What impacts the diffusion of violence in space? Recent research on the spread of violence suggests that it is contagious, but lacks a theory linking contagion to the strategic behavior of armed groups. By bridging between geographic studies on violence and theories analyzing the behavior of insurgent organizations, I challenge the notion assumed by contagion studies that violence is self-feeding. I argue that in order to better understand how violence diffuses, insurgents’ choice of targets must be taken into account. I develop a theory of insurgent targeting and explain how the interaction between insurgents and security forces informs the insurgents’ target choice. By using new disaggregated data on violence in the Indian state of Jammu and Kashmir, I show that the location of bases from which violence originates is crucial for explaining the spatial spread of insurgent violence.
Introduction

Does strategy have a role in the spatial diffusion of insurgent violence? Recent research on the spread of violence suggests that it is epidemic, but lacks a theory linking contagion to the strategic behavior of armed groups. If insurgent violence moves from one place to another in a way similar to the transmission of a disease, then what decisions inform this movement? By bridging between geographic studies on violence and theories analyzing the strategic behavior of armed groups, I argue that the spread of violence reflects a series of targeting decisions based on insurgents’ rational, cost-benefit calculations. By using new disaggregated data on violence in the Indian state of Jammu and Kashmir, I explain the strategic interaction between insurgents and security forces and show that a key explanatory factor for the spread of violence is the location of bases from which violence originates.

Research on violence has become increasingly disaggregated over the past decade. While initial theories on the onset of civil war employed highly aggregated data (Boix, 2003; Collier & Hoeffler, 2004; Fearon & Laitin, 2003), research on violence has steadily shifted to a micro-level analysis using disaggregated datasets (O’Loughlin & Witmer, 2011; Schutte & Weidmann, 2011; Townsley et al., 2008; Weidmann & Ward, 2010; Zhukov, 2012). The use of fine-grained data enables studying the dynamics of violence and exploring the process by which it is carried out. Current micro-level research on the diffusion of violence suggests that it is contagious: when one location is affected by violence, proximate locations will be affected as well. While these empirical findings reveal an interesting aspect of violence, they do not provide a coherent theory as to why this happens. By relying on the assumption that violence is self-feeding, these studies rule out the possibility that the spread of violence is determined by insurgent strategy. Including strategy in the analysis provides an alternative explanation for the spread of violence, as it
suggests that two proximate locations may experience violence simply because insurgents located in a nearby base have a strategic reason to target both.

In this paper, I argue that the spatial spread of insurgent violence is determined by insurgents’ targeting strategy. I explain the logic of target choice and demonstrate how the risk of retaliation by security forces informs insurgent decisions. I show that the specific location of violence is determined by the type of attack to be carried out, such that simple attacks are executed in locations that are close to insurgent bases and complex attacks are carried out in both proximate and further away locations. By incorporating strategy into a simple epidemic model, I show that taking into account the strategic calculations of insurgents is crucial to explaining the spread of violence in space.

This paper is organized as follows. I start by reviewing recent research on conflict and violence, which shows a shift to micro-level analysis. I then explain the different theories on the behavior and strategy of armed groups and studies on the geographical diffusion of violence. Combining strategic and geographic approaches, I propose a theory of insurgent targeting and explain the interaction of insurgents and security forces. I then provide a short background on the insurgency in Jammu and Kashmir, India, on which I base my empirical analysis, and explain my methodology for data collection and research design. After discussing my results, I conduct several robustness tests and conclude by suggesting avenues for future research.

**Review of the Literature**

Existing research on violence by armed groups is conducted at two levels of aggregation. On an aggregate level, theories on the onset of violence identify conditions that favor insurgencies and determine which countries are likely to experience insurgent violence in general. Fearon and Laitin argue that weak states are more prone to give rise to insurgencies,
since limited state capacity favors the activity of insurgent organizations (Fearon & Laitin, 2003). Cederman et al. postulate that exclusion from political power is an important predictor for violence onset (Cederman, Wimmer, & Min, 2010), and other studies point to economic factors such as high inequality (Boix, 2003), low GDP growth (Collier & Hoeffler, 2004) and natural resources (Ross, 1999). These studies provide a valuable understanding of general characteristics of regions that are prone to violence, but explain little as to the micro-level decisions of insurgents.

As a result, recently much research has been conducted into the specific disaggregate aspects of insurgency. These studies can be divided into two groups. First, studies on the behavior of armed groups focus on insurgent strategies, their interaction with state forces and the type of violence they use, as well as the process by which they recruit militants (Bueno de Mesquita, 2005; Kalyvas, 2006; Kydd & Walter, 2006; Laitin & Krueger, 2008; Lyall, 2009; Pape, 2003; Weinstein, 2005). The second branch of research focuses on the geography of insurgent violence, identifying factors that explain its diffusion in space and showing that it spreads in a contagious pattern over time (O’Loughlin & Witmer, 2011; Schutte & Weidmann, 2011; Townsley et al., 2008; Weidmann & Ward, 2010; Zhukov, 2012).

Studies on the strategy of terrorism explain the rational behavior of insurgents and general goals they seek to achieve with violence. Pape argues that the use of suicide attacks by armed groups is part of a “strategy of coercion” aimed at compelling democratic governments to make concessions in their favor. He shows that the rise in suicide terrorism in recent years is a result of its success in the eyes of armed groups, and explains how terrorist groups “benefit” from using a perpetrator that is willing to die (Pape, 2003). Similarly, Kydd and Walter propose five strategies of terrorist groups—attrition, intimidation, provocation, spoiling, and
outbidding—that correspond to various goals in fighting states and discuss the conditions that favor each strategy (Kydd & Walter, 2006). Bueno De Mesquita and Dickson suggest that the goal of radical insurgents is to increase popular support for their cause as opposed to that of moderate insurgents by using provocative violence that will cause the government to retaliate (Bueno de Mesquita & Dickson, 2007). Other studies suggest that insurgents seek to publicize their cause (Dershowitz, 2002, p. 94) and maintain organizational cohesion (Crenshaw, 1991).

Another group of research explains the dynamic interaction between insurgents and governments. In the international relations literature, scholars use game-theoretic models to explain the choices of governments and insurgents in different strategic settings. Arce and Sandler treat insurgent attacks as signals informing the government about the preferences of armed groups (Arce and Sandler, 2007). Jacobson and Kaplan suggest that governments will use targeted killings of insurgents when such killing would prevent attacks that will potentially cause a high number of civilian casualties (Jacobson and Kaplan, 2007). Finally, Bueno de Mesquita uses game theoretic interactions to show that offering concessions to insurgents can result in more violence by extremist militants (Bueno de Mesquita, 2005).

