The Empire Strikes Back: Ethnicity, Terrain and Indiscriminate Violence in Counterinsurgencies

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Abstract

Objective. The literature on indiscriminate violence has emphasized how information shapes state capacity and determines whether and where the government employs collective targeting. This article investigates the conditions that influence the government's ability to obtain intelligence in counterinsurgencies. Specifically, it suggests that the government is more likely to use indiscriminate violence in areas characterized by indigenous ethnic homogeneity and forested terrain. These features increase the cost of acquiring information about the insurgents, and reduce state capacity, thereby increasing the likelihood of indiscriminate violence. *Method.* We examine district-level data on the Russian government's use of indiscriminate violence and disaggregated data on ethnicity and terrain across the North Caucasus from 2000 to 2011. *Results.* The results indicate that ethnically homogeneous and forested areas are significantly more likely targets of indiscriminate violence, and that the effect of ethnicity is markedly stronger when the district is densely forested. *Conclusion.* This finding expands on previous studies by testing the observable implications of theories linking information to indiscriminate violence, and by providing new micro-level evidence for important human and physical constraints on counterinsurgencies.

keyword indiscriminate violence, civil war, insurgency, counterinsurgency, North Caucasus, Russia

On December 29 and 30, 2013, unknown Islamic insurgents from the North Caucasus blew up a trolly-bus and the main train station in Volgograd, Russia, killing about three dozen people. The attacks were immediately linked to the Winter 2014 Olympic Games in Sochi (Souleimanov, 2014; Dzutsev, 2014), but were merely the most recent in a long-standing 'sons of the soil' conflict between the Kremlin and the North Caucasus, where the Russian army has used its entire repertoire of conventional arms to fight the insurgency for the past twenty years (Evangelista, 2002; Gammer, 2006; Souleimanov, 2007). Needless to say, the consequences for civilians caught in the cross-fire have been deadly (Cherkasov, 2001).

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The war has also been counterproductive, since it has hardened the divide between ethnic Russians and indigenous groups in the North Caucasus, and has expanded the scope of the problem, spreading violence from Chechnya to other republics throughout the North Caucasus: Dagestan, Ingushetia, Kabardino-Balkaria and elsewhere. Numerous international human rights organization have condemned Russia for its use of indiscriminate violence, including artillery and air strikes on populated places, as well as for the use of extrajudicial killings (Bjorken, 2000; HRW, 2006; ICG, 2014). The Russian government and its armed forces have repeatedly tried to subdue the insurgency, sometimes selectively targeting individual leaders, but often indiscriminately and without apparent regard for civilian causalities.[1] One of Russia's tactics in Chechnya was a standardized barrage pattern known as 'harassment and interdiction' (H&I) that consists of barrages at random intervals and of varying duration on random days without evidence of enemy movement (Lebedev, 1984, p. 373-75; Lyall, 2009, p. 343).

Although scholars and strategists generally agree that selective violence is more effective than indiscriminate violence—which forces non-combatants to flee into the arms of the rebels for security, engenders new grievances, and creates public outrage—governments across the globe continue to portray large swaths of civilians as insurgents and punish them without distinction. Given its serious drawbacks, which have been amply documented (Kalyvas, 2006, p. 146-72), why and where do governments nonetheless deliberately use indiscriminate violence in counterinsurgency warfare?

The literature provides us with several important insights, predictions and causal mechanisms. In one of the first rational choice treatments of this topic, Mason and Krane (1989) explain why low state capacity could drive the government's use of indiscriminate violence.[2] Kalyvas (2006) significantly expanded this line of research and generated new insights into how the scarcity of cooperative civilian informants and the degree (or zone) of control shape the type of violence.[3] Downes (2007) also extends this research agenda by providing a logic of desperation that explains why governments use indiscriminate violence in counterinsurgencies, and specifies the circumstances under which it can work to quell insurgencies.[4] In a recent study, Fjelde and Hultman (2013) provide evidence from Africa that informational shortages cause ethnic groups to target each other indiscriminately as collectives.

These explanations, as well as others discussed later, help us to understand why rational actors may use indiscriminate violence. In different ways and focusing on different actors, each of these accounts implies that low state (or armed actor) capacity—as manifest in the government's difficulty obtaining intelligence, distinguishing fighters from civilians, maintaining control and avoiding desperation—plays a key role in determining the use of indiscriminate violence. We build on these findings and seek to understand why civilian informants are more uncooperative, why information is more difficult to obtain and why control is more elusive in some places than in others. These issues highlight some of the key causal mechanisms and point to several observable implications.

For state capacity to be an explanation for the use of indiscriminate violence, however, it must be a variable rather than a constant across space and time, and not only between states but perhaps more importantly within them. Although a country may have a relatively high military capacity compared to another country (e.g., Russia versus El Salvador or Somalia), state capacity varies within countries as well, and is typically weakest near the periphery, where 'ethnic others' reside in large numbers (Cederman et al., 2009). Even within an insurgency-affected area in a peripheral region, the state's capacity is highly variable and this variation is likely to influence its counterinsurgency strategy and

specifically the probability of collectively targeting certain areas.

The literature provides good reasons to treat state capacity in counterinsurgency settings as variable within a state. A state's capacity is not independent of location. To project force effectively and with precision in a counterinsurgency operation, a state depends on intelligence about people and activities in that area, which often requires cooperative informants. As scholars of counterinsurgency have noted, the information civilians share with governmental forces is *the* indicator of how well the government is faring in its counterinsurgency campaign (Condra and Shapiro, 2012). A core task for counterinsurgents is obtaining reliable intelligence (Galula, 2006; Kitson, 1971; Thompson, 1966), since information scarce environments reduce state capacity by "blinding" governments and forcing them to resort to collective targeting and indiscriminate violence.

The flow of information from the civilian population to the government's forces in counterinsurgency campaigns is shaped by many factors. This article emphasizes two structural constraints on the flow of information that predispose certain areas to suffer more indiscriminate violence from the government's forces than other areas. Specifically, it suggests that ethnic homogeneity and forested terrain are likely to constrain the government's ability to obtain reliable intelligence through human and satellite methods, and this in turn makes these areas significantly more likely to suffer from indiscriminate violence.

The rest of the article develops this idea, and tests three observable implications using new micro-level data. The first section situates the argument within the literature on indiscriminate violence and counterinsurgency warfare. The second section develops a theory to explain spatial variation in the government's use of indiscriminate violence, and derives three testable hypotheses. The third section describes new district-level data on the Russian government's use of indiscriminate violence across the North Caucasus. The fourth section presents the methods and the empirical results. The last section summarizes the article's core findings regarding the structural sources of spatial variation in the government's use of indiscriminate violence. It concludes with a discussion of how these results may shed new light on why governments rationally use indiscriminate violence and collective targeting in counterinsurgencies, and particularly on where such violence is most likely to occur.

