EM-DAT, Reuters, UN,

	government's response minus the number of articles that present an unfavorable opinion of the government's response that occurred outside of the southeast in a month.	Google News
Killed	Frequency of persons confirmed as dead and persons missing and presumed dead due to a natural disaster in a month.	EM-DAT
Southeast adequacy over the last twelve months	The summation of articles that present a favorable opinion of the government's response minus the number of articles that present an unfavorable opinion of the government's response to specific disasters that occurred in the southeast over the previous 12 months.	Reuters
Non-Southeast adequacy over the last twelve months	The summation of articles that present a favorable opinion of the government's response minus the number of articles that present an unfavorable opinion of the government's response to specific disasters that occurred outside of the southeast over the previous 12 months.	Reuters
Population (Millions)	Frequency of all residents of legal status, except for refugees not permanently settled in country of Asylum, measured in millions.	Turkish Statistical Institute and The World Bank
Election Year	1 if month in an election year 0 otherwise	The World Bank
Percentage of Working Population Unemployed	Percentage of the labor force that is without work but available for and seeking employment.	The World Bank
Gross Domestic Product per capita in constant 2000 Billion US Dollars	The sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products (Billion US Dollars).	The World Bank
Gross government final consumption expenditures as a percentage of GDP (GFCE)	Percentage of all government current expenditures for purchases of goods and services.	The World Bank
Foreign direct investment as a percentage of GDP	Percentage of the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that	The World Bank

	of the investor.	
Development Assistance Committee (DAC) country inflows as a percentage of GDP.	Percentage of loans made on concessional terms and grants made to promote economic development and welfare in countries and territories in the DAC list of ODA recipients.	The World Bank

4 Methods

The analysis begins by presenting the trends of terrorist attacks and natural disasters within Turkey between 1987 and 2011. Following these temporal and geographic descriptions, the perceived adequacy of the Turkish Government's responses to these disasters is also presented.

In order to test the four hypotheses each model is estimated using an Autoregressive Poisson regression. As the dependent variable is a rare event that measures the number of terrorist attacks in a given month, Autoregressive Poisson regression is selected as it corrects for autocorrelation (Schwarz et al., 1996; Katsouyanni, et al., 1996).

Recall that hypothesis 1 includes one testable hypotheses: The perceived adequacy of the government's response to a natural disaster is inversely related to the number of subsequent terrorist attacks within Turkey. To test these hypotheses, an autoregressive Poisson is run using the following equations:

$$(1) \quad \text{Log}(Terrorism_{t+1}) = \alpha_t \circ y_t + \varepsilon$$

$$\text{where: } \alpha_t = \log(\beta_1 \text{adequacy} + \beta_5 \text{killed} + \beta_6 \text{controls})$$

In the above models, α_t refers to the logistic distribution function of the relevant independent variables at time point t . The subscripts t and $t+1$ show whether the variable was measured, during the current month or following month respectively. The $\alpha_t \circ y$ operator represents the autoregressive process. The ε is assumed to be independently and identically distributed Poisson with mean $\lambda > 0$ and independent of y_{t+1} . Within this model, if hypothesis 1a is supported, the coefficient estimate for β_1 will be both positive

and statistically significant. If hypothesis 1b is supported, the coefficient estimate for β_1 will be both negative and statistically significant.

Recall that hypothesis 2 includes two testable hypotheses: a) The perceived adequacy of the government's response to a natural disaster is inversely related to the number of subsequent Kurdish terrorist attacks within Turkey; and b) Regardless of the adequacy of the government response, natural disasters is unrelated to subsequent acts of non-Kurdish terrorism. To test these hypotheses, an autoregressive Poisson is run using the following equations:

$$(2a) \text{ Log}(Kurdish\ Terrorist_{t+1}) = \alpha_t \circ y_t + \varepsilon$$

where: $\alpha_t = \log(\beta_1 \text{adequacy} + \beta_2 \text{previous_adequacy} + \beta_5 \text{killed} + \beta_6 \text{controls})$

$$(2b) \text{ Log}(Non-Kurdish\ Terrorist_{t+1}) = \alpha_t \circ y_t + \varepsilon$$

where: $\alpha_t = \log(\beta_1 \text{adequacy} + \beta_2 \text{previous_adequacy} + \beta_5 \text{killed} + \beta_6 \text{controls})$

If hypothesis 2a is supported, the coefficient estimate for β_1 will be both negative and statistically significant. If hypothesis 2b is supported, the coefficient estimate for β_1 will not be statistically significant.

The third and fourth hypotheses explored by this thesis are concerned with determining whether there is any sub-national geographic variation within in the relationship between the adequacy of the response to a natural disaster on subsequent terrorism. Recall that hypothesis 3 includes two testable hypotheses: a) The perceived adequacy of the government's response to a natural disaster that occurred in the southeast is inversely related to the number of subsequent Kurdish terrorist attacks within Turkey;

and b) Natural disasters that occur in the Kurdish southeast are unrelated to subsequent acts of non-Kurdish terrorism regardless of the adequacy of the government response. Further, hypothesis 4 also includes two testable hypotheses: a) The government's response to a natural disaster that occurred outside of southeastern Turkey is positively related to the number of subsequent Kurdish terrorist attacks; and b) Natural disasters that occur outside of southeastern Turkey is unrelated to subsequent acts of non-Kurdish terrorism regardless of the adequacy of the government response. To avoid potential omitted variable bias, hypotheses 3 and 4 are tested simultaneously. As with the above equations (2a and 2b), these hypotheses are also further divided in order to differentiate between Kurdish and non-Kurdish terrorism. To test these hypotheses, an autoregressive Poisson is run using the following equations:

$$(3a) \text{ Log(Kurdish Terrorism}_{t+1}) = \alpha_t \circ y_t + \varepsilon$$

$$\text{where: } \alpha_t = \log(\beta_1 \text{SEAdequacy} + \beta_2 \text{NonSEAdequacy} + \beta_3 \text{SEPreviousAdequacy} + \beta_4 \text{NonSEPreviousAdequacy} + \beta_5 \text{killed} + \beta_6 \text{controls})$$

$$(3b) \text{ Log(Non-Kurdish Terrorism}_{t+1}) = \alpha_t \circ y_t + \varepsilon$$

$$\text{where: } \alpha_t = \log(\beta_1 \text{SEAdequacy} + \beta_2 \text{NonSEAdequacy} + \beta_3 \text{SEPreviousAdequacy} + \beta_4 \text{NonSEPreviousAdequacy} + \beta_5 \text{killed} + \beta_6 \text{controls})$$

If hypothesis 3a is supported, the coefficient estimate for β_1 in equation 3a will be both negative and statistically significant. If hypothesis 3b is supported, the coefficient estimate for β_1 will not be statistically significant within equation 3b. Further, if hypothesis 4a is supported, the coefficient estimate for β_2 in equation 3a will be both positive and statistically significant. If hypothesis 4b is supported, the coefficient estimate for β_1 in equation 3b will not be statistically significant.

This thesis postulates that acts of terrorism that rationally arise due to government responses to natural disasters would likely take some time to manifest (Kavanagh, 2006), and that this relationship changes over time (Perry and Lindell, 2003). As it is unknown what period of time would be appropriate for this response following a natural disaster, sensitivity analyses are conducted by estimating the effects using multiple lags. In all cases, monthly lags are sequentially tested ranging from 0 to 12 months. Based upon the findings of these sensitivity tests (Appendix A), all of the following hypotheses are estimated with one-month lags.