In the comparative politics literature, the interaction of insurgents and security forces is used to explain insurgent capacities and the type of violence they use. Lyall shows that indiscriminate violence by the government reduces, rather than increases, insurgent violence, as it exacerbates the collective action problem of insurgents in recruiting civilian support (Lyall, 2009). Kalyvas explains why in some cases insurgents limit their targets to individuals associated with the government and in other cases use violence indiscriminately. He argues that insurgents use selective violence in zones in which they control, and indiscriminate violence in areas where their control is limited (Kalyvas, 2006). Similarly, Balcells distinguishes between direct and
indirect violence during civil war. Direct violence is performed by insurgents using “light
weaponry” fighting in “face-to-face interactions,” and involves the collaboration of local
civilians, while indirect violence is carried out with “heavy weaponry” and does not entail
intimate interactions with victims (Balcells, 2011).

In addition to identifying the strategic goals of armed groups and the factors affecting
their interaction with governments, a third approach in the study of armed groups focuses on
insurgents’ recruitment strategies. Berman and Laitin explain that armed groups utilize intra-
group dynamics and promises of future material benefits to motivate individuals to carry out
suicide attacks (Berman & Laitin, 2008). Petersen explains that social networks and strong
communities are important for inducing individuals to join a rebellion (Petersen, 2002).
Weinstein suggests that armed groups benefit from “resource-poor environments”, as they enable
the recruitment of ideologically-motivated individuals that are not driven by material benefits
(Weinstein, 2005).

While studies on the behavior of armed groups provide insightful explanations for
insurgent strategies and capacities, many do not consider geographical factors that influence
insurgents’ choices. For example, Pape argues that suicide attackers are more likely to succeed
than conventional fighters in penetrating heavily guarded targets, but does not address the
problem of a suicide perpetrator backing out because of complexities in physically reaching a
target. Moreover, by defining targets as states or societies, Pape misses the tactical aspects of
specific locations of targets—i.e., villages, cities, or towns—that a geographical analysis of
violence can provide. Similarly, game-theoretic models of the strategic interactions between
insurgents and security forces do not include geographic factors that influence the payoffs of
both sides, thus failing to explain how insurgent strategies play out tactically. In order to model
the strategic behavior of insurgents, it is necessary to take into account the physical setting in which they operate.

Geographic studies on violence focus primarily on the physical reality of warfare. This stream of research approaches the study of violence from a different angle; instead of explaining the motivation of insurgents and their interactions with state governments, they focus on the geographical characteristics of conflict regions and explain the diffusion of violence in space. The main finding of geographic research on violence suggests that violence is “contagious”; that is, it expands spatially over time in a pattern similar to a contagion of a disease. These studies predict that when one location is affected by violence, proximate locations will be affected as well. Empirically, contagious patterns of diffusion were found in Bosnia, Kosovo, Burundi, and Rwanda (Schutte & Weidmann, 2011; Weidmann & Ward, 2010), as well as Chechnya, the North Caucasus (O’Loughlin & Witmer, 2011; Zhukov, 2012), and Iraq (Townsley et al., 2008). When studying the dynamics of violence in Bosnia, Weidmann and Ward found that populous and ethnically diverse areas were more likely to be affected by violence, as were locations proximate to the border with mountainous terrain (Weidmann & Ward, 2010). Similarly, a study on the North Caucasus determined that forested areas were more prone to experience violence, while locations removed from a major highway were less vulnerable (O’Loughlin & Witmer, 2011). Finally, the quality of roads was found to facilitate the spread of violence in the North Caucasus, since road networks enabled the movement of insurgents from one place to another (Zhukov, 2012).

The geography of violence adds an important aspect to the study of insurgency. However, most of these studies lack a theoretical explanation for how and why violence spreads, as they assume that violence is self-feeding—i.e. violence causes more violence. Making such
assumption undervalues the impact of agency on the spread of violence, and thus fails to provide a satisfying account for the behavior that constitutes this observed diffusion. For example, O’Loughlin and Witmer and Zhukov found that locations that are close to roads are more prone to be affected by violence (O’Loughlin & Witmer, 2011; Zhukov, 2012). While this finding is important, it does not explain how roads factor into the strategy of insurgents fighting a state. Zhukov argues that roads are important since they facilitate the movement of insurgents from one location to another, but does not provide an account for why insurgents would constantly move. An alternative explanation for the importance of roads is that insurgent cells are distributed across the conflicted region in different bases and carry out attacks in locations that are accessible by roads. In order to explain why roads are important, it is necessary to combine geographic analysis with a theory that explains the strategy of insurgents fighting a state.

In this study, I uniquely bridge between strategic and geographic approaches to violence. Using the foundations of the strategic approach, I develop a theory explaining how the choice of insurgents to carry out attacks in different locations affects the geographical spread of violence. I suggest that contagion is not the result of self-feeding violence, but depends on agency and the interaction of insurgents and the government. I also show that an analysis of insurgents’ strategic behavior is not complete without including geographic factors, and maintain that in order to model correctly how insurgents make strategic choices, both geography and strategy must be considered.

A Theory of Targeting

I will begin by defining the core concepts and terms essential to understanding insurgents’ decisions to target locations for attacks. An *insurgent organization* is a sub-national
armed group that uses violence, primarily against state actors and institutions, but also against civilians, in order to compel incumbent governments to comply with its demands (Kydd & Walter, 2006; Pape, 2003). Insurgent organizations are typically composed of networks spread across an area in which they operate (Sageman, 2008). Some insurgent groups have a more hierarchical structure, organized according to a chain of command similar to a military, in which regional commanders supervise area commanders who order insurgent cells to carry out attacks. In less hierarchical organizations, violence is carried out more sporadically, but there is some connection between insurgent cells (Hoffman, 2001). Insurgent organizations rely on local as well as external support to carry out violence. Locally, these organizations use the support of local populations to evade security forces, hide weapons, and recruit militants (Balcells, 2011, Fearon & Laitin, 2003; Weinstein, 2005). Externally, they gather material and financial support from diasporas (Kalyvas & Balcells, 2010).

An important aspect of insurgent organizations is that they originate violence out of bases. Insurgent bases are locations in which insurgents evade security forces, plan attacks, and store weapons. Unlike military bases, insurgent bases do not always consist of a contiguous geographic area under the exclusive control of armed forces. Rather, they are scattered among houses and other buildings that typically belong to civilians supporting insurgent activity (Jamwal, 2003). Insurgent bases are not only located in remote areas such as forests and mountainous regions, but are also present in more populous areas such as villages or towns (Fearon & Laitin, 2003; Jamwal, 2003). The interlinking connections between bases reflect the network structure of insurgent groups, where bases constitute the network nodes (Hoffman, 2001; Flint, 2003). When insurgent groups devise strategies to carry out violence, bases serve as the ultimate origin of attacks in both time and space.
Acts of insurgent violence have varying degrees of complexity. Militants with limited capabilities carry out basic attacks requiring little training, while militants with advanced training carry out more complicated attacks. Such sophisticated attacks often require advanced planning and logistical support, including weapons delivery and means of evading detection. In order to understand which targets are likely to be chosen by militants, it is necessary to distinguish between simple and complex attacks.