Theorizing Indiscriminate Violence

Existing studies of violence and irregular war indicate that carefully targeted violence against insurgents may be effective at quelling an insurgency, but that civilians turn to the rebels for protection once the government reverts to indiscriminate violence because political inertness no longer guarantees their safety (Mason and Krane, 1989). Kalyvas and Kocher (2007) also argue that civilians start to engage in rebel activities in the face of indiscriminate violence because it is safer for them to side with the insurgents than to remain neutral.[5] Azam (2006) suggests that indiscriminate violence lowers the reservation point and the marginal cost for joining the rebels. In short, indiscriminate violence is thought to help the rebels more than the government by tipping the balance against free riding and allowing rebels to more easily surmount the collective action problem. It provides civilians with a reason to join the rebels, both to ensure the safety (Mason and Krane, 1989; Goodwin, 2001) and to strike back and obtain 'justice' (Wood, 2003, p. 18-19, Kalyvas, 2006, 151-160, Souleimanov, 2007, p. 270-276). As Kalyvas and Kocher note (Kalyvas and Kocher, 2007, p. 183): 'individuals [may]

participate in rebellion not in spite of the risk but in order to better manage it.' The result is often an inefficient spiral of violence (Zürcher, 2007, p. 113).

Although governments may be cognizant of the potentially negative consequences of adopting such a strategy, increasing repression and indiscriminate violence may become the preferred strategy 'not because it has a high probability of success, but because the weakness of the state precludes its resorting to less violent alternatives' (Mason and Krane, 1989, p. 175). In other words, states resort to indiscriminate violence, the argument goes, not because they want but because they must (Zhukov, 2013).[6] Several scholars note that the use of indiscriminate violence is a sign of weakness and desperation (Downes, 2008; Hultman, 2007; Valentino et al., 2004). While state capacity explanations offer an important angle on this problem, they have been criticized for tautological reasoning and lacking clear causal mechanisms (Kocher, 2010). We agree that state capacity needs to be explained and correctly specified according to context. It would be difficult to call Russia a weak state, yet it has been unable to quell rebel violence in the Russian North Caucasus for more than two decades. An important reason, which is suggested in Zhukov (2013), is that coercion is difficult when information is unavailable and or costly to obtain. The central government in Russia realizes this problem, and has therefore opted to use local agents to maintain control in the North Caucasus, such as Ramzan Kadyrov in Chechnya. The region receives large financial support from the central government that allows the regional rulers to maintain political order in accordance with the wishes of the government in Moscow. However, this solution does not resolve the dilemma of instilling the desired order, because indirect rule is a double-edged sword that creates a principal-agent problem (Gerring et al., 2011; Gortzak and Siroky, 2012; Hechter, 2000; Salehyan et al., 2012). Moscow is rightly wary of devolving political power to its regional agents that it cannot fully control. Regional agents are often unable or unwilling to follow orders from the central government. This explains the widespread practice of dispatching large police forces from other regions of Russia to the North Caucasian republics. Local police forces are deemed too unreliable to be trusted with certain responsibilities, even though they are generously paid by the government in Moscow.

Applied to our theory, more (non-Russian) ethnic homogeneity implies more solidarity, all else equal, and this increase the cost of intelligence to the government, even when the center can delegate some of its informational collection efforts to locals. Lyall and Wilson (2009) also show that the mechanization of modern militaries inhibits information collection among local populations and results in increased difficulties for the government to separate insurgents from noncombatants and selectively apply rewards and punishment. Condra and Shapiro (2012) also make arguments that support this approach, and suggest that the information civilians share with government forces is *the* indicator of how well the government is faring in its counterinsurgency campaign. This paper emphasizes two factors–one human (ethnic homogeneity) and one physical (forested terrain)–which are highly variable across space within the same conflict, and jointly influence the availability of information that permits the government to adopt more selective counterinsurgency strategies.

To explain why and how the availability of this information is shaped by local human and physical structures, we first discuss the role of ethnicity and then the role of forested terrain, and finally how they interact to influence the likelihood of an area being indiscriminately targeted.

From Ethnicity to Information and Indiscriminate Violence

It is well known that organized state violence can harden group identities and shape behavior (Balcells, 2012; Simmel, 1955). Thus, while ethnic solidarity might antedate the conflict, it can also be constructed out of the conflict, creating an endogeneity issue. However, some degree of ethnic concentration appears to be necessary for resolving the initial collective action problem, and relatively spatially concentrated, ethnically homogeneous areas have a clear comparative advantage in this regard (Toft, 2010; Weidmann, 2009). The current conflict in Eastern Ukraine, for instance, is likely to harden the ethnic identities of Ukrainians and Russians, but it is not by accident that the conflict started in those areas where ethnic Russians were concentrated (e.g., the Donetsk and Luhansk regions). In the Caucasus, where many ethnic groups hold a grudge against the central Russian state, the conflict also took hold initially in Chechnya, where there was the largest and most spatially concentrated indigenous ethnic group in the North Caucasus (among those groups with grievances).[7]

Prior research indicates that group solidarity tends to be higher where administrative and ethnic boundaries are coterminous–i.e., when a local administrative unit is ethnically homogeneous (Homans, 1950; McPherson and Smith-Lovin, 1987; Hechter, 1988, 2000; Roeder, 2007; Siroky and Cuffe, 2015).[8] Locally homogeneous populations can foster higher levels of group solidarity because they can more efficiently monitor in-group members than ethnically divided districts, and thus punishment for treasonous behavior can be meted out with more precision (Hechter, 1988). In-group solidarity regulates and stems the flow of information from the insurgents to the government. When the central government finds it difficult to flip locals and recruit reliable informants, it is more likely to become desperate and to adopt a counterinsurgency strategy with diminished precision. These dynamics are self-reinforcing, since unintentional civilian casualties tend to further reduce cooperation from civilians (Thier and Ranjbar, 2009; Condra and Shapiro, 2012). Ethnic structures are therefore crucial in counterinsurgencies because highly solidaristic groups are difficult to penetrate, which makes intelligence hard to obtain and reduces the state's capacity to target insurgents more selectively.

Local ethno-demographic structures condition how easily the government will be able to find reliable civilian informants willing to risk punishment (usually death) at the hands of members of their own group for defection and collaboration (Kalyvas, 2008; Staniland, 2012). As a result, governments are likely to possess fewer options for extracting reliable and accurate information in ethnically homogeneous areas. The lack of reliable and accurate information diminishes the state's capacity and makes governments desperate, which increases the likelihood of electing to deliberately target civilians. State capacity is thus not a constant, even within the same country and time period, but is endogenous to local ethnic solidarity, which influences the extent to which information is leaked or quarantined. Where information is contained, the government possesses lower state capacity and is more likely to use indiscriminate violence against civilians.

Ethnic homogeneity provides the insurgents with key advantages that help it to overcome problems of information leakage and collaboration. Areas with greater ethnic diversity lack the same strength of monitoring, punishment and reciprocity mechanisms (Fehr et al., 1997; Gintis, 2000; Collier, 2001; Habyarimana et al., 2007). Although there is a large body of literature on how, and if so how much, ethnic heterogeneity is associated with a greater likelihood of civil war at the cross-national level (Sambanis, 2006), the sub-national level (Cunningham and Weidmann, 2010), and with more intense ethnic wars (Lacina, 2006), the link between ethnic structure and the use of indiscriminate violence

has received relatively little attention.[9]

Ethnicity need not be conceptualized in primordial terms, and multiple identities may exist, which may be more or less fluid, in this theory. Indeed, ethnic defection is still possible because ethnic solidarity is variable. Nonetheless, regardless of how fluid and myriad identities may be at a conceptual level, ethnic defection and information extraction should prove more difficult in areas dominated by one ethnic group with a high level of group solidarity. Moreover, since a decrease in economic development often precedes and accompanies counterinsurgency campaigns, the local population is often forced to increase its reliance on ethnic and clan structures for the provision of their needs in order to access public goods and services.[10]