5 Results

As the terrorism of a nation and the severity and frequency of natural disasters can vary immensely, this findings section begins by presenting the descriptive statistics for the primary dependent and independent variables that were used in the subsequent analyses.

5.1 Terrorism in Turkey

According to the GTD, there were 2,187 terrorist attacks that occurred in Turkey between June 1987 and December 2011. Of these attacks, 1,076 (49.2%) were attributed to organizations affiliated with the Kurdish people. These attacks by Kurdish related groups were responsible for the deaths of 3,594 people, comprising 81.8% of all of the deaths from terrorism in Turkey (n=4395). The trend of the total terrorist attacks and Kurdish Terrorist attacks can be seen below in Figure 3. At least three major peaks in terrorism can be observed during this period occurring in 1992, 1994, and 1999, with the volume of attacks reducing in magnitude after this final peak. While the monthly frequencies of terrorism and Kurdish terrorism follow similar trajectories throughout the period being examined, groups without recorded ties to the Kurdish people did commit the vast majority of the terrorist attacks during 1991. Kurdish terrorist groups committed only 83 (28.3%) of the 293 attacks that occurred in this year. Even in this year however, Kurdish attacks proved to be more lethal and accounted for 174 (56.95%) of the 306 terrorism fatalities.

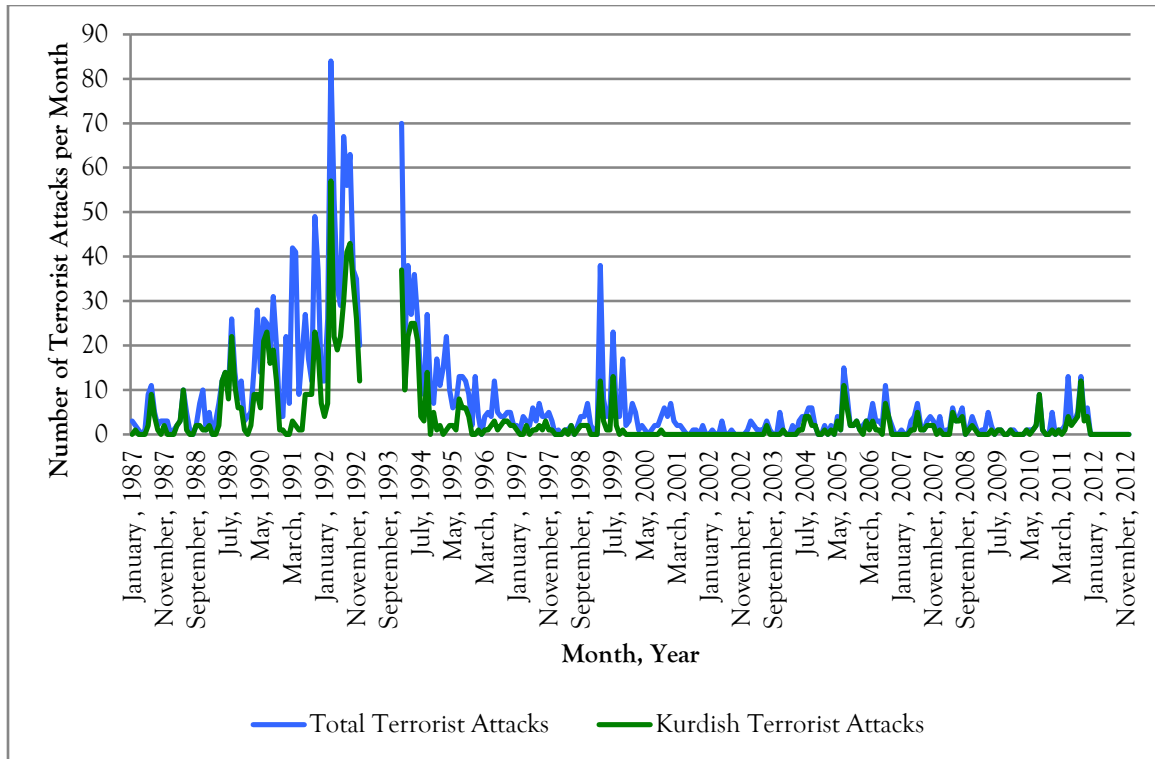


Figure 3: Distribution of Terrorist Attacks in Turkey (1995-2001)

5.2 Natural Disaster Profile

Between June 1987 and December 2011, Turkey experienced 88 natural disasters that occurred across 77 separate months (Figure 4). During this period, 21,100 people were killed by natural disasters in Turkey, with 8 individual natural disasters resulting in the deaths of more than 100 people respectively. Out of the 271 months in the present sample, one natural disaster was experienced in 65 months, 11 months had two natural disasters, and three natural disasters occurred in March 2004. Earthquake was the modal disaster type for this period, with 31 occurring in Turkey, followed by floods ($f=29$). It is also evident that the types of natural disasters varied between the southeast of Turkey and the rest of the nation, with more than twice as many floods occurring outside of the southeast and as all recorded forest fires and landslides that met the EM-DAT criteria for natural disasters. The full distribution of disaster types divided by region can be seen

below in Figure 5. A total of 21,097 people were killed by these natural disasters, with the vast majority of these (f=17,127) occurring due to the Marmara earthquake that occurred in August 1999. According to the data sourced from EM-DAT, an estimated 6,107,363 people were directly affected, and more than \$26.7 billion (\$US) damage was caused by the natural disasters that occurred during this period. These estimates should be viewed however as a lower bound for the impact of natural disasters in Turkey however due to problems with estimating populations affected due to temperature fluctuations and disease. Out of the 88 natural disasters, 36 occurred in southeast Turkey (40.9%).

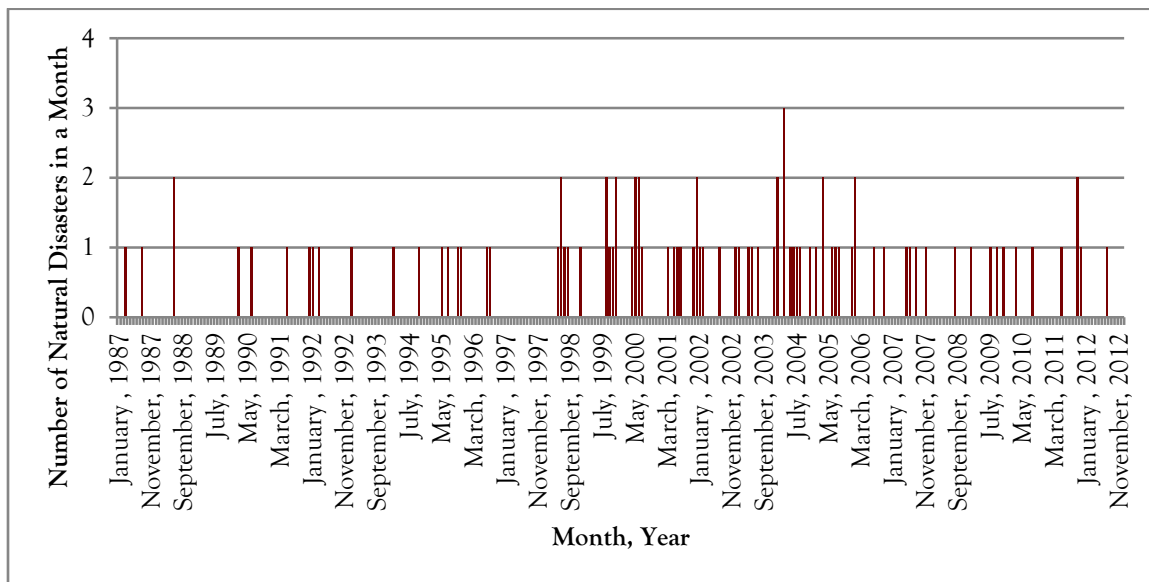


Figure 4: Natural Disasters Occurring in Turkey 1987-2011 (CRED, 2010)