Simple attacks include acts of violence that require little or no planning, and can be carried out by militants with a low level of training. Examples of simple attacks include shooting on military personnel in areas close to insurgents, attacking civilians in nearby villages, and using primitive arms such as knives and stones. The process of executing simple attacks is different from complex attacks, because insurgents utilize their pre-existing knowledge of an area and do not engage in sophisticated planning. Moreover, since these attacks require little resources and training, they are carried out more frequently than complex attacks.

Complex attacks are carried out when insurgents have better capabilities. They take more time to plan and require sophisticated schemes to carry out. Complex attacks include detonations (including suicide bombings), infiltration of secured locations such as military bases, government buildings, and commercial areas, as well as attacks on public figures. From militants’ perspective, these attacks are considered to be of a higher quality, and the perpetrators receive greater honor when they succeed in carrying them out (Moghadam, 2003). However, since complex attacks target more sensitive targets, they attract more attention from security forces, which increases the likelihood of retaliation. In order to minimize the risk of retaliation by security forces, insurgents have an incentive to reach locations that are further away from their base when executing complex attacks.
Insurgents’ targeting strategy consists of cost-benefit calculations for carrying out different types of attacks. Complex attacks have a greater utility for insurgents, since they are more likely to challenge the authority of the government and raise awareness to insurgents’ cause. However, they are also more costly, forcing insurgents to limit their execution. Simple attacks are less costly, but their utility for insurgents is smaller. When planning attacks, insurgents take these factors into account; their choice of targets is what eventually constitutes the spatial pattern of violence.

In the analysis below, I assume that the utilities of executing simple and complex attacks are constant. This is a simplification, as some complex attacks may have more utility for insurgents than other complex attacks, and some simple attacks may be more beneficial than other simple attacks. However, since complex attacks are generally more valuable to insurgents than simple attacks, constant utility functions that capture this difference are useful. The costs of executing simple and complex attacks are not constant, and depend on three factors: (a) the distance that insurgents need to travel from their base to reach the target, (b) the training and materials needed for the execution of the attack, and (c) the probability of retaliation by security forces. When executing attacks, insurgents must first move from their base to the target. As the distance between these locations increases, so does the cost of the attack. Similarly, the cost of training militants to evade security forces and transporting materials to the target increases with distance. A large distance between a base and a target requires insurgents who are trained in escaping security forces’ surveillance and are capable of transporting armed and explosives to potential targets without being detected. Finally, different types of attacks have varying probabilities of retaliation by security forces. Attacks that challenge the authority of the government are more likely to lead to retaliation than attacks which do not.
The utility and cost functions are illustrated in the following graph:

**Figure I – Utility and Cost Functions of Simple and Complex Attacks**

![Graph showing utility and cost functions for simple and complex attacks](image)

The graph shows that the utility obtained by executing complex attacks is greater than simple attacks ($U_{\text{complex}} > U_{\text{simple}}$). The cost of executing attacks depends on the distance from a base ($b$), the risk of retaliation by security forces ($s$), and the training and materials needed for the attack ($m$). For simple attacks, the risk of retaliation is very small, since these attacks generally do not challenge government authority. Therefore, retaliation risk is omitted from the cost function of simple attacks, making it a linear function: $C_{\text{simple}} = b + m$. The cost of complex attacks is given by $C_{\text{complex}} = b + m + s$. This is a non-linear function, such that when $b$ is very small, the cost is high, since the risk of potential retaliation ($s$) by security forces is high. Although security forces may not always retaliate after complex attacks in the same location where the attack took place, the retaliation process generally starts in the area of the attack, when security forces attempt to capture escaping perpetrators. Therefore, even if security forces may retaliate in multiple locations after a complex attack, carrying out such an attack in a location proximate to a base increases the probability of being captured. The risk of potential retaliation diminishes as the
distance between the attack and the base increases. However, as the distance from a base continues to increase, the cost function for complex attacks increases again, since the cost imposed by $b$ and $m$ is larger than the reduced retaliation risk ($s$). For both types of attacks, insurgents’ optimal strategy is to attack in the areas where $U > C$. This can be seen in the shaded areas in the graph.

The implication of the strategy described above is that insurgents will choose to carry out simple attacks in locations that are close to their base and complex attacks in locations that are not too far and not too close to their base. Since the cost of simple attacks increases linearly with distance, it is not “worth it” for insurgents to carry out simple attacks in locations that are far from their base. For complex attacks, however, the situation is different. Carrying out complex attacks in locations close to a base poses a high risk of retaliation by security forces. Therefore, when possible, insurgents attempt to carry out complex attacks in further away locations.

Executing complex attacks in locations that are far from a base requires a medium to reach distant targets, such as road networks. Roads are important for carrying out complex attacks, since distant targets cannot be reached by walking. The importance of roads to the spread of violence has been previously discussed by O’Loughlin and Witmer (2011) and Zhukov (2012). However, unlike these studies, which assume the roads facilitate the move of violence from one location to another, I suggest that roads are important as they inform the choice of targets by insurgents planning complex attacks. As insurgents seek potential targets in distant locations, they choose locations that are accessible by roads.
Determinants of the Spread of Violence - Contagion vs. Insurgent Strategy

The spread of insurgent violence, therefore, can be explained by two general theories. Contagion studies suggest that violence moves from one location to another in a way similar to the transmission of a disease. Thus, once a location is affected by violence, proximate locations will be infected as well (O’Loughlin & Witmer, 2011; Schutte & Weidmann, 2011; Townsley et al., 2008; Weidmann & Ward, 2010; Zhukov, 2012). The targeting theory suggests that the clustering of violence in space corresponds to the choice of insurgents to attack locations that are close to their base. The reason for the apparent ‘movement’ of violence between proximate locations is that there is a base close to both. Proximity to bases is not the only factor influencing insurgents’ targeting strategy; proximity to roads is also an important factor for complex attacks. Since insurgents increase the risk of being arrested or killed by security forces if they only attack locations that are close to their base, they have an incentive to attack further away locations, making roads essential.

The predictions of the contagion and targeting theories can be translated into the following hypotheses:

**Targeting theory hypotheses:**

H$_1$: A shorter distance from a *base* will increase the likelihood of a location being targeted by militants executing *both simple and complex attacks*.

H$_2$: A shorter distance from a *road* will increase the likelihood of a location being targeted by militants executing *complex attacks*.