Since the availability of information and access to cooperative informants in ethnically homogeneous areas depends almost by definition on the government's ability to seize upon potential ethnic defectors, the government must be willing and able to provide incentives to the defectors willing to engage in violence against their own ethnic kin (Kalyvas, 2008; Staniland, 2012).[11] Whereas Kalyvas focuses on the supply side of ethnic defection, Staniland emphasizes the demand side. This article builds on both these logics, and also highlights the conditions under which it is less or more likely. An important qualification to the demand side of ethnic defection is that switching to the government's side may be just as precarious as remaining in the insurgency. Consider the current ruler of Chechnya, Ramzan Kadyrov. Along with his father Ahmad Kadyrov, he defected to the government's side in the second Russian-Chechen war. In the first Russian-Chechen war, 1994-1996, both father and son fought the Russians. Soon after coming to power, Ramzan Kadyrov started to systematically eliminate high profile competitors to his patronage from the Kremlin. For example, Ruslan and Sulim Yamadaev, both "Heroes of Russia", switched sides from the rebel forces to pro-Russian forces but were killed, most likely on Kadyrov's orders. Ruslan Yamadaev was gunned down in Moscow[12] and Sulim Yamadaev was assassinated in Dubai (UAE).[13]

On the supply side, the government's willingness to accommodate the insurgents is constrained by principal-agent problems that arise when the government rules indirectly through native leaders (Hechter, 2000; Gerring et al., 2011). The central government succeeds in splitting the insurgency by co-opting some of the insurgents and elevating a few of them to positions of power. The flip side of this shrewd move is the government's loss of control, which can potentially undermine the entire effort to regain control over the region. This is precisely what has happened in Chechnya. The Russian government has avoided replicating the Chechen model of indirect rule elsewhere in the North Caucasus where the insurgency has spread, and for good reasons, even though there is evidence of demand for more self-rule (Siroky et al., 2013). The government may be willing to pay the price of using indiscriminate violence, instead of providing overly generous incentives for ethnic defection, when the affected area is ethnically homogenous and principal-agent problems, especially moral hazard, are likely to be severe.[14]

In focusing on the role of ethnicity, we are not arguing that ethnicity *per se* explains violence and we recognize that many political, social and economic factors influence the likelihood that the government will use indiscriminate violence. All else equal, local ethnic structures have a strong influence on the flow of information from local insurgency cells to the government because, in ethnically homogenous areas, intra-group dependence is generally high, free riding options are limited, and cooperative informants are few. This scarcity of information shapes state capacity at the local level, and in this way probabilistically

influences the government's counterinsurgency strategy. If this argument is correct, the observable empirical implication should be a concentration of indiscriminate violence in ethnically homogeneous districts.

If this is what the evidence reveals, this result would be consistent with the results in Cunningham and Weidmann (2010), which finds that conflict between an ethnic group and the state is more likely in locations that contain one demographically dominant ethnic group. A key mechanism for this is highlighted in Hechter (1988), which argues that groups are created to produce club goods and persist through their ability to engage in effective monitoring and sanctioning that are facilitated by dependence on the group. Monitoring and sanctioning are easier to implement in ethnically homogeneous communities, where group solidarity is generally higher and recruitment is easier (Gintis, 2000; Collier, 2001; Varughese and Ostrom, 2001; Habyarimana et al., 2007). When the government reverts to indiscriminate actions, personal safety becomes one of the most valuable goods that groups can produce. The production of this good enhances group solidarity and increases barriers to entry and external penetration. A central component of the barrier is informational. Ethnic homogeneity makes it more difficult for the government to obtain reliable information, which pushes the government to engage in more indiscriminate actions and results in a concentration of indiscriminate violence in ethnically homogeneous districts. Mixed populations make it easier for the government to extract intelligence by exploiting ethnic rivalries, and reduce the insurgency's ability to quarantine information and maintain a cohesive resistance.

From Terrain to Information and Indiscriminate Violence

The second micro-level factor emphasized in this paper that shapes the government's strategy is the physical terrain. Collier (2000), Fearon and Laitin (2003) and Kalyvas et al. (2008) all point to the role of difficult to traverse terrain on civil war and armed rebellion. Counterinsurgency theorists have long recognized that environmental structures influence the dynamics of conflict in crucial ways (Galula, 2006). "Guerrilla fighting," wrote Che Guevara, "will not always take place in the country most favorable to the employment of its tactics; but when it does, that is, when the guerrilla band is located in zones difficult to reach, either because of dense forests, steep mountains, impassable deserts or marshes, the general tactics, based on the fundamental postulates of guerrilla warfare, must always be the same."[15] Laqueur (1975) even argues that guerrilla warfare is defined by the use of difficult to traverse terrain. Both Buhaug and Gates (2002) and Fearon and Laitin (1999, 2003) find evidence that countries with more mountainous terrain were more likely to experience civil wars. Since rebel forces are normally in a weaker position than the government, they need to find ways to tip the balance of forces in their favor, and to survive they need places to hide. Difficult terrain provides such opportunities by offering refuge for insurgents and preventing the government from putting their superior forces to more effective use (Glaser and Kaufmann, 1998; Esteban et al., 2012; Carter and Veale, 2013).

Most of the literature identifies rough terrain as conferring tactical advantages and refuge or safe havens to the rebels. In addition, Hendrix (2011) argues, difficult terrain deprives the state of the ability to build an effective tax system and thereby decreases the state's fiscal capacity. Benson and Kugler (1998) finds that 'relative extractive capacity' is negatively associated with the severity of conflict–that is, countries are less likely to experience intense civil wars when they are able to better access the

resources of the societies they govern. Just as rough terrain and remote territory reduces the ability of the state to generate revenue by increasing the costs associated with collection, which generates lower fiscal contracts, this diminished revenue weakens the state's ability to contain and address other problems in its periphery, especially insurgency.

Hendrix (2011) posits that there is an indirect effect of mountainous terrain on tax capacity and a direct effect of mountainous terrain and tax capacity on civil war onset. The effect of geography on conflict is thus mediated by state capacity. This is consistent with Thies (2010), which finds that several measures of state extractive capacity are statistically unrelated to civil war onset using a simultaneous equations model. When focusing on the government's use of indiscriminate violence within an existing civil war (rather than on civil war onset), we expect that difficult terrain should make it less likely that the government employs selective targeting. While terrain has numerous effects, and it certainly confers tactical advantages to the rebels, the primary mechanism emphasized in this article concerns how terrain–particularly forested terrain–undermines the state's capacity to conduct surveillance and gather intelligence. Satellite and other digital intelligence are harder to exploit in forested areas, which also typically lack of important infrastructure, such as roads that are useful for surveying and controlling the insurgents. Moreover, when satellite intelligence and other distance-monitoring mechanisms are made more difficult, the government must rely more on human intelligence.

However, human intelligence is more costly to obtain in areas characterized by ethnically homogeneity of the out-group, which brings us to the central argument in this paper–namely, that terrain and ethnic homogeneity are mutually reinforcing because both make it more costly for the central government (for human and physical reasons) to collect taxes, extract intelligence and identify insurgents for selective targeting. The first two hypothesis examine the unconditional effects of terrain and ethnic homogeneity, whereas the third (and primary) conjecture concerns how the effect of ethnic homogeneity on indiscriminate violence is enhanced by the presence of forested terrain.