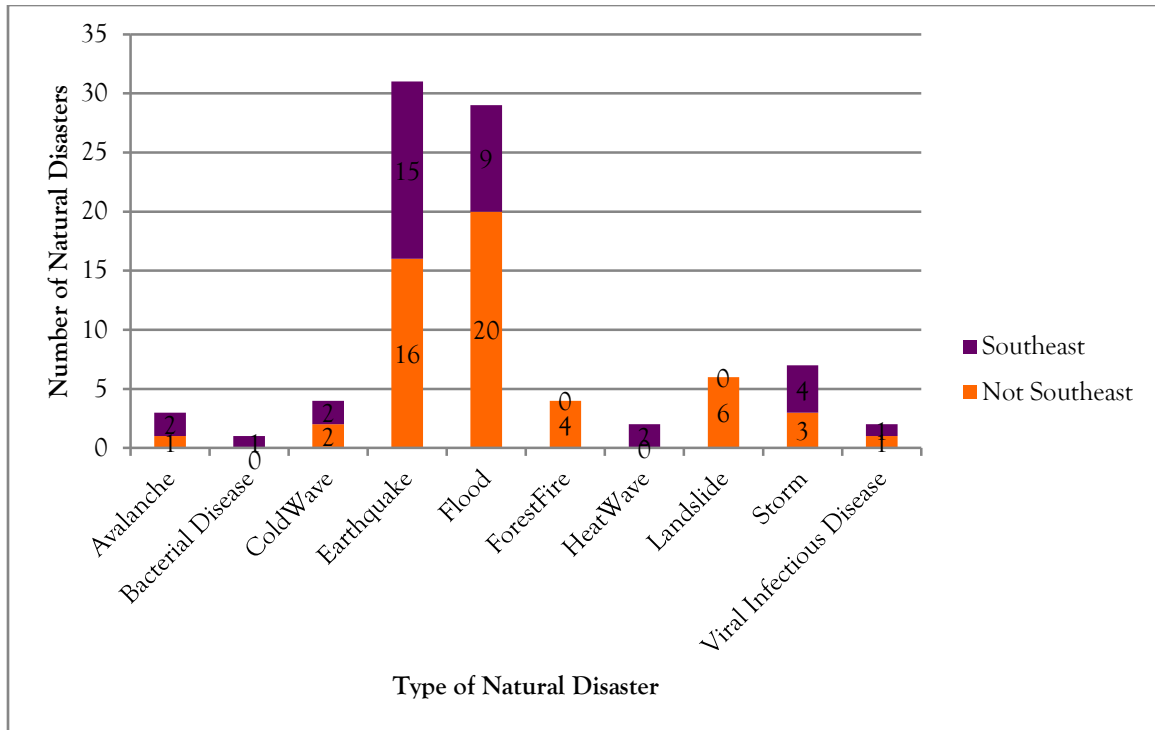


Figure 5: Types of Natural Disasters that occurred in Turkey 1987-2011

Every natural disaster that occurred during the sampling period and met the above requirements according to the EM-DAT database⁵ had at least one Reuters News article that made reference to the adequacy of the Turkish Government's response. Overall, the distribution of the adequacy scores ranged between -11 and +5 and can be seen to be mound shaped with a slight negative skew and centered around 0 (Figure 6). After calculating the adequacy of the government's response, 37 out of the 88 natural disasters (42.0%) were coded as being handled in a positive manner. Nearly half of these however had a final adequacy score of +1 however (n=18, 48.7%), with two natural disasters having the most positive score that was observed at +5. The remainder of the natural disasters were recorded as having negative scores for the government's response (n=51,

⁵ A naturally occurring phenomenon that: killed 10 or more people, affected more than 100 people, prompted the declaration of a state of emergency, or prompted a call for international assistance.

51.3%). Across all of the disasters, the average adequacy of the government's response was -0.83 and the sum of all of the adequacy scores during this period was -73.

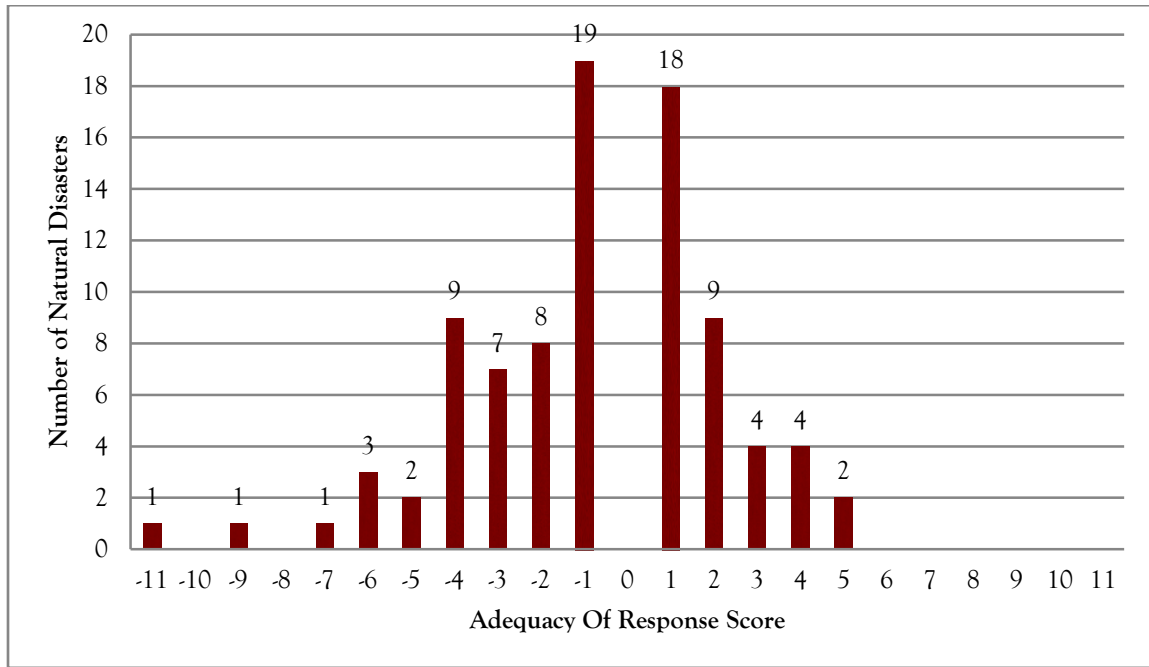


Figure 6: Adequacy of Government Response to Natural Disasters 1987-2011

Despite the three worst adequacy scores being recorded for natural disasters that occurred outside of the southeast of Turkey, both regions had nearly numerically identical adequacy score means ($\bar{x} = -0.8302$ for not-southeast vs. $\bar{x} = -0.8286$ for southeast). Offset by also having the two highest adequacy scores (+5), the non-southeast also had the majority of articles that commented upon the adequacy of the government's response in the sample (n=158, 62.7%). Twenty out of the 36 natural disasters that occurred in the southeast had a calculated adequacy score that was negative (55.6%), compared to 31 out of the 52 that occurred outside of this region (59.6%). The full distribution of these adequacy scores across the two regions can be seen below in Figure 7.