**Contagion hypothesis:**

H$_3$: Violence in location $i$ in time $t-1$ will increase the likelihood that a neighboring location $j$ would experience violence at time $t$ for either *simple* or *complex* attacks.
In addition to distance from bases and roads, there are other possible factors that may influence the choice of targets by insurgents. Places with higher population density are likely to be more “attractive” to insurgents (Raleigh & Hegre, 2009; Weidmann & Ward, 2010), since a greater number of victims can increase awareness to insurgents’ cause. Moreover, locations that are proximate to regions with mountainous terrain and forested areas are also more likely to be targeted, since rough terrain facilitates insurgent activity (Fearon & Laitin, 2003; O’Loughlin & Witmer, 2011; Weidmann & Ward, 2010). Finally, locations close to an international border may be more vulnerable to insurgent violence (O’Loughlin & Witmer, 2011), as such proximity allows armed groups to receive external military support.

In the next sections I examine the predictions of the contagion and targeting theories as to the conflict in the Indian state of Jammu and Kashmir. I start by describing the context of the conflict and the setting in which fighting took place, and then turn to an empirical econometric analysis.
The Conflict in Jammu and Kashmir

Testing the targeting theory on the insurgency in Jammu and Kashmir has several advantages. First, the conflict region is large enough to allow for variation in distances of potential targets from bases. Second, over the course of the conflict, multiple armed groups took part in fighting the Indian government, providing much information on insurgent attacks. Third, the duration of the conflict lasted over a decade, enabling testing the geographical spread of violence over time.

The insurgency in Jammu and Kashmir dates back to the late 1980s, but is rooted in the partition of British India in 1947. After the Indo-Pakistani war of 1947-9, Jammu and Kashmir was divided into Indian-administered Kashmir and Pakistan-administered Kashmir. The Indian part of Kashmir, consisting of a Muslim majority population, became one of the states of the Indian Union, and was initially granted much autonomy under Article 370 (ICG, 2003). Over time, Kashmir’s autonomy was eroded as the Indian government began pursuing more centralized policies. The hegemony of the central government over Kashmir was manifested in the elections of 1983, when it dismissed the popularly elected Jammu and Kashmir National Conference party. It continued in the elections of 1987, where it aligned with the National Conference and manipulated election results. The rigging of the 1987 elections led to mass protests in the state and increased popular mobilization to militant groups. As civil unrest increased, the Indian government responded with harsh measures, causing the conflict to escalate into a large-scale insurgency (Ganguly, 1996; Peer, 2010a, p. 13-15).

In the first few years of the conflict, there were few militant groups operating in the region, among which the most prominent were the Jammu and Kashmir Liberation Front (JKLF) and Hizbul Mujahideen (HM). Young men recruited to these organizations crossed the border to Pakistan-administered Kashmir to receive arms and training, and began participating in the
insurgency upon returning to Kashmir. As the conflict continued, more armed groups joined the fighting, and as a result, the locus of the conflict expanded out of Kashmir Valley into the southern parts of Kashmir, first to Doda and Udhampur districts, and later to Punch and Rajauri districts (Bose, 2003, p. 119, 125-7, 147). This expansion can be seen in the map below.

Kashmiri militants carried out attacks against Indian security forces and civilians almost on a daily basis during the 1990s (Chandra, 2010; Chandra & Zeira, 2010). Whereas in the beginning of the insurgency the armed groups operating in the region were composed of Kashmir-based secular militants, by the late 1990, the most dominant groups were Pakistani Islamic groups such as Lashkar-e-Toiba and Harkat-ul-Mujahideen that infiltrated into Kashmir from Pakistan (Staniland, 2012).

**Figure II – The Expansion of the Conflict in Jammu and Kashmir**

Violence in Kashmir intensified with the continuation of the conflict and the increased number of militants and armed forces. Militants relied on continued training and support of insurgents in the diaspora and Pakistani agents, and improved their capabilities as they fought India’s armed forces (Jamwal, 2003). New methods of conducting violence were introduced as
more armed groups joined the fighting. For example, Lashkar-e-Toiba introduced suicide attacks, which were incidents of violence in which militants recruited to suicide squads infiltrated highly secured locations and committed suicide using arms and explosives, attempting to kill as many people as possible (Bose, 2003, p. 141-2). Indian security forces intensified their counterinsurgency operations as well, carrying out daily raids to expose militant hideouts and initiated “encounters” in which they killed, injured, and arrested suspected militants and civilians (Chandra, 2010; Chandra & Zeira, 2010). Cycles of insurgency and counterinsurgency continued with varying levels of intensity until the mid-2000s, and subsided since then.

An important aspect of the conflict in Kashmir is the large number of insurgency groups involved. Throughout the conflict, about thirty groups were active in fighting, including split groups and groups that today are not active (SATP, 2012). While these groups varied in their organizational structures, all of them were based on networks spreading geographically (Staniland, 2012). Some groups were more hierarchical in nature, while others were less organized. For example, Hizbul Mujahideen had a relatively hierarchical structure, as it was organized in five divisions that spread across the Kashmir Valley and Jammu region (SATP, 2012). Each division had a regional commander that oversaw the activities of cells (Jamwal, 2003). The Jammu and Kashmir Liberation Front, on the other hand, was less organized and did not have the same hierarchical discipline as the Hizbul Mujahideen (Staniland, 2012).

The distribution of insurgent cells across Kashmir enabled militants to spread their violence geographically. The location of bases was crucial for militants, since these were the places from which they carried out violence (Indian Express, 2011; Praveen, 2005). The bases of insurgents in Kashmir were located both in forested and mountainous areas (Praveen, 2005; Rosenberg, 2005), as well as houses of civilians in villages and towns (Indian Express, 2010;
Bases were the locations in which insurgents evaded security forces, stored weapons, and planned attacks, and were placed in areas where insurgent had civilian support (Vinayak, 2006; Rosenberg, 2005; Praveen, 2005; Indian Express, 2011). As Figure IV shows, each base had multiple potential targets surrounding it, providing militants with a large range of target choices.

The period examined in this study, 1999-2001, is a subset of the total period of the conflict. During these years, multiple bases have already been established across Kashmir, and violence was highly intense. Bose (2003) describes this period as the “Fiddayeen Phase” of the conflict, as it was marked by the introduction of suicide missions by militants of Pakistani groups. From 1999 to 2002, there were at least fifty-five such suicide attacks targeting camps of security forces and government buildings (p. 140-1). The utilization of this method of fighting is important for the analysis of insurgent strategy, as it enables differentiating between complex and simple attacks.

From 1999 to 2001, violence by both militants and security forces was highly intense. As can be seen in Figure III below, the total battle-related deaths were the highest from 1999 to 2001. During this period, militants were well trained in perpetrating violence and were located in bases that spread across many parts of Kashmir. Similarly, security forces maintained a high presence in the region as well, and as Peer notes, Kashmir at that period was “the most militarized place in the world” (Peer, 2010b).