Deriving Testable Hypotheses

Given the difficulty that ethnic homogeneity can pose to the ability of a government fighting a counterinsurgency to find cooperative informants and acquire reliable intelligence, it is hardly surprising that diluting pockets of ethnic homogeneity is a strategy that governments have routinely pursued throughout history and around the world in the periphery–from Xinjiang and Javakheti to Ireland. Indeed, this form of divide and rule by mixing populations has been around since the time of Nebuchadnezzar, if not earlier, and was a key component in the formation of early modern Europe (Bartlett, 1994). More recently, Zhukov (2014) explored mass forcible resettlements in the Soviet Union, and emphasized the role of imperfect information in the government's decision to use mass resettlement as a policy tool. In examining the problem of collective targeting and indiscriminate violence, we build on these arguments by positing that where there is a greater degree of ethnic homogeneity (and thus a scarcity of actionable intelligence), the government is more likely to use indiscriminate violence, including such drastic measures as mass population transfers and indiscriminate shelling. This leads to the first hypothesis.[16]

Hypothesis 1: Ethnically homogeneous districts are more likely to be subject to a greater amount of indiscriminate governmental violence.

The second micro-level factor we theorize is terrain–specifically, the role that forested terrain plays in shaping the government's counterinsurgency strategy. While certain kinds of terrain are thought to make insurgency more likely in the first place by confering tactical advantages to the rebels (Fearon and Laitin, 2003; Esteban et al., 2012),[17] the hypothesized mechanism here is that forested terrain shapes the cost of surveillance and limits the utility of non-human (e.g. satellite) intelligence gathering. Like ethnic homogeneity, forested prevents the government from obtaining reliable and accurate information at a reasonable cost, which makes it harder to use precision measures. This leads to the second hypothesis.

Hypothesis 2: Districts with more forested terrain are likely to be subject to more indiscriminate governmental violence.

An alternative explanation for the relationship between forested terrain and indiscriminate governmental violence is that using artillery shelling and air raids would cause many casualties and would destroy a lot of buildings in cities, but not in a forest. If the state does not expect that civilians and their property are located near the target, it has less incentive to avoid using indiscriminate violence. This explanation omits two crucial considerations, however. First, the government's need to use artillery and other means of indiscriminate violence already signifies the state's failure to quell the insurgency through alternative means. Second, the state's reliance on highly visible means of destruction indicates its lack of local control.

When both human and physical means of intelligence gathering are constrained, the government will be forced to resort to indiscriminate tactics. The third and final hypothesis therefore posits an interactive effect between ethnic homogeneity and forested terrain.

Hypothesis 3: The effect of ethnic homogeneity on indiscriminate violence is enhanced by the presence of densely forested terrain.

In the next section, we describe disaggregated district-level data on all the factors implied by these hypotheses and covering the Russian counterinsurgency across the North Caucasus from 2000-2011.

Data Description

While it is widely known that the central government in Moscow fought two Russian-Chechen wars in 1994-1996 and 1999-2000, a protracted low scale insurgency has continued to spread across the North Caucasus region. In 2010-2012, an average of about 700 people have died in insurgency-related attacks in the North Caucasus every year. The vast majority of attacks have taken place in four autonomous republics in the North Caucasus–Dagestan, Chechnya, Ingushetia and Kabardino-Balkaria–but other nearby territories have also been hit occasionally.[18] Within these regions, there are many ethnic groups, some spatially concentrated into homogeneous enclaves and others spatially dispersed, and there is a wide variety of terrain as well, ranging from densely forested villages to open plains. This presents us with an excellent opportunity to explore the three hypothesized relationships.[19]

The dependent variable is operationalized as the count of violent indiscriminate acts in a given district, pooled over the period 2000 and 2011. Municipal districts include rural districts, cities and combinations of cities with adjacent rural areas. An indiscriminate act includes any incident involving artillery shelling, air raids, or the use of armored vehicles, and taken by the Russian Army, the FSB (Russian Federal Security Service), Special Forces, Police Forces, the Federal Administration, the Local Administration, and Ramzan Kadyrov.[20] Since our primary hypotheses are structural and spatial rather than temporal, we pool all the observations over time by district. The dataset builds on a unique data collection effort that uses a dictionary-based automated event coding to identify news reports about armed attacks, involving rebels and government forces (Zhukov, 2012). We expanded these data to include new district-level data to test the main hypotheses.

Figure I depicts the spatial distribution of indiscriminate government violence, the proportion of the largest indigenous ethnic group and the proportion of forested area across the North Caucasus in the region's 200 districts.[21]

[Figure I about here.]

To examine the role that ethnic structure may play in determining where the government is more likely to use indiscriminate violence, we collected data from the Russian census on the ethnic composition of each district.[22] We then calculated several formulas intended to capture the ethnic structure of a location. The simplest one, which we ultimately adopt in our analysis as the most straightforward indicator of our theoretical prediction, is the proportion of the largest indigenous ethnic group. To test the effect of forested terrain, we measured the proportion of the village(s) with forested terrain (Zhukov, 2013). We also included several controls, including measures for the proportion of villages in a district located on petroleum reserves, the average population size of a district taken from two censuses in 2002 and 2010, the average elevation of villages and towns above sea level in each district, and the district's urbanization.[23]

Empirical Analysis and Discussion

To examine the hypothesized relationships, we estimated a series of negative binomial regression models (Table I). Consistent with the first hypothesis, we find that as the proportion of the largest indigenous ethnic group increases, the expected count of actions involving indiscriminate violence also increases. The results indicate consistently high levels of statistical significance across all model specifications.[24] Hypothesis 2 receives weaker empirical support, but the results do suggest that the government is more likely to use indiscriminate violence in densely forested districts. This effect is hypothesized to be important mainly in the presence of ethnic homogeneity, according to Hypothesis 3, and we find strong evidence for an interactive effect between forested terrain and ethnic homogeneity. This is consistent with the third hypothesis, and suggest that districts that are both ethnically homogeneous and densely forested - which implies that both human and physical constraints on intelligence gathering are operating - are the most likely targets of indiscriminate violence.

Elevation is positively related to the government's use of indiscriminate violence in Model 2, but it becomes less significant in other models. Why is high elevation less robust of a predictor of indiscriminate governmental violence than forested terrain? One potential explanation is that since this variable

simply measures the elevation of the district above the sea level, it may not capture the idea of difficult to traverse terrain, since the government forces may still be able to easily access and control districts with high elevation. Another reason is that there are simply fewer people living in higher elevation districts than in forested area districts. This essentially means that difficult to traverse terrain does not attract indiscriminate violence by itself, unless there is a substantial supply of people there willing to rebel. The difference between forested and mountainous terrains in the North Caucasus also points to a possibility that these two factors may play different roles in different geographical locations, depending on the pattern of population distributions.

The constitutive terms that are used to construct the interaction term (in this case, the ratio of the largest ethnic group and the ratio of forested area) provide an estimate of the effect of ethnic homogeneity and forest terrain on the dependent variable, if the other constitutive term is held at zero (Brambor et al., 2006). What we notice is that when the variable 'Forest' is held at zero, the variable 'Ethnicity' is still positive and statistically significant. When 'Ethnicity' is held at zero, however, 'Forest' is no longer statistically significant. This makes sense, since districts where the proportion of forested area is high, but the proportion of indigenous ethnic group is close to zero, are mainly ethnic Russian villages and districts. Ethnic Russians in the North Caucasus are not engaged in an armed conflict with the central government in Moscow, so districts with high values for forested terrain and low values for indigenous ethnic homogeneity are far less likely to attract the government's indiscriminate violence. In sum, the evidence strongly indicates that districts with high levels of indigenous homogeneity and forested terrain are several times more likely to be targets of indiscriminate violence.