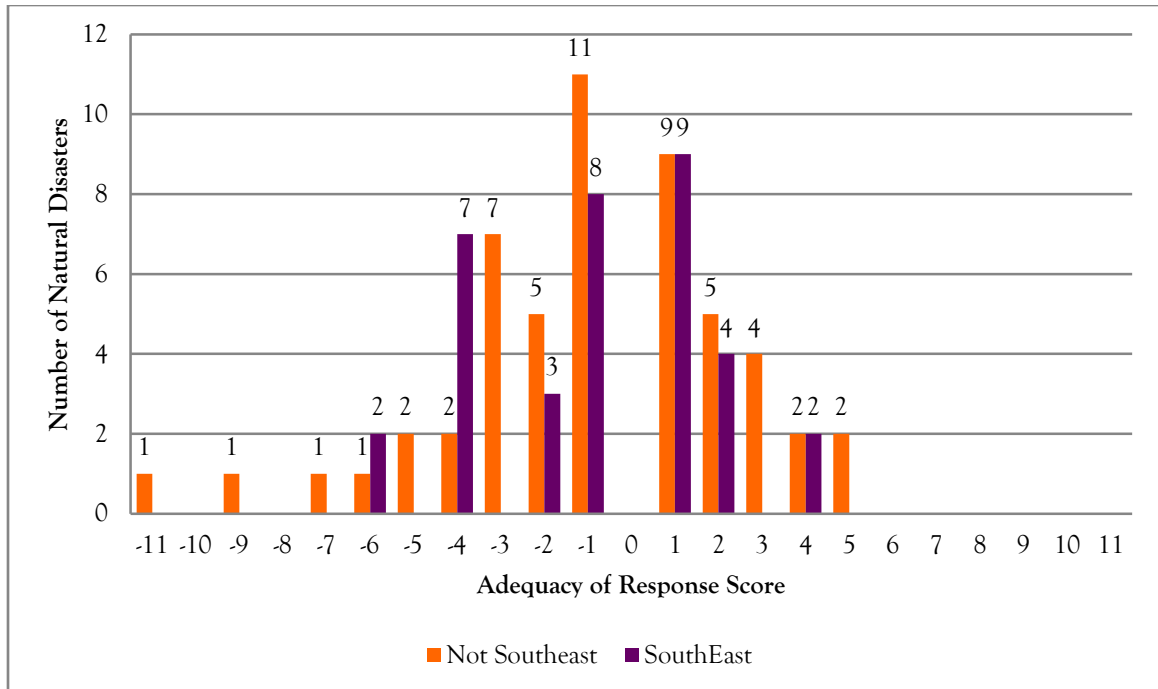


Figure 7: Adequacy of Government Response to Natural Disasters 1987-2011 by Location

When these adequacy scores were calculated for each individual month in the sample, the monthly scores ranged between -15 and +5. Although there does not appear to be any observable trend in the monthly adequacy scores (Figure 8), only four of the 12 months that had multiple disasters contained adequacy scores that were both positive and negative. Thus, for the eight months in the sample the monthly adequacy of the government response was found to be greater in magnitude than any of the individual responses, accounting for the score of -15 observed in August 1999. Further, for no month in the sample did the monthly adequacy score for all of Turkey, or for any region, sum to 0 unless no natural disaster was observed for this month. When the adequacy was divided by region however (Figure 9), it was evident that the perceived adequacy did follow some trends during the observed time period. For example, between July 2000 and May 2007 only two out of the 16 natural disasters (12.5%) that occurred in southeast

Turkey had a positive perceived adequacy score, and the combined adequacy score was -32 for this period ($\bar{x} = -2$). During the same period however, 10 out of the 19 natural disasters (52.6%) that occurred in the non-southeast had a positive perceived adequacy score, with a combined adequacy score of -1 ($\bar{x} = -0.053$).

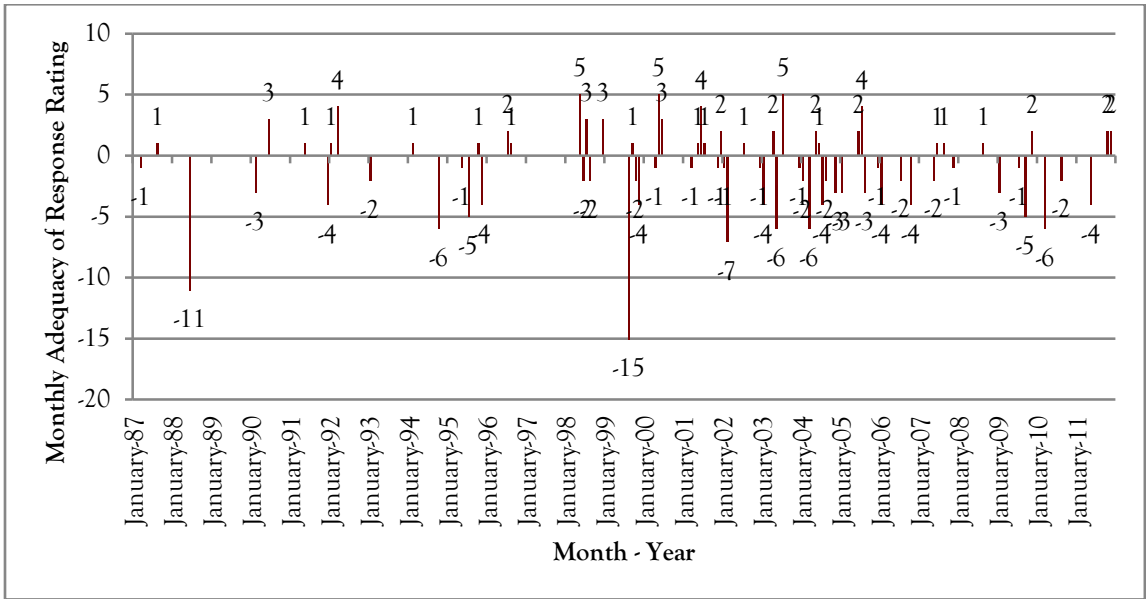


Figure 8: Monthly Adequacy of Government Response (1987-2011)