The spread of violence from 1999 to 2001 can be seen in the maps in Figure V. Since this is a subset of the total period of the conflict, these maps do not show the complete process of violence diffusion. However, it can be seen that during these years, violence spread in a pattern similar to a contagion of a disease. When an incident of violence was carried out in one location,
proximate locations were attacked as well. In the analysis in the next section I test the effect of
distance from bases and proximity to roads on the spread of insurgent violence in Kashmir, and
assess how these factors relate to the contagious pattern of violence.

Figure III: Total Number of Deaths, Jammu and Kashmir 1988-2010

Source: National Consortium for the Study of Terrorism and Responses to Terrorism (START). (2011)
Figure IV - Distance of Bases to Potential Targets, Jammu and Kashmir 1999-2001
Figure V - The Spread of Violence in Jammu and Kashmir, 1999-2001

January-June, 1999          July-December, 1999

January-June, 2000          July-December, 2000

January-June, 2001          July-December, 2001
Data and Methods

To test the effect of distance from bases and proximity to roads on the geographical spread of insurgent violence, I use new disaggregated data on violence in Jammu and Kashmir from the Constructivist Dataset on Ethnicity and Institutions (CDEI) (Chandra, 2010; Chandra & Zeira, 2010). My argument requires highly accurate data on the specific location of attacks, since without such information nothing could be inferred on the choice of targets by insurgents. The creation of disaggregated and geocoded databases on violence is a new development in political science. While such data are available for other regions in the world (Raleigh, Linke, Hegre, & Karlsen, 2010), currently there is no database except the CDEI that provides village-level information on violence in Jammu and Kashmir. Incidents of violence from the CDEI are geocoded according of a list of 6315 villages and towns from the Indian census of 2001. I obtained latitude and longitude data for every village and town from the University of Tokyo’s IndeaPlaceFinder (Sagara, 2011).

Dependent Variable – Simple and Complex Attacks

Utilizing the CDEI violence data, I generated a dichotomous variable for simple and complex attacks for every village and town containing acts of violence. Simple attacks included shootings, lobbing grenades, kidnappings of civilians, and the use of primitive arms such as stones and knives. Complex attacks included suicide attacks, explosions of landmines and improvised explosive devices, infiltration of secured locations, and attacks on public figures. Incidents that were missing information on location were excluded from the dataset, since without specific location identifiers no analysis could be conducted on the choice of targets by insurgents.
Independent Variables

Data on roads in Jammu and Kashmir was obtained from GeoCommunity, an online resource for GIS and geospatial data (GeoCommunity, 2010). Proximity of roads to every village and town was measured using the Near analysis tool of ArcGIS. For each village, this tool compares the surrounding road points and returns the point having the minimum geodesic distance from the village. The distance is given in decimal degrees, but I converted it into miles using the calculation tools of ArcGIS.

Data on bases were obtained from the CDEI. Locations in which Indian security forces carried out a raid to arrest militants, smash hideouts, and recover weapons were coded as insurgent bases. As complete information on locations of bases was not available, activity of security forces served as a proxy for locations of bases of militants. This is a possible limitation in the data, since only locations that were reported to have been raided by security forces were included. Since using security forces’ raids on bases and insurgent attacks from the same period can create a problem of endogeneity, I also created a lagged variable for bases, using data on bases from one year and data on violence from two consecutive years (see Table II in the Appendix). As with roads, the distance from bases was measured with the Near analysis tool of ArcGIS and then converted to miles.

The contagion variable measures the weight of violence in proximate villages, and is used to assess the probability of violence in villages that have not experienced violence in the past. When a village is attacked, it is considered ‘infected’, and consecutive attacks in this village are dropped from the dataset. The contagion variable was created using a spatially weighted matrix generated by Geoda. The matrix includes the ten closest villages for each village or town in Kashmir. To generate the variable, I use a simple contagion formula: \( \sum w_{j}x_{j,t-1} \), where \( w_{j} \) is the
inverse-distance weight for the ten villages closest to a given village, and \( x_{j,t-1} \) is whether these villages had violence at time \( t-1 \).

**Control Variables**

I obtained data on population from the Indian 2001 census. For mountainous regions, I used spatial data on elevation from *GeoCommunity*. I could not find village-level data on forested areas, so I used district-wise data on forests from the Jammu and Kashmir Forest Department (2003). Finally, using ArcGIS, I calculated distance from borders (both with Pakistan and China) using data on borders from the spatial database of New York University.

In order to compare the contagion hypothesis with the targeting hypotheses, I use a time series-cross section statistical model. Using a village-month unit of analysis, I compare 6315 villages and towns in Kashmir over the course of three years (1999-2001). The total number of observations is 217,545. The statistical model used is:

\[
\Pr(y_{i,t} = \text{violence}) = \logit^{-1}(b_t + r_t + \sum w_j x_{j,t-1} + z_{i,t})
\]

The model combines a contagion variable and targeting variables, thus allowing for a comparison of their relative effects. It measures the probability that a village \( i \) will experience violence at time \( t \) as a function of its proximity to bases (\( b \)) and roads (\( r \)) at time \( t \), controlling for the effect of contagion—i.e. violence in nearby villages at time \( t-1 \)—population, elevation, forested areas, and distance from borders.

To test the effect of distance from bases, roads, and contagion on the spread of violence, I use two separate sets of regressions. For each set, I run regressions using simple attacks, complex attacks, and violence as a whole as the dependent variable. Table I (see Appendix) includes data on insurgent violence from all three years (1999 to 2001), as well as data on bases from the same period. Table II shows the same regressions with lagged data on bases, in which information on
The reason for the second set of regressions is that data on bases is derived from security forces’ raids on militant bases. Although security forces’ raids are used to find location of bases that would have existed even without the raid, one might object that insurgent attacks are carried out in locations in which security forces previously conducted a raid. Using lagged data on bases—even though they omit much information on bases—addresses this objection.

Results

Comparing the regression results for simple and complex attacks in Table I shows several interesting points. First, the results show that distance from bases is highly significant for both simple and complex attacks, supporting $H_1$. As the distance of locations from bases decreases, the likelihood of an attack increases. Moreover, the relative effect of distance from bases is slightly more important for simple than for complex attacks, supporting the notion that cost-benefit calculations of insurgents lead them to carry out simple attacks in locations that are close to a base more than complex attacks.

Second, the results show that distance from roads has a significant negative effect on the likelihood of complex attacks, but not simple attacks, supporting $H_2$. The targeting theory suggests that while insurgents carry out simple attacks in locations proximate to their base, they have an incentive to carry out complex attacks in locations that are further away from a base. Since reaching farther locations requires roads, locations that are accessible to roads will more likely be chosen as targets for complex attacks.