[Table I about here.]

In order to explore these effects graphically, we constructed 2-d marginal effect plots and 3-d wireframe and contour plots. Figure II shows the marginal effect of the proportion of the largest indigenous ethnic group on indiscriminate government violence (top panel). The effect of ethnicity starts to have an impact approximately at the moment when it crosses 20% of the total population. The slope of the marginal effect plot shows that the expected count of government indiscriminate actions doubles approximately every 25% in the proportion of ethnic homogeneity in the district. The bottom panel of Figure II shows the marginal effect of the proportion of the forested terrain in a given district. The effect of forest begins at the low value of 5%, which already increases the expected count of indiscriminate acts roughly 2.5 times. The slope of ethnicity is steeper than the slope of forested terrain (e.g., the proportion of forested terrain would need to increase by 40% in order to double the count of indiscriminate actions).

[Figure II about here.]

Figure III provide a 3-d representation of the interaction between indigenous ethnic homogeneity and forested terrain using a wireframe plot. It displays the marginal effect of ethnicity and terrain on the two horizontal axes and the interaction effect as a three-dimensional surface on the vertical axis. Figure IV shows the effect of each of these factors for fixed values of the other, e.g., the effect of ethnicity when forested terrain is fixed at a low level (5th percentile) and high level (95th percentile).

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It shows a significant difference in slopes. When the value of forested terrain is low, the expected count of government indiscriminate violent actions grows by approximately 1.5 incidents for every 5% growth in proportion of the largest indigenous ethnic group. When the value of forested terrain is high, the expected count of government indiscriminate actions grows by 4 incidents for every 5% growth of ethnic homogeneity. The bottom panel shows the reverse–the effect of forest for fixed levels of ethnic homogeneity. When the proportion of the largest indigenous ethnic group is low, the expected count of government indiscriminate actions grows by approximately 0.7 incidents for every 5% growth in proportion of the forested area. When ethnic homogeneity is high, the expected count of government actions grows by nearly 3 incidents for every 5% growth in forested terrain. Figure V shows a contour plot of the interaction effect, and illustrates how forested terrain significantly enhances the effect of ethnic homogeneity on indiscriminate violence.

[Figure III about here.]

[Figure IV about here.]

[Figure V about here.]

Finally, to examine the robustness of these results, we also estimated a hurdle model, a Zero-Inflated Negative Binomial model and a Zero-Inflated Poisson model. However, a Vuong test indicated that the Negative Binomial model and Zero-Inflated Negative Binomial model were virtually the same, and both consistently outperformed the Zero-Inflated Poisson regression models. As a additional robustness check, we therefore estimated the full model (Model 9 in Table I) using a Bayesian negative binomial model and provide the posterior density and credible intervals for parameters.[25] Table II shows the results of the analysis. Figure VI shows the posterior density plots for the key variables, and indicates that the interaction effect is a significant and positive predictor of indiscriminate violence. Figure VII shows an interval plot of the posterior parameter values using 95% credible intervals. These Bayesian Negative Binomial results further reinforce the frequentist Negative Binomial estimates shown in the Table I. Both the proportion of the largest indigenous ethnic group and its interaction with the proportion of forested terrain display positive and statistically significant relationships with the government's propensity to engage in indiscriminate violence during counterinsurgency campaigns.

[Table II about here.]

[Figure VI about here.]

[Figure VII about here.]

While the North Caucasus is arguably the region with highest levels of ethnic diversity in the Russian Federation, we find that indiscriminate violence within the region is disproportionately located in ethnically homogeneous districts, especially those that are also densely forested, because the government has more difficulty penetrating such districts, finding cooperative informants and acquiring the necessary intelligence for selective targeting of insurgents. In other words, state capacity in these locations is low. Low tax revenues serve both as an indicator of low state capacity in the region and

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simultaneously reinforce it.[26] Ethnically tight communities tend to possess high levels of group solidarity and offer fewer cooperative informants, generating an information scarce environment for the counterinsurgency, which forces the government to engage in more indiscriminate actions, even when it is keenly aware that these may prove counterproductive. The difficult terrain in the North Caucasus also hinders the central government's efforts to find actionable intelligence and to extract taxes, which renders the central state weaker and further enhances the effect of ethnic homogeneity on the use of indiscriminate violence.

Conclusion

This article set out to investigate the sources of spatial variation in the government's use of indiscriminate violence. It develops an information-based theory and derives three testable hypothesis that could explain variation in the government's use of indiscriminate violence in counterinsurgency warfare. The evidence is consistent with the argument that ethnically homogeneous districts offer fewer cooperative informants and less reliable intelligence, which forces the government to resort to more indiscriminate tactics. Environmental factors, such as forested terrain, further constrain intelligence collection. Using new disaggregated data on indiscriminate violence, ethnic structure and terrain in Russia's North Caucasus region, we find that the government is most likely to use indiscriminate counterinsurgency tactics in ethnically homogeneous and densely forested areas. The principal logic we propose emphasizes the role of information, which is consistent with other arguments proposed in the literature, but expands on this by showing that information is endogenous to local ethnic and environmental structures.

While we believe this study represents an important contribution to the field, we also wish to acknowledge several limitations. The first is empirical: we analyze news reports about violent events, which may introduce some bias because it is inherently difficult for journalists to gather accurate and reliable information about conflict zones. This is a problem that is unfortunately endemic to conflict studies that rely upon news reports. On the other hand, indiscriminate acts like air raids are often hard to miss and harder to cover up from journalists, so it seems likely that many if not most events have been captured in the data. Expert survey codings do not suffer from this bias, but must confront other sources of measurement error and expert prejudice. Since the objective was to test a set of three theoretically motivated hypotheses using highly disaggregated data on violence, social structure and the natural environment, this article has not engaged in detailed process tracing of exactly how governments decide when and where to use indiscriminate counterinsurgency tactics, and how noncombatants decide when and how much to support the insurgents. More work in this area is needed to provide more depth to the proposed causal mechanisms and to unpack some of the interactions identified. While we present some anecdotes, rich case studies are needed to delve deeper into these processes. Finally, data limitations also circumscribe our analysis to the period 2000-2011. We suspect that our arguments may apply to the earlier and subsequent eras as well, but we are unable to test this conjecture at this time.

We conclude by noting that local ethnic structure and terrain jointly shape counterinsurgency strategies by influencing the availability and cost of information to the government. On this basis, we have shown that areas characterized by more indigenous ethnic homogeneity and forested terrain are more likely to be targets of indiscriminate violence. The results also show that the effect of ethnic homo-

geneity is enhanced by the presence of densely forested terrain. As recent examples in Libya, Egypt, Afghanistan, and Syria illustrate, indiscriminate violence is fundamentally influenced by the government's ability to penetrate local ethnic structures, to encourage ethnic defection and to exploit satellite intelligence and digital surveillance. These opportunities are rare in areas dominated by a single native ethnic group, and even more under dense forest cover. Identifying the micro-determinants of hotspots for indiscriminate violence is an important goal that can enrich our theories of the dynamics of violence in civil wars, but it is just a first step toward mitigating its occurrence and protecting civilians from deadly collective targeting.