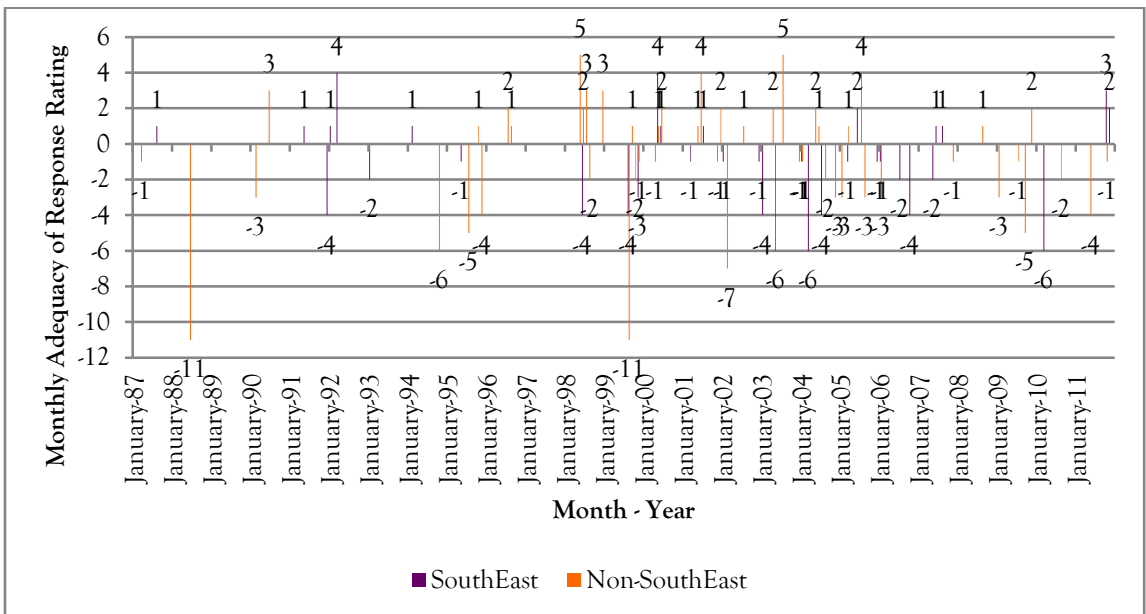


Figure 9: Monthly Adequacy of Government Response by Location (1987-2011)

5.3 Natural Disasters and Subsequent Terrorism

The first hypothesis posited by this thesis concerned the perceived adequacy of the response had upon terrorism in the following month.⁶ Model 1 in Table 2 revealed that the perceived adequacy of a government's response to a natural disaster was associated with an increase in the likelihood of a terrorist attack in the following month (IRR=1.074). Although this finding is contrary to the hypothesized relationship, had a two-tailed hypothesis been used, it would have been statistically significant. The calculated IRR shows that for every unit increase in the perceived adequacy of the response to a natural disaster is expected to increase the rate of subsequent terrorism in Turkey by 1.074 times while holding the other variables constant in the model ($p < 0.05$). Consequently, this thesis does not find support for hypothesis 1b that predicted that the perceived adequacy of the response to a natural disaster would be negatively related to subsequent terrorism within Turkey.

⁶ One of the key questions posed by this thesis concerned how long the lag would be between the occurrence of a natural disaster and the influence that it would have on subsequent terrorism. In order to evaluate this, a series of Autoregressive Poisson regressions were run using between 0 and 12 lags, sequentially. This sensitivity analysis was run for all models that are discussed, and the complete findings are presented in Appendix A. Based on this analysis, it was concluded that the most appreciable impact of the perceived adequacy of the response to a natural disaster could be observed in the month following the natural disaster.

Table 2: Autoregressive Poisson Coefficient Estimates and Standard Errors for Lagged Natural Disasters and Adequacy of Response on Terrorism

	Model 1	Model 2	Model 3
	Hypothesis 1 All Terrorism	Hypothesis 2a Kurdish Terrorism	Hypothesis 2b Non-Kurdish Terrorism
	β (SE)	β (SE)	β (SE)
Disaster			
Adequacy	0.0714 (0.036)	0.170 (0.048)	0.044 (0.042)
Killed	0.0001 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
GDP (Billions)	0.0001 (0.0005)	0.003** (0.0001)	-0.001 (0.0008)
Population (Millions)	-0.278** (0.322)	-0.387** (0.428)	-0.182 (0.408)
GFCE	0.486** (0.043)	0.491** (0.058)	0.492** (0.053)
Foreign Investment	0.205 (0.116)	0.197 (0.149)	0.246 (0.146)
DAC	-0.205** (0.078)	-0.633** (0.113)	-0.037 (0.091)
Unemployment (%)	0.011 (0.012)	0.071** (0.019)	-0.020 (0.012)
Election Year	0.210** (0.061)	0.347 (0.061)	0.347 (0.061)
Constant	12.634 (2.222)	15.890 (2.840)	7.508 (2.853)

^op ≤ .10; *p ≤ .05; **p ≤ .01 (one-tailed tests).

Seeking to explore whether the relationship between the perceived adequacy of a natural disaster had a varying impact on different types of terrorism (hypotheses 2), models 3 and 4 in Table 2 test this relationship on Kurdish (hypothesis 2a) and non-Kurdish terrorism (hypothesis 2b) respectively. This thesis did not find support for hypothesis 2a as the coefficient is opposite in expectation, however with every unit increase in the perceived adequacy of the response to a natural disaster was found to lead to an expected increase in the rate of subsequent Kurdish terrorism in Turkey by 1.185 times for Kurdish terrorism. Once again however, had a two-tailed hypothesis been used, this result would have been statistically significant (p<0.001). The findings for hypothesis 2b however were in line with those predicted, as non-Kurdish terrorism is unrelated to the previous month's perceived adequacy after controlling for the other variables in the model.

The final two hypotheses offered by this thesis are concerned with observing whether the impact of the adequacy of the response to a natural disaster upon terrorism varied geographically within Turkey. Focusing upon natural disasters that occurred within southeastern Turkey, Models 1 and 2 in Table 3 contain the estimated coefficients and the robust standard errors for Kurdish and Non-Kurdish Terrorism within Turkey between 1987 and 2011. This thesis found support for hypothesis 3a, with the perceived adequacy of the response to a natural disaster that occurred in the southeast in the previous month being found to be negatively related to Kurdish terrorism ($p < 0.001$). As such, this thesis finds support for hypothesis that the perceived adequacy to a natural disaster that occurred in the southeast of Turkey would be negatively related to subsequent Kurdish terrorism. It appears that for natural disasters occurring in the southeast of Turkey that the rate of terrorism decreased by a factor of 0.818 for every one-unit increase in the perceived adequacy of the government's response.

As predicted by hypothesis 3b, Model 2 indicated that the adequacy of the perceived response to a natural disaster had no evident impact on non-Kurdish Terrorism once the location of the disaster was included in the model. When looking at all of the terrorism that occurred in Turkey however, the adequacy of the response that occurred in the previous month was statistically significant within Model 3, and was positively related to all subsequent terrorism that occurred in Turkey (IRR=1.078, $p=0.038$).

Table 3: Autoregressive Poisson Coefficient Estimates and Standard Errors for Lagged Adequacy of Response on Terrorism

	Model 1	Model 2	Model 3
	Hypotheses 3a & 4a Kurdish Terrorism	Hypotheses 3b & 4b Non-Kurdish Terrorism	All Terrorism
	β (SE)	β (SE)	β (SE)
Southeast Adequacy	-0.200** (0.047)	0.015 (0.042)	0.074* (0.036)
Non-Southeast Adequacy	0.139* (0.077)	-0.011 (0.049)	-0.045 (0.049)
Southeast Previous 12 Months	-0.061* (0.032)	0.009 (0.023)	0.006 (0.022)
Non-Southeast Previous 12 Months	0.045* (0.21)	0.002 (0.016)	0.018 (0.014)
Killed	-0.004 (0.009)	0.0006 (0.0009)	0.0003 (0.0007)
GDP (Billions)	0.004** (0.0006)	-0.0001° (0.0007)	0.001° (0.0005)
Population (Millions)	-0.384** (0.042)	-0.180** (0.043)	-0.282** (0.033)
GFCE	0.411** (0.061)	0.497** (0.059)	0.460** (0.047)
Foreign Investment	0.154 (0.143)	0.279° (0.149)	0.191 (0.114)
DAC	-0.692** (0.111)	-0.035 (0.097)	-0.342** (0.080)
Unemployment (%)	0.694** (0.018)	-0.019 (0.013)	0.010 (0.012)
Election Year	0.743** (0.235)	0.813** (0.165)	0.771** (0.151)
Constant	16.770 (2.823)	7.514 (2.995)	13.362 (2.279)

°p ≤ .10; *p ≤ .05; **p ≤ .01 (one-tailed tests).