Third, the results show that violence in Kashmir follows a contagious diffusion pattern. The likelihood of attacks in a given village and month was influenced by attacks in proximate
villages in a previous month. More precisely, when violence was carried out in at least one of the ten proximate villages to a given village in one month, the likelihood of violence in that village in the next month increased. To understand the effect of contagion on the spread of violence in Kashmir, model (3) in Table I is the most appropriate. This is because it includes both simple and complex attacks and measures the effect of contagion on violence as a whole. The results of the contagion variables in models (1) and (2) should be taken with caution, since they include only one attack type. The contagion variable for simple attacks includes only previous simple attacks, and the contagion variable for complex attacks includes only previous complex attacks. If we treat simple and complex attacks are two completely different types of violence that do not influence one another—alogous to two different types of diseases—then the contagion variable in models (1) and (2) can be assessed. However, I do not develop this point further in this paper, and therefore cannot infer much on the effect of contagion on simple and complex attacks measured separately.

Fourth, the effects of control variables support some of the findings of previous studies on violence contagion as well as the targeting theory. Population has a highly significant positive influence on the likelihood of both simple and complex attacks, supporting the notion of previous studies that populous areas are more likely to experience attacks. Interestingly, population seems to be somewhat more important for complex attacks than simple attacks, which can suggest that populous areas are more likely to be chosen for complex attacks. Elevation has a positive significant effect on both types of attacks, supporting the notion that insurgents operate in areas consisting rough terrain (Fearon & Laitin, 2003). Forest cover was not found to be significant for either type of attack. A possible reason for this result is that forest data was not measured at the village level, thus not capturing its influence on specific locations of violence.
Finally, distance from borders is significant only for simple attacks, showing that villages more proximate to the border are more likely to experience such attacks. This finding supports the targeting theory, which states that simple attacks will be carried out by militants with a low level of training. Locations that are close to the border with Pakistan are the first potential targets for militants returning from training across the border. If militants who return from training have only basic skills in carrying out attacks, distance from border would influence the likelihood of simple (but not complex) attacks, as the results show.

Table II shows the regression results using lagged data on bases. As can be seen, the results are very similar to those of Table I. Distance from bases still has a negative significant effect on the likelihood of both simple and complex attacks, and its effect on simple attacks is stronger than complex attacks. Proximity to roads is important for complex attacks, but not simple attacks, as expected by the targeting theory. The influence of contagion and population remains highly significant even with lagged bases, while the significance of the influence of elevation diminishes for complex attacks. The effect of forest cover becomes significant for simple attacks but not complex attacks, and the significance of distance from borders diminishes for simple attacks.

**Discussion**

The results of my study support the hypotheses of the targeting theory. The spread of violence is influenced by the location of insurgent bases and the existence of roads. While previous studies assume that violence is self-feeding, my findings suggest that agency is an important factor that should not be neglected. In order to understand better how violence spreads, it is insufficient to consider only its self-feeding effect. It is also necessary to include the choices
of the perpetrators of violence by looking at fighting from insurgents’ perspective. A short
distance from a base makes the execution of an attack easier and therefore less costly to
insurgents. Accessibility to roads is also important, but unlike previous studies which contend
that roads are essential for all types of violence (Zhukov, 2012), I show that roads are important
only for complex attacks.

In addition, the results show that contagion is important for explaining the spread of
violence. This raises an interesting question on the process of causality. Are the location of bases
and contagion two separate explanations? Or are they linked to each other in the same causal
process? I suggest that the latter is true. Since contagion is simply a correlation between
locations of violence in different points in time, there must be something else that influences the
location of previous violence. I argue that this factor is the location of bases from which violence
originates. Since insurgents are the perpetrators of violence incidents, their targeting decisions
determine the location of attacks at all points in time. Therefore, while the clustering of attacks in
space is an interesting and important phenomenon affecting the spread of violence, a more
fundamental cause of this clustering is the location of bases. My causal argument can be
described in the graph below:

Previous studies on contagion have focused on the link between the location of previous
attacks and current attacks. Examining the spread of violence from this perspective assumes that
violence causes itself. However, looking at violence only as a self-feeding phenomenon neglects deeper factors that can explain its spread. In this paper, I suggest that the location of bases is one such factor. When looking at the spread of violence from the point of view of insurgents, it becomes clear why the distance between bases and targets is important, as well as the accessibility of targets to roads. This perspective can also elucidate the reasons for the significant effect of population density, rough terrain, and distance from border on the spread of violence. These factors influence the cost-benefit calculations of insurgents, and therefore inform their decisions when choosing targets. The bases argument, therefore, does not invalidate the effect of contagion of the spread of violence. Instead, it shows that contagion itself is not enough. In order to provide a deeper explanation of the process of the spread of violence, insurgents’ decisions must be taken into account.

**Alternative Explanations and Robustness Tests**

There are several alternative arguments to the targeting theory that may account for the significance of bases on the spread of violence. First, one might argue that violence itself causes the establishment of bases. Thus, even though bases are the origin of attacks at time $t-1$ as well as time $t$, violence at $t-2$ can cause bases to be established, making bases just an intermediate link in the process of violence diffusion. While this argument is valid and is probably true in some cases, it still does not preclude the possibility that bases at time $t-3$ were the origin of violence at $t-2$, which causes the establishment of new bases at time $t-1$. Put differently, the presence of prior violence is compatible with the conclusion that violence is carried out by insurgents who are located in bases. Once we accept that insurgent groups are organized according to networks
(Sageman, 2008; Staniland, 2012), bases remain important for the execution of violence by insurgents.

Another argument may suggest that even though violence is carried out by insurgents moving from bases to targets, contagion can explain how violence by insurgents located in one base can motivate insurgents in another base to carry out violence as well. This argument proposes that when one insurgent cell carries out violence at time $t-1$, insurgent in a proximate cell will be motivated to carry out violence at time $t$. While this proposition may also be true, it does not rule out the importance of the location of bases. Even though different insurgent cells may influence each other, the location of their attacks still depends on the location of their bases.

A third objection may suggest that attacks are not always carried out by insurgents who move from bases to targets, but by insurgents moving from one target to another in series of attacks. This argument postulates that insurgents carrying out an attack at time $t-2$ will move from the location of that attack to carry out another attack at time $t-1$ and another attack at time $t$. Although there may be an unlimited number of ways in which insurgents will carry out attacks after they leave a base, I argue that the location of bases will still determine the general area in which these attacks will be carried out. Therefore, the location of bases is an important factor to understanding the spread of violence in space.

To confirm the validity of the influence of bases, I conduct several robustness tests. First, I run a regression with lagged data on bases in order to rule out the possibility that the location of attacks correlates with the location of bases merely because bases in my dataset are locations in which security forces carried out a raid. Since insurgents are fighting security forces, it is possible that the locations that they choose to attack are proximate to the locations in which security forces previously carried out a raid. As can be seen in Table II, however, the location of
bases is still important even when lagging the data on bases by one year. Moreover, even though the bases data in these regressions underestimate all insurgent bases, the results still show that the locations of bases are an important predictor for the spread of violence.