Notes

[1]We define indiscriminate violence consistent with recent studies (Lyall, 2009, p. 358), as 'the collective targeting of a population without credible efforts to distinguish between combatants and civilians. This definition assumes that the nature of violence (selective or indiscriminate) is independent of the scale of the state's violence.'

[2]Their case study of El Salvador shows that indiscriminate violence is most likely in regimes without the institutional machinery, economic resources or political will to address opposition challenges through more selective or accommodative policies.

[3]In a study of guerrilla warfare in the Greek civil war, Kalyvas focuses on how violence is used to exert control and gain collaborators, especially in areas where one side is locally dominant, but is losing control to the enemy–i.e., where state capacity is on the decline.

[4]Downes also shows that democracies are no less likely to utilize indiscriminate violence. He provides supportive evidence using a study of British behavior in the Boer insurgency in South Africa, and in colonial wars in Cuba, the Philippines and Libya. In interstate wars of conquest, Downes argues that indiscriminate violence is used to eliminate unwanted populations from conquered territory. Also see Valentino (2000) and Valentino et al. (2004).

[5]Kocher and Kalyvas provide unique evidence of this dynamic from the U.S. Phoenix program during the Vietnam war.

[6]For evidence that the government's use of indiscriminate violence can stem an insurgency by revealing that 'the insurgency cannot credibly protect the population or respond in kind, feeding the perception that the insurgency is both likely to lose and is endangering locals without bringing tangible benefits.'...and therefore that 'indiscriminate violence's effects are suppressive, rather than escalatory, in nature', see Lyall (2009), p. 338.

[7]The reason why the conflict did not initially spread to other areas of the region that held a grudge against Moscow, however, was no doubt partly due to Moscow's response to Chechnya's quest for independence–neighboring Caucasian nations updated their beliefs about the probability of success.

[8]This paper uses ethnic homogeneity as a proxy for local in-group solidarity, but other measures might be used if data were available. In-group solidarity tends to be lower in areas marked by high rates of intermarriage and intermixing, so district level measures of endogamy and spatial segregation would have been ideal, but such data were unfortunately unavailable.

[9](Fjelde and Hultman, 2013, p.2) is a recent exception, which studies communal conflicts between ethnic groups (rather than conflicts between the state and an insurgency) and argues that "ethnicity [in Africa] provides a criterion for collective targeting when individual wartime affiliations are not known."

[10]One of the most violent regions in the North Caucasus, Dagestan has also the highest number of invalids that receive support from the government. Zakir Magomedov, Nash Jihad - Korruptsiya, Ili Otkuda V Dagstane Stolko Invalidov (Our Jihad is Corruption, Or Why There Are So Many Invalids in Dagestan). http://www.echo.msk.ru/blog/publicpost/996210-echo/

[11](Kalyvas, 2008, p.1045) defined ethnic defection as 'a process whereby individuals join organizations explicitly opposed to the national aspirations of the ethnic group with which they identify and end up fighting against their coethnics.'

[12]http://www.gazeta.ru/politics/2008/09/24_a_2842014.shtml

[13]http://ria.ru/trend/attempt_sulim_yamadaev_30032009/. Also see: http://www.interfax.ru/russia/txt.asp?id=71695. The Russian government co-opted father Ahmad Kadyrov and his son, Ramzan Kadyrov, as the pro-Russian rulers of Chechnya in 1999. The Russian government benefited from a split within the pro-independence Chechen movement as the grand mufti of pro-independence Chechnya, Ahmad Kadyrov was fired from his position by the pro-independence Chechen government and declared an 'enemy of the Chechen people' (See http://kadirov.ru/node/88). It is plausible that the split in the insurgency preceded the government's plans for receiving ethnic defectors, consistent with the logic in Staniland (2012).

[14]If the government is willing to pay the price of using indiscriminate violence, why should it be constrained by anything at all? One might suggest that an ethnically Russian central government is unconcerned about collateral damage during counterinsurgency campaigns in ethnically non-Russian regions. Russia's use of indirect rule in Chechnya, rather than more indiscriminate violence, indicates that the central government still prefers to resolve the conflict through less violent means, by delegating power to the local Chechens, even if it has less concern for natives than for Russians in the region. The central government in Russia also cracked down on independent media at the same as it cracked down in the insurgency, allowing Putin to control the media's reporting on the counterinsurgency. The most notorious example is the takeover of the independent TV channel, NTV, from its owner, Russian oligarch Vladimir Gusinsky, who was briefly detained in 2000, but managed eventually to leave the country.

[15](Guevara, 1997, p.63), cited in Hendrix (2011)

[16]It is key that this is measured at the district level. The Russian Federation has a relatively low ethnic fractionalization score, since nearly 80% of its population are ethnic Russians, but like many countries it has a highly variable ethnic structure at the local level.

[17]However, Esteban et al. (2012) and Collier and Hoeffler (2004) did not find evidence for the effect of terrain variables.

[18]Caucasian Knot website, http://www.kavkaz-uzel.ru/articles/239836/.

[19]Russian State Statistical Service, 2010 census results, found at http://www.gks.ru. The Russian Federation as a whole is relatively homogeneous in ethnic terms–about 80% of its population is ethnically Russian. At the same time, the Republic of Dagestan in the Russian North Caucasus is ethnically very diverse with the largest ethnic group amounting only to around 30% of the republic; the second largest group comprises 17%, the third ethnic group in line makes up 15%, and the fourth group 13%. When we examine detailed data on the district level in Dagestan, however, we see that out of 52 administrative units, about half (24) have a single dominant ethnic group that comprises over 90% of the administrative unit's population. It is in these homogeneous districts where we would expect the government to use the most indiscriminate violence because they operate in an information poor environment in which the ability to target selectively is diminished.

[20]This is our operational definition. For our conceptual definition, see note 1. One possible criticism of our operationalization of the dependent variable is that the use of artillery, air raids and other sophisticated weaponry does not reflect 'low' state capacity. Indeed, the Russian government has been known to use highly sophisticated weapon systems against insurgents in the North Caucasus. This in fact supports the paper's claim because when the government has to resort to weapon systems, artillery and air raids that inflict indiscriminate damage, even if these systems are of the latest generation, the government has failed to selectively target the insurgents and to contain the rebellion at an early stage when massive military machinery was not needed.

[21]These districts are nested within 9 regions (republics): Adygea, Chechnya, Dagestan, Ingushetia, Kabardino-Balkaria, Karachaevo-Cherkessia, Krasnodar region, North Ossetia and Stavropol region. Indiscriminate government violence was logged for this figure to improve the visibility of its distribution across districts. Adygea and Krasnodar are excluded from this figure because the shape file including these two regions is not currently available, but these two regions are included in the empirical analysis.

[22]The data on the ethnic composition of districts in 2002 is drawn from an online project that maps ethnicity in the Caucasus, http://www.ethno-kavkaz.narod.ru. Additional data on ethnic composition were drawn from O'Loughlin and Witmer (2012).

[23]Urbanization is measured on a four point ordinal scale that ranges from entirely rural districts, rural districts with cities as administrative centers, districts with only cities, and capitals with some adjacent rural settlements.

[24]The reason for focusing on the indigenous population of the region, instead of the largest ethnic group, is because the largest group is some districts is Russian rather than native and our argument is about the dynamics in a 'sons of the soil' conflict. Our measure is therefore a better measure of the key cleavage in the region, which is characterized

by a sharp ethnic division between the central government, associated with Russian ethnicity, and the North Caucasus, populated largely by native groups.