In line with the predictions of hypothesis 4a, the adequacy of the response to natural disaster was positively related to subsequent Kurdish terrorism ($p < 0.04$). This result suggests that for every unit increase in the perceived adequacy of the response to a natural disaster that occurred outside of the southeast is expected to increase the rate of subsequent Kurdish terrorism in Turkey by 1.149 times while holding the other variables constant in the model. Support was also found for hypothesis 4b that posited that natural disasters that occurred outside of southeastern Turkey would be unrelated to subsequent acts of non-Kurdish terrorism regardless of the adequacy of the government response ($p = 0.707$).

It should finally be noted that there is also evidence that the better the perceived adequacy of the responses to a natural disaster over the previous 12 months outside of the southeast of Turkey were associated with an increase in the rate of Kurdish terrorism (IRR=1.046, $p<0.05$), and that responses to a natural disaster over the previous 12 months within the southeast of Turkey were associated with a decrease in the rate of Kurdish terrorism (IRR=0.941, $p<0.05$).

6 Conclusions

Expanding upon the previous research connecting natural disasters to terrorism, this study was the first to investigate whether the perceived adequacy of a state's response to a natural disaster impacts future acts of terrorism. No support was found for the first hypothesis that predicted a negative relationship between the perceived adequacy of the response to a natural disaster and subsequent terrorism. Consequently, this thesis provides evidence that it is the perceived adequacy of the response to a natural disaster that impacts subsequent acts of terrorism at the nation-level within Turkey.

Positing that ethno-nationalist terrorist organizations are more reactive to the adequacy of a government's response to a natural disaster, the findings from this thesis also indicate that there were observable differences between Kurdish and non-Kurdish terrorism within Turkey during this period. Seeking to observe whether the perceived adequacy of the response to a natural disaster had a differential impact on Kurdish terrorism compared to non-Kurdish terrorism within Turkey, this thesis failed to find support for a negative relationship between perceived adequacy and subsequent Kurdish terrorism at the nation level. It was found however that there was no observable relationship between subsequent non-Kurdish terrorism and the perceived adequacy of the response to a natural disaster in line with the original hypothesis. There was a positive association that was observed between the perceived adequacy of the government's response and Kurdish terrorism had a two-tailed hypothesis been used. Although this finding should be understood in light of the more flexible models discussed below, these post-hoc explorations do suggest that the relationship between natural disasters and the subsequent response had a different impacts on ethno-nationalist terrorism within Turkey.

Although not predicted by this study, it should also be noted that there was also evidence found that non-Kurdish terrorism was affected by the perception of the government's response to a natural disaster after the first month. Sensitivity tests (Appendix A) revealed that the relationship between the perceived adequacy of response and non-Kurdish terrorism was more volatile compared to Kurdish terrorism, and was negatively related to the adequacy of the response after two and five months, and positively related after ten months. Thus, beyond ethno-nationalist terrorism, this thesis also provides some evidence to suggest that other types of terrorism were also influenced by the response to a natural disaster within Turkey. Consequently, it appears that both the magnitude and duration of the impact of the government's response varied across different types of terrorism at the nation-level. While these findings disappeared after the location of the natural disaster was taken into account, this avenue of research also merits further analysis within Turkey and other contexts.

The ability to differentiate between natural disasters that occur within different regions of Turkey was found to be especially important by this study. After accounting for the region where the natural disaster took place, Kurdish terrorism in the month following a natural disaster was inversely related to the adequacy of the response to natural disasters occurring within southeastern Turkey. As such, it is evident within these data that responses to a natural disaster in the southeast that are perceived as adequate were associated with a reduction in the rate of Kurdish terrorism within Turkey. Further, this thesis also finds evidence to suggest that adequate responses outside of the southeast were associated with increases in Kurdish terrorism in the following month. While this finding is plausible given the previous literature suggesting that Turkey has previously

redesignated resources from the southeastern Kurdish areas to fund these relief efforts (Kinzer, 1999), further research is still required in order to isolate whether these increases in terrorism are indeed a product of the redistribution of resources. As such, this thesis finds evidence that in addition to quelling the rationale for engaging in acts of terrorism, terrorism may exist as a response that attempts to undermine or distract citizens from the political gains that come from a successful response to a natural disaster in other areas.

Further, as the initial models that combined all disasters indicated that there was a positive and statistically significant relationship between the adequacy of the government response and Kurdish terrorism in the following month (assuming a two-tailed hypothesis), the implications from these data would be very different had this sub-national geographic variation been ignored in the models used by this study. As such, this study finds strong evidence to suggest that observing these impacts at the national level is insufficient to capture the nature of the relationship between natural disasters and various forms of subsequent terrorism. Non-Kurdish terrorism appeared to be unconnected to the response to a natural disaster that occurred in the previous month across all geographic levels as predicted. However, this relationship still requires replication in other settings before concluding that the relationship between the perceived adequacy of a natural disaster and subsequent terrorism is only observable for ethno-national terrorism.

As the above methods only explore one of many ways of observing geographic variation within a nation, other methods of capturing geographic variation should also be used in subsequent research. Different levels of geographic aggregation may be able to further ascertain whether the observed relationships were a product of aggregation, or

whether these impacts are felt differentially depending on where the disaster occurred. It is also recommended that future research employ finer geographic units of analysis attempt to also control for factors such as terrain and access to resources such as water, hospitals, and education that also impact the relationship between natural disasters and subsequent terrorism. Further, the ability to observe this relationship was also limited as control data was only available that captured annual variation.

As the specificity of the existing grievances between the Kurdish people and the Turkish government also limit the generalizability of these findings, this study on its own should not be seen as sufficient to suggest that the link between natural disasters and subsequent terrorism only exists through the adequacy of the government's response for individual nations. For example, the impact on subsequent terrorism may be more pronounced if the natural disaster destroyed vital public infrastructure such as electricity grids, access to water, or hospitals. Despite this, this thesis can inform future policy within Turkey, and possibly other nations that have marginalized populations who have high levels of geographic concentration. Based on the above findings, it appears that when the state is perceived to have not met its obligation to its populace in a time of crisis, groups might resort to terrorism. With this in mind, particularly when grievances exist between a state and a marginalized and geographically concentrated population, this evidence suggests that the response to any natural disaster has implications for subsequent terrorism from ethno-nationalist groups, as adequate responses outside of the southeast also led to higher rates of terrorism. As such, in addition to the practical response to a natural disaster, it may be beneficial for a state to ensure that a strong public message is composed that is sensitive to the grievances of marginalized groups after a

natural disaster. Although untested by this thesis, it is believed that without an adequate response, attempts to sway public perception in such a manner would also result in the aggravation of existing grievances.