Second, in order to examine how the addition of different variables to the regression influences the effect of bases on the spread of violence, I run multiple regressions for simple and complex attacks, adding new variables consecutively. As can be seen in Table IV, the addition of variables does not change much the effect of bases, and has no effect on its statistical significance. Finally, I also run a set of time series-cross section Ordinary Least Squares regressions on the same data (see Table V), showing that even when changing the statistical model, the significance of location of bases remains robust.

Conclusion

In this paper I examined factors influencing the geographical spread of violence. By bridging between studies on the behavior of armed groups and studies on the contagion of violence, I showed that an important explanatory factor for violence diffusion is the location of bases from which violence originates. Using theories on the behavior of armed groups and geographical factors proposed by contagion studies, I developed a targeting theory explaining the process by which insurgents choose the targets of their attacks. My finding challenges the assumption of contagion studies that violence is self-feeding by showing that factors exogenous to violence itself—i.e., the targeting choices of insurgents—are important for predicting the location of violence. By establishing that the location of bases has a significant effect on violence diffusion, this study adds an important layer to geographical studies on violence. In addition, by introducing geographical factors to the study of the behavior of armed groups, this paper
provides a deeper account for the way in which armed groups operate. The combination of two streams of research makes this study a unique contribution to understanding violence by armed groups.

The targeting theory sheds light on the way in which armed groups operate within the boundaries of a state. It explains how insurgents choose targets for their attacks in a geographical region in which insurgency takes place. However, there are other forms of violence by armed groups that the targeting theory cannot explain. For example, it cannot account for international violence such as the 9/11 terrorist attacks in the United States, or even violence that crosses out of the conflicted region, such as the 2008 Mumbai attacks. These forms of violence can be considered a ‘special case’ of complex attacks, as they require extensive planning and preparation and their success generates great utility for insurgents. However, since these attacks are not carried out in locations in which an insurgency is taking place, they cannot be explained by the targeting theory. Several scholars have attempted to explain international forms of violence (Cronin, 2002; Laitin & Krueger, 2008); however, since these attacks are carried out sporadically in different locations around the world, there is little value in including them in an analysis of the diffusion of violence in a conflict region.

This study showed that distance from bases and proximity to roads are important factors explaining the spread of insurgent violence in Jammu and Kashmir. In order to generalize the targeting theory even further, future research should examine the influence of these factors on the spread of violence in other conflicts in the world. In addition, in order to make the conclusions of this study comprehensive, complete data on violence in Kashmir should analyzed. An analysis of the spread of violence in Kashmir that includes data from the entire conflict would make the conclusions of this study more robust, as it could show how the establishment of
bases over time led to the diffusion of violence throughout the entire conflict period. Until these empirical studies can be conducted, however, this paper shows that in order to explain the spatial spread of insurgent violence, targeting decisions by insurgents must be taken into account.

References


### Appendix

**Table I - Time Series-Cross Section Logistic Regressions (N = 217,545)**

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1) Simple</th>
<th>(2) Complex</th>
<th>(3) Violence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from bases</td>
<td>-0.2889*** (0.0362)</td>
<td>-0.2307*** (0.0552)</td>
<td>-0.2677*** (0.0303)</td>
</tr>
<tr>
<td>Distance from roads</td>
<td>-0.0114 (0.0254)</td>
<td>-0.0879** (0.0477)</td>
<td>-0.0295* (0.0225)</td>
</tr>
<tr>
<td>Contagion (10 closest villages)</td>
<td>0.3025* (0.2124)</td>
<td>0.7807*** (0.2792)</td>
<td>0.3575** (0.1804)</td>
</tr>
<tr>
<td>Log of population</td>
<td>0.6939*** (0.0466)</td>
<td>0.9091*** (0.0984)</td>
<td>0.7377*** (0.0401)</td>
</tr>
<tr>
<td>Log of elevation</td>
<td>0.7546*** (0.1136)</td>
<td>0.5680*** (0.1767)</td>
<td>0.6891*** (0.0960)</td>
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<tr>
<td>Forest cover</td>
<td>0.5875 (0.3853)</td>
<td>-0.0751 (0.6415)</td>
<td>0.4698* (0.3323)</td>
</tr>
<tr>
<td>Distance from border</td>
<td>-0.0056** (0.0029)</td>
<td>-0.0041 (0.0050)</td>
<td>-0.0052** (0.0025)</td>
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<tr>
<td>Constant</td>
<td>-15.7131 (0.8355)</td>
<td>-16.7805 (1.4963)</td>
<td>-15.2462 (0.7087)</td>
</tr>
</tbody>
</table>

Standard errors in parentheses  *** p<0.01, ** p<0.05, * p<0.1
<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1) Simple</th>
<th>(2) Complex</th>
<th>(3) Violence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from bases</td>
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<td>-0.0364**</td>
<td>-0.2524***</td>
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<tr>
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<td>(0.0186)</td>
<td>(0.0323)</td>
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<td>Distance from roads</td>
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<td>(0.0279)</td>
<td>(0.0555)</td>
<td>(0.0246)</td>
</tr>
<tr>
<td>Contagion (10 closest</td>
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<td>0.5577***</td>
<td>0.3286***</td>
</tr>
<tr>
<td>villages)</td>
<td>(0.1394)</td>
<td>(0.2241)</td>
<td>(0.1207)</td>
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<tr>
<td>Log of population</td>
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<td>1.0346***</td>
<td>0.8067***</td>
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<td>(0.0531)</td>
<td>(0.0839)</td>
<td>(0.0458)</td>
</tr>
<tr>
<td>Log of elevation</td>
<td>0.5974***</td>
<td>0.2258</td>
<td>0.5885***</td>
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<td>(0.1191)</td>
<td>(0.1876)</td>
<td>(0.1045)</td>
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<td>Forest cover</td>
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<td>0.6851*</td>
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<td>(0.4180)</td>
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<td>(0.3663)</td>
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<td>-0.0029</td>
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<td>(0.0030)</td>
<td>(0.0055)</td>
<td>(0.0027)</td>
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<td>(0.8100)</td>
<td>(1.406684)</td>
<td>(0.7677)</td>
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Standard errors in parentheses  *** p<0.01, ** p<0.05, * p<0.1
### Table III - Descriptive Statistics