[25]We used R package *bayesm* (Rossi., 2012) for estimation of a Negative Binomial Bayesian model with a weak prior of $\beta = 0$. We had to log the population variable to allow for the model's convergence.

[26]Samye Rastochitelnye: Minfin raskritikoval Severny Kavkaz za Dorogie Avtomobili i Nizkuyu Sobiraemost Nalogov [The Most Wasteful: Ministry of Finance Criticized the North Caucasus for Expensive Cars and Low Tax Revenues], http://vz.ru/economy/2013/8/19/646277.html

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Table I: Negative Binomial Models

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Population*10000	0.03						0.05*		0.04*
	(0.02)						(0.02)		(0.02)
Urban	-0.11						-0.03		0.08
	(0.22)						(0.18)		(0.18)
Elevation*1000		1.47***						-0.78+	-0.73+
		(0.39)						(0.41)	(0.40)
Oil		2.19***						0.68	0.80+
		(0.49)						(0.42)	(0.42)
Forest			2.77***		1.47*	-0.28	-0.48	-0.18	-0.37
			(0.70)		(0.62)	(0.92)	(0.91)	(0.89)	(0.88)
Ethnicity				2.98***	2.61***	2.10***	2.16***	1.97***	1.93***
				(0.35)	(0.34)	(0.42)	(0.43)	(0.46)	(0.46)
Forest x Ethnicity						3.45*	3.53*	5.07***	5.46***
						(1.51)	(1.50)	(1.47)	(1.45)
Log-likelihood	-594.50	-585.23	-585.77	-566.56	-563.47	-561.22	-558.90	-554.41	-551.42
Deviance	206.73	206.11	206.18	204.94	205.20	205.09	205.12	206.00	206.02
AIC	1197.01	1178.45	1177.55	1139.11	1134.94	1132.44	1131.80	1122.82	1120.84
BIC	1210.20	1191.64	1187.44	1149.01	1148.13	1148.94	1154.89	1145.91	1150.53

N=200, Standard errors in parentheses, Significance codes: 0.0001 '***' 0.001 '**' 0.01 '*' 0.05 '+'

Table II. Bayesian Negative Binomial Model

	2.5%	Posterior Mean	97.5%
Population	0.0011	0.3701	0.7303
Urban	-0.2268	0.1117	0.4600
Elevation	-1.6222	-0.7075	0.2067
Oil	-0.2323	0.6817	1.5288
Forest	-1.8346	-0.0813	1.9831
Ethnicity	1.0820	1.9436	2.8407
Forest x Ethnicity	1.9933	5.6605	9.3080

N=200. 95% Credible Intervals.
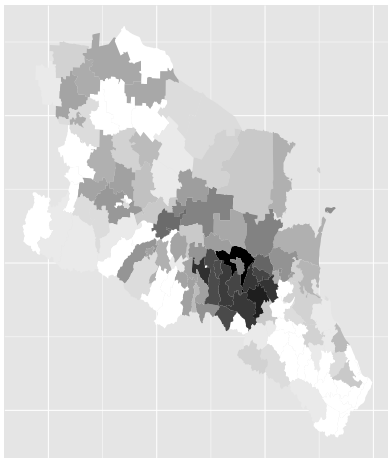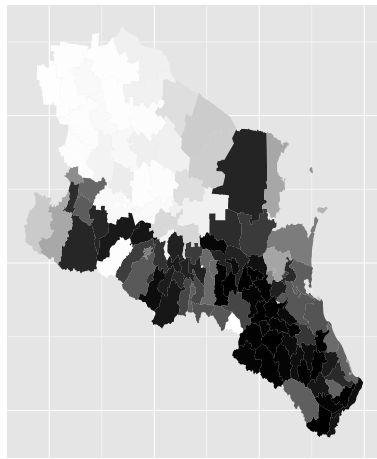
(a) Indiscriminate Violence (b) Largest Indigenous Ethnicity (c) Forested Terrain
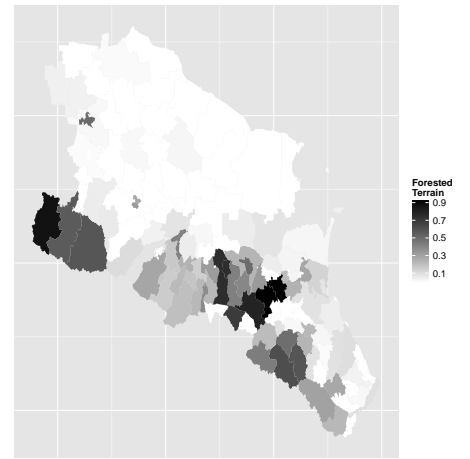
Figure I: The spatial distribution of indiscriminate violence, largest indigenous ethnicity and forested terrain in the North Caucasus, 2000-2011.

Figure II: The marginal effects of the proportion of the indigenous ethnic population (top) and the proportion of forested terrain (bottom) on the expected count of indiscriminate violent actions.