This thesis was limited as it was unable to observe and control for monthly variation in the economic and demographic profile of Turkey. Although yearly variation in these correlates of terrorism was included in all models, any potential interactions between these factors and the perceived adequacy of a government's response to a natural disaster were unable to be detected in this thesis. While data availability issues are a common problem faced by researchers seeking to study this region of the globe, this limitation is not trivial given the central role that economic concerns may play in mediating or exacerbating the relationship between a government and its people. Even in cases where data were available, such as for financial estimates for the damage incurred from a natural disaster, these data were unable to be incorporated due to the presence of systematically missing data and estimates that were unable to be confirmed by multiple sources. Consequently, this thesis highlights the need for subsequent research exploring how fluctuation in the financial resources available to the government may further inform the relationship observed in this thesis.

The current method used for estimated the perceived adequacy of government responses to a natural disaster is also only one of many methods that may be used to estimate public perceptions of this phenomenon. Although there is evidence to suggest that the lead sentences that were used for this purpose are able to gauge public perception particularly within the context of terrorism (Norris and Kern, 2013), the present method

was unable to discern between attitudes held by Kurdish and non-Kurdish people within Turkey. Beyond triangulating the results obtained by present method, this thesis also recommends that methods that are able to capture sub-national variation with regard to the perception of the response to a natural disaster be incorporated into the methods employed by future studies. For example, interviews or consistent polling of the public's perceptions of these issues would be invaluable for this purpose.

The findings presented here further affirm the extant literature that suggests that a natural disaster may also be a catalyst for improved relations between a state and its constituency (Hall and Landreth, 1975; Perry and Lindell, 2003; Kaniasty and Norris, 2004). As such, beyond minimizing the direct harms that are incurred from a population impacted by a natural disaster, a timely and well-planned government response that does not detract from other vital public services may also help to reduce the rate of terrorism in the following month. Specifically, observing whether these findings are generalizable to terrorism regarding the Saharawi within Morocco, the Kashmiri within India, the Moros in the Philippines, and the Afars people within Eritrea, which also have high levels of geographic concentration comparable to the Kurdish people, remains an important next step for this body of research (Natali, 2005; Hoffman, 2006, MAR, 2013).

In addition to causing widespread damage and engendering fear within a given society (Peek and Sutton, 2003; Flynn, 2008), the findings in this thesis suggest that natural disasters also impact the rate at which ethno-nationalist terrorism occurs in the following month. Perhaps a state's perceived failure in this duty to its populace can magnify the disaster's economic, political, and social costs, triggering negative

consequences for a state and its citizenry including terrorism (Sönmez, Apostolopoulos, and Tarlow, 1999; Perry and Lindell, 2003; Waugh, 2006). Particularly in nations that affirm that their government has a responsibility for the wellbeing of its populace, how a state responds to a natural disaster may have both positive and negative impacts on subsequent terrorism. Although it is unclear whether this impact also extends to other forms of terrorism within Turkey such as that committed by Islamic and Leftist groups, this thesis has demonstrated that both the location and perception of the response both influence the rates at which terrorism occurs over a 12 month period. Further, it is evident that this relationship is separate from the presence of natural disasters. Consequently, it appears based upon the data used within this study that the relationship between natural disasters and terrorism varies over the course of a year, varies geographically within a nation, and exists through the perceived adequacy of the response.

Drawing upon these findings, it appears that governments play an important role in the response to a natural disaster that is valued by their populace, and that may also mitigate existing tensions and lead to reductions in terrorism committed by groups whose constituency resides in the impacted area. Further, there is some evidence to suggest that this relationship also extends to the perceived adequacy of the response elsewhere in the nation. While future studies will be required in order to establish whether this is due to the removal of vital resources from the constituency of the terrorist group or due to some other factor, it is evident that the adequacy of the response to a natural disaster places a government in a unique position to either mitigate or exacerbate the underlying motivations for terrorism.

7 Appendix A

One of the key questions posed by this thesis concerned how long the lag would be between the occurrence of a natural disaster and the influence that it would have on subsequent terrorism. In order to evaluate this, a series of Autoregressive Poisson regressions were run using between 0 and 12 lags, sequentially in separate models, in order to observe whether this relationship was sensitive to the number of months allowed for a lag and to establish the appropriate model to test the hypotheses raised by this thesis. This sensitivity analysis was run for all models that were discussed within the results section, and the findings are discussed in this appendix.

Focusing firstly on the relationship between the perceived adequacy of the Turkish Government's response to a natural disaster and subsequent terrorism, it was evident that this relationship varied markedly across the lags that were observed. While the coefficients that were produced from this series of autoregressive Poisson regressions were smaller in magnitude compared to those produced above (-0.041 – 0.118 compared to -0.187 – 0.190), the regressions that used one monthly lag and ten monthly lags for the adequacy of response would have both been found to be statistically different from zero within the model had a two-tailed hypothesis been used (Figure 11). Although once again the finding for ten months should be viewed with caution (Box and Jenkins, 1970), the finding for one lag was observed across a number of model specifications and appears to be fairly robust. It should however be emphasized that the coefficients for both one and ten monthly lags were in the opposite direction to that hypothesized. While not in line with the predicted relationship, this finding does suggest that there is a relationship within Turkey between the perceived adequacy of the Government's response to a natural

disaster and terrorism in the following month at the nation level. The average coefficient that was observed was 0.010.

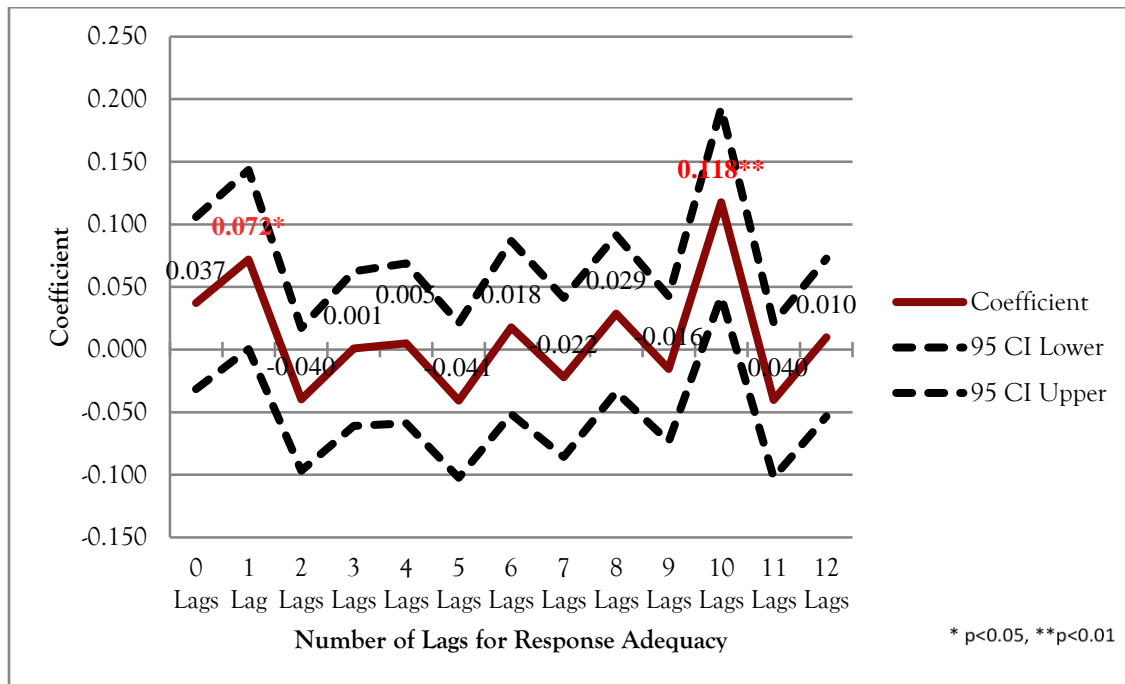


Figure 11: Coefficients for Adequacy of Government Response on Turkish Terrorism - 0-12 lags