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<tr>
<th>Variable</th>
<th>Description</th>
<th>Obs.</th>
<th>Mean</th>
<th>Std. Dev</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
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<td>Distance from bases</td>
<td>The distance in miles of villages and towns from insurgent bases. Data on bases obtained from the CDEI. Distance generated by Near analysis tool of ArcGIS.</td>
<td>217,545</td>
<td>3.857</td>
<td>8.135</td>
<td>0</td>
<td>172.486</td>
</tr>
<tr>
<td>Distance from roads</td>
<td>The distance in miles of villages and towns from roads. Data on roads obtained from GeoCommunity. Distance generated by Near analysis tool of ArcGIS.</td>
<td>217,545</td>
<td>2.485</td>
<td>2.257</td>
<td>0.000062</td>
<td>20.999</td>
</tr>
<tr>
<td>Contagion</td>
<td>An inverse-distance weighted sum of violence in the 10 proximate villages at time $t-1$. Data on violence obtained from the CDEI. Weighted matrix was created using Geoda.</td>
<td>217,545</td>
<td>0.022</td>
<td>0.149</td>
<td>0</td>
<td>2.930</td>
</tr>
<tr>
<td>Population</td>
<td>The total number of people in a village or town. Obtained from the Indian census of 2001.</td>
<td>217,545</td>
<td>1269.498</td>
<td>7840.441</td>
<td>2</td>
<td>1,811,962</td>
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<td>Log of population</td>
<td>A logarithm of the total population.</td>
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<td>6.562</td>
<td>1.107</td>
<td>0.693</td>
<td>14.410</td>
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<td>Elevation</td>
<td>A Digital Terrain Elevation Data (DTED) obtained from GeoCommunity.</td>
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<td>920.058</td>
<td>605.8</td>
<td>146.022</td>
<td>3694.052</td>
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<td>Log of elevation</td>
<td>A logarithm of the DTED.</td>
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<td>6.553</td>
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<td>4.984</td>
<td>8.214</td>
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<td>Forest cover</td>
<td>District-wise proportion of forest cover obtained from the Jammu and Kashmir Forest Department.</td>
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<tr>
<td>Distance from border</td>
<td>The distance in miles of villages and towns from the borders with Pakistan and China. Data on borders was obtained from the spatial database of New York University.</td>
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<td>25.029</td>
<td>19.346</td>
<td>0.0004</td>
<td>102.998</td>
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### Table IV - Time Series-Cross Section Logistic Regressions - Adding Variables

#### Dependent Variable – Simple Attacks \((N = 217,545)\)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
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<tr>
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<td>(0.0394)</td>
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<td>-0.0103</td>
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<tr>
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<td>(0.0250)</td>
<td>(0.0251)</td>
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<td>(0.0254)</td>
<td>(0.0254)</td>
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<td>Contagion (10 closest villages)</td>
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<td>0.4118***</td>
<td>0.3275*</td>
<td>0.3152*</td>
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<tr>
<td>(0.2118)</td>
<td>(0.2114)</td>
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<td>(0.2123)</td>
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</tr>
<tr>
<td>Log of population</td>
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<td>0.6939***</td>
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<td>(0.0466)</td>
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<td>Log of elevation</td>
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<td>(0.1136)</td>
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<td>Forest cover</td>
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<td>-0.0056**</td>
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<tr>
<td>(0.0029)</td>
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<td>(0.0876)</td>
<td>(0.3449)</td>
<td>(0.8247)</td>
<td>(0.8368)</td>
<td>(0.8355)</td>
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Standard errors in parentheses  *** p<0.01, ** p<0.05, * p<0.1

#### Dependent Variable – Complex Attacks \((N = 217,545)\)

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
<th>(7)</th>
</tr>
</thead>
<tbody>
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<td>Distance from bases</td>
<td>-0.4264***</td>
<td>-0.4081***</td>
<td>-0.3967***</td>
<td>-0.2773***</td>
<td>-0.2332***</td>
<td>-0.2329***</td>
<td>-0.2303***</td>
</tr>
<tr>
<td>(0.0627)</td>
<td>(0.0623)</td>
<td>(0.0623)</td>
<td>(0.0557)</td>
<td>(0.0542)</td>
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</tr>
<tr>
<td>Distance from roads</td>
<td>-0.1362***</td>
<td>-0.1339***</td>
<td>-0.0838**</td>
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<td>-0.0877**</td>
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</tr>
<tr>
<td>(0.0472)</td>
<td>(0.0473)</td>
<td>(0.0472)</td>
<td>(0.0477)</td>
<td>(0.0477)</td>
<td>(0.0476)</td>
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</tr>
<tr>
<td>Contagion (10 closest villages)</td>
<td>0.9451***</td>
<td>0.8647***</td>
<td>0.7912***</td>
<td>0.7908***</td>
<td>0.7799***</td>
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<tr>
<td>(0.2786)</td>
<td>(0.2765)</td>
<td>(0.2782)</td>
<td>(0.2785)</td>
<td></td>
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</tr>
<tr>
<td>Log of population</td>
<td>0.8598***</td>
<td>0.9032***</td>
<td>0.9033***</td>
<td>0.9036***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.0621)</td>
<td>(0.0671)</td>
<td>(0.0673)</td>
<td>(0.0672)</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Log of elevation</td>
<td>0.5158***</td>
<td>0.5143***</td>
<td>0.5705***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.1569)</td>
<td>(0.1627)</td>
<td>(0.1736)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Forest cover</td>
<td>0.0208</td>
<td>-0.0624</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.6200)</td>
<td>(0.6157)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Distance from border</td>
<td>-0.0041</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>(0.0049)</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>(0.1194)</td>
<td>(0.1435)</td>
<td>(0.1467)</td>
<td>(0.5272)</td>
<td>(1.3015)</td>
<td>(1.3037)</td>
<td>(1.3209)</td>
<td></td>
</tr>
</tbody>
</table>

Standard errors in parentheses  *** p<0.01, ** p<0.05, * p<0.1
### Table V – Time Series-Cross Section OLS Regressions ($N = 217,545$)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>(1) Simple attacks</th>
<th>(2) Complex attacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance from bases</td>
<td>-0.0001** (0.00008)</td>
<td>-0.00012** (0.00006)</td>
</tr>
<tr>
<td>Distance from roads</td>
<td>-0.0003 (0.0002)</td>
<td>-0.0003 (0.0002)</td>
</tr>
<tr>
<td>Contagion (10 closest villages)</td>
<td>0.0013** (0.0006)</td>
<td>0.0018*** (0.0004)</td>
</tr>
<tr>
<td>Log of population</td>
<td>0.0043*** (0.0005)</td>
<td>0.0032*** (0.0004)</td>
</tr>
<tr>
<td>Log of elevation</td>
<td>0.0027** (7.0009)</td>
<td>0.0009 (0.0007)</td>
</tr>
<tr>
<td>Forest cover</td>
<td>0.0071 (0.0044)</td>
<td>-0.0042 (0.0032)</td>
</tr>
<tr>
<td>Distance from border</td>
<td>-0.0001** (0.00001)</td>
<td>-0.00002 (0.00003)</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.0411 (0.0057)</td>
<td>-0.0211 (0.0041)</td>
</tr>
</tbody>
</table>

Standard errors in parentheses  *** p<0.01, ** p<0.05, * p<0.1