As the above models treated all terrorist actions as being homogenous, this specification can be seen to not allow for variation in the relationship across terrorist organization types. As such, the following models differentiated between Kurdish terrorism and non-Kurdish terrorism in order to examine whether this relationship was different for ethno-nationalist terrorist organizations when compared to other terrorist organizations within Turkey. As with the above model, a positive and statistically significant relationship (had a two-tailed hypothesis been used) was observed at a lag of one month for Kurdish terrorism and negatively at 11 months (Figure 12). Although once again this finding for a lag of one month is the opposite of that predicted, this finding further suggests that there is an influence that the perceived adequacy of a government

response had on terrorism in the following month. Further, this finding can also be seen to further indicate that there is variability in this relationship over the course of a year. As the observed coefficients at all other points did not vary greatly in magnitude from zero (-0.024 – 0.055, $\bar{x} = 0.017$ for all lags), this observed relationship appears to be specific to a limited number of monthly lags for Kurdish terrorism.

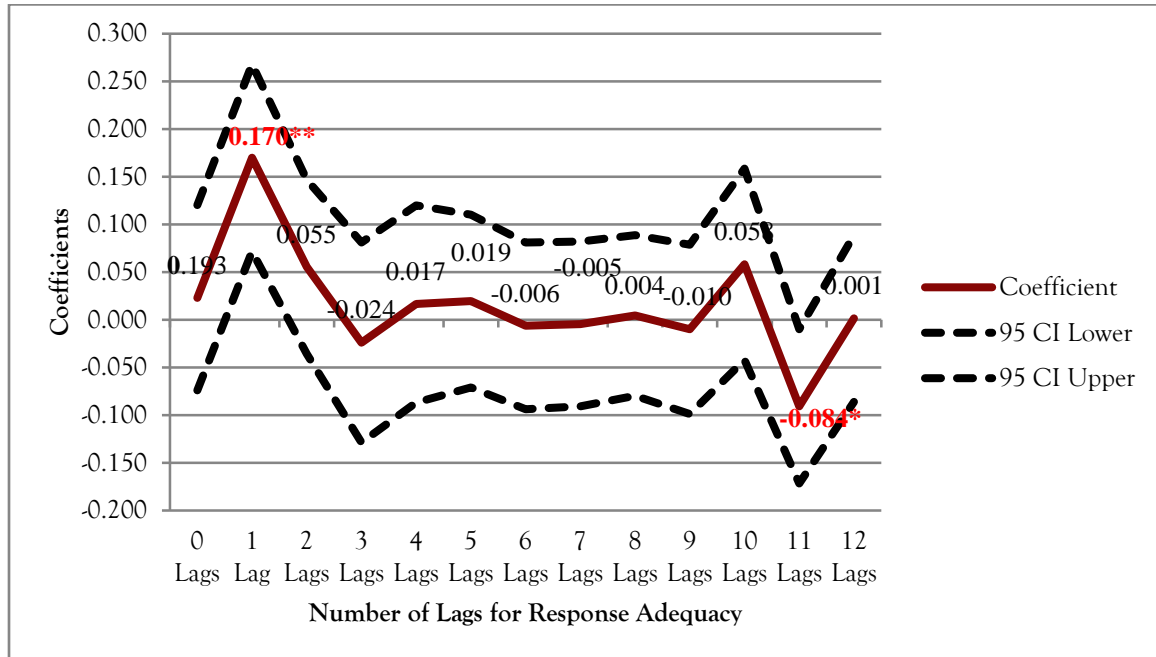


Figure 12: Coefficients for Adequacy of Government Response on Kurdish Terrorism - 0-12 lags

The relationship between the perceived adequacy of the Turkish government’s response upon non-Kurdish terrorism was observed to be more volatile compared to Kurdish terrorism across the 12 monthly lags between 1987 and 2011 (Figure 13). Despite this increased variation in the coefficients across the observed lags, the average coefficient was smaller in magnitude than any of the previously run models ($\bar{x} = 0.003$). Consistent with the initial model that investigated all Turkish terrorist events, a positive and statistically significant coefficient was observed for a lag of 10 months. In addition

however, a negative and statistically significant coefficient was yielded for both two and five months. While once again these findings deviate from the originally postulated hypothesis that non-Kurdish terrorism would be unrelated to the perceived adequacy of the government response, these findings further suggest that factors related to, but beyond, the presence of a natural disaster in Turkey impact both Kurdish and non-Kurdish terrorism within the Turkish nation. It further appears that these two models suggest that not only is there variation in the direction of the relationship between the perceived government adequacy and subsequent terrorism across types of terrorism in Turkey, but also that the length of time between these impacts also occur after varying periods following a natural disaster for Kurdish and non-Kurdish terrorism.

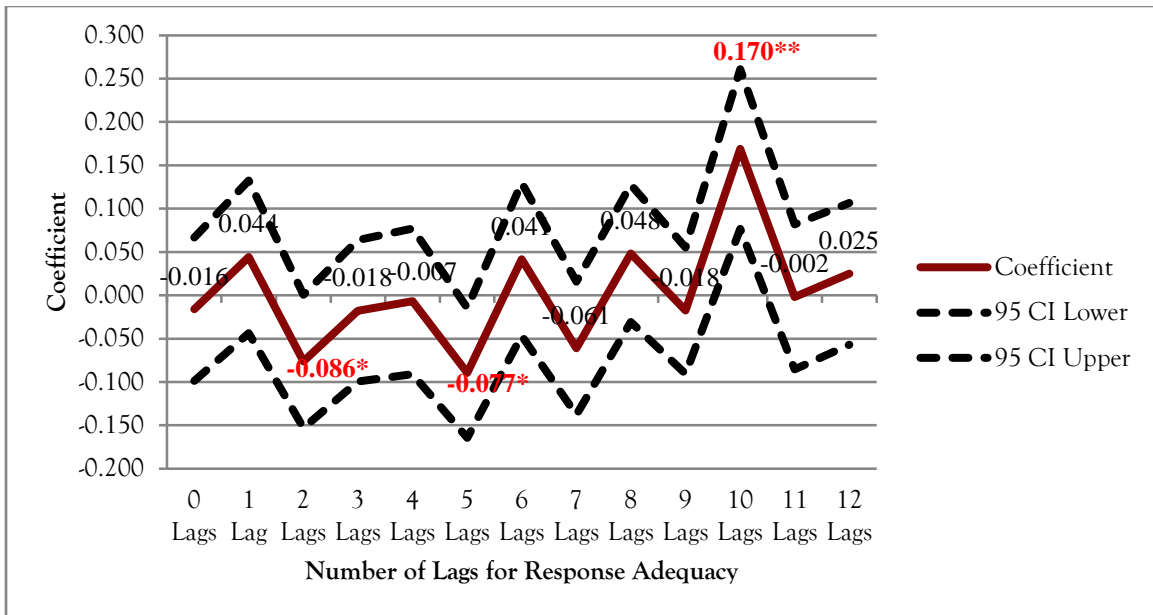


Figure 13: Coefficients for Adequacy of Government Response on Non-Kurdish Terrorism - 0-12 lags

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