Interaction of Ethnicity and Forested Terrain
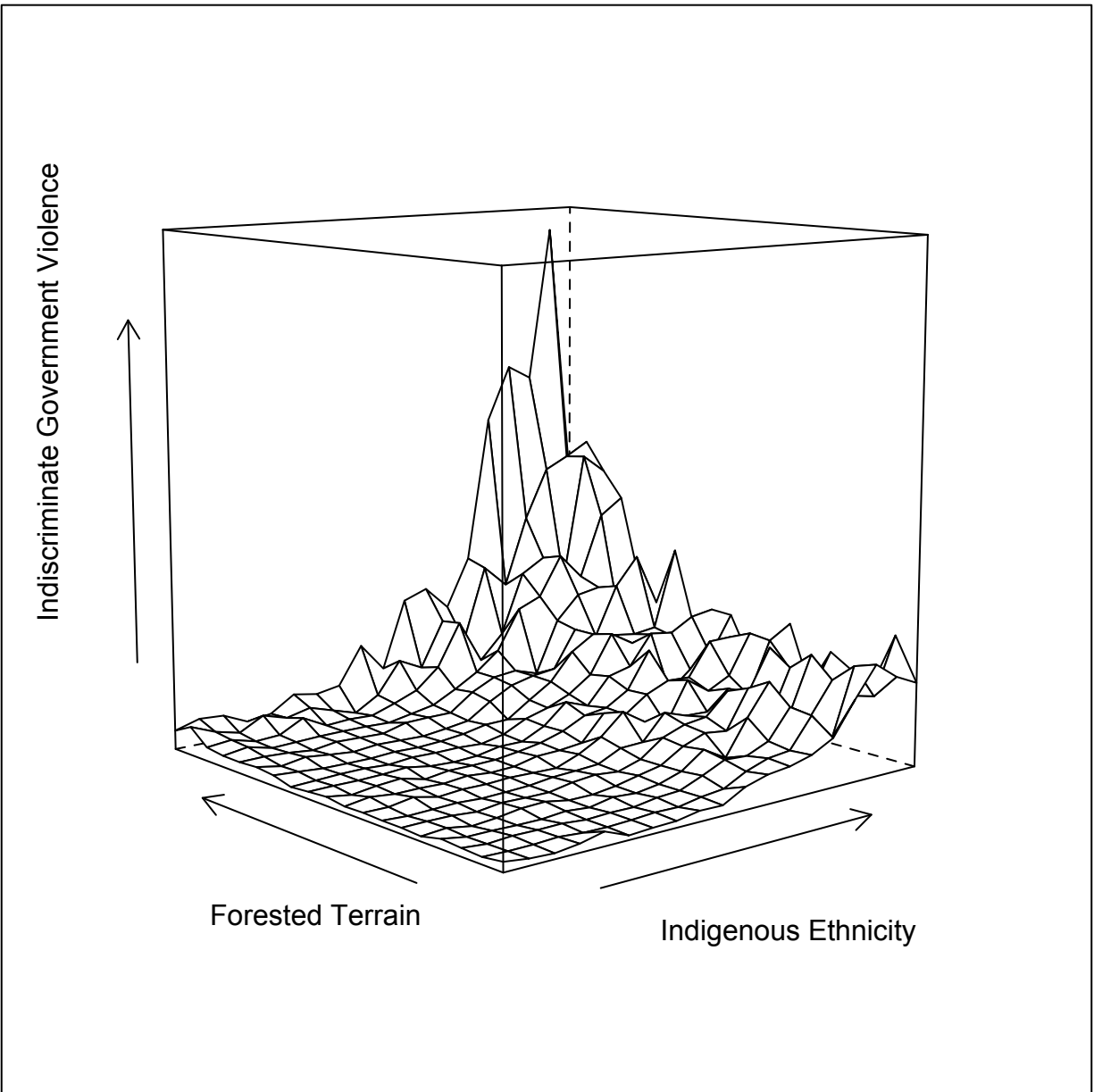
Figure III: Wireframe plot of the interaction between indigenous ethnic population and forested terrain on indiscriminate violence (the vertical axis).
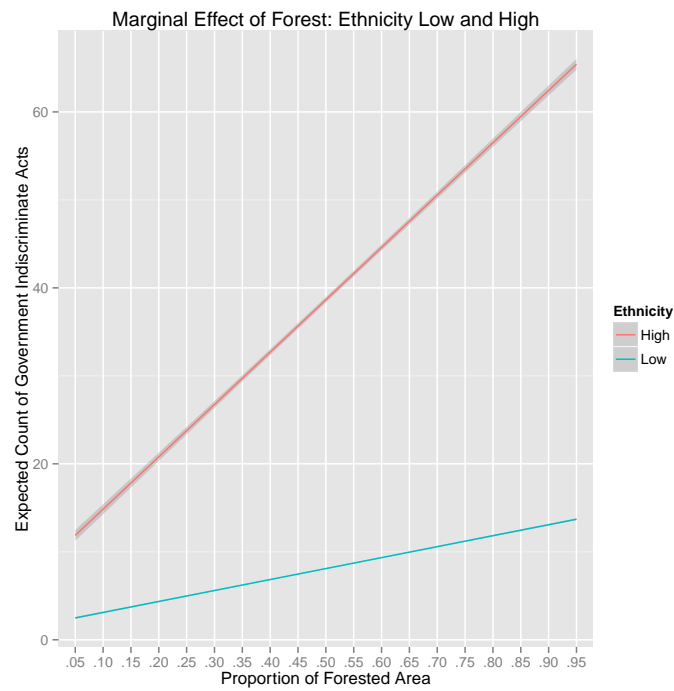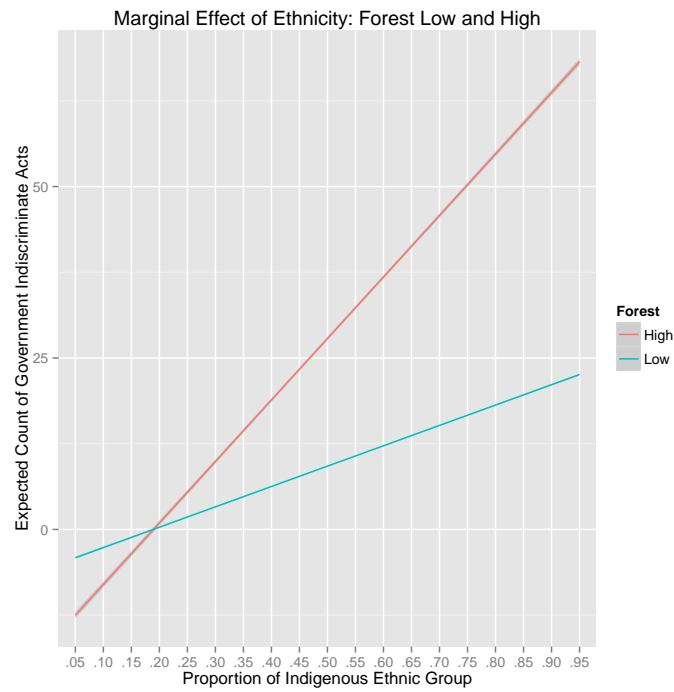
Figure IV: Interactive Effect of Indigenous Ethnic Population and Forested Terrain on Indiscriminate Violence for fixed values of each predictor. The top figure shows how more forested terrain strengthens the effect of indigenous ethnicity on indiscriminate violence. The bottom figure displays how more indigenous ethnic homogeneity strengthens the effect of forested terrain on indiscriminate violence.
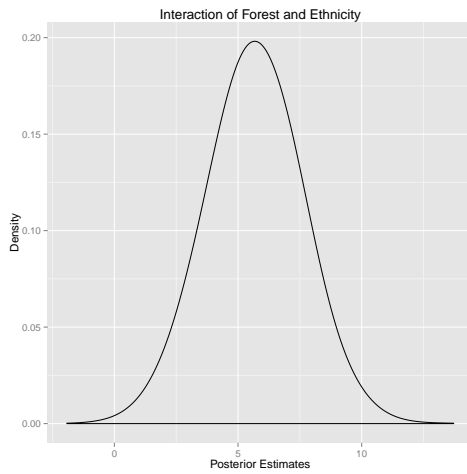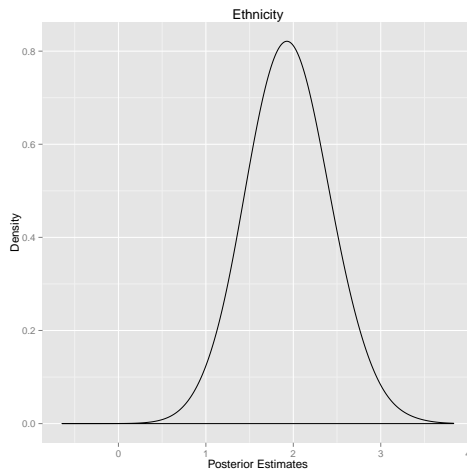
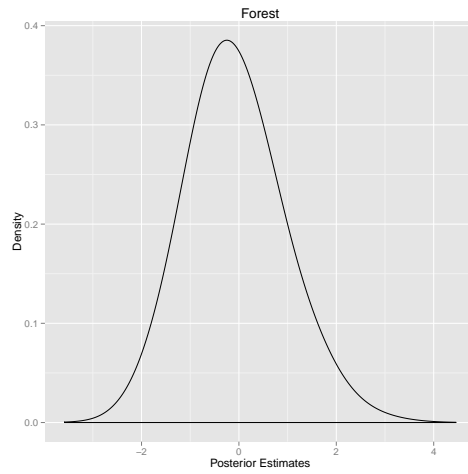Slice at Population = 73068.41, Urban = 1.61, Elevation = 0.46, Oil = 0.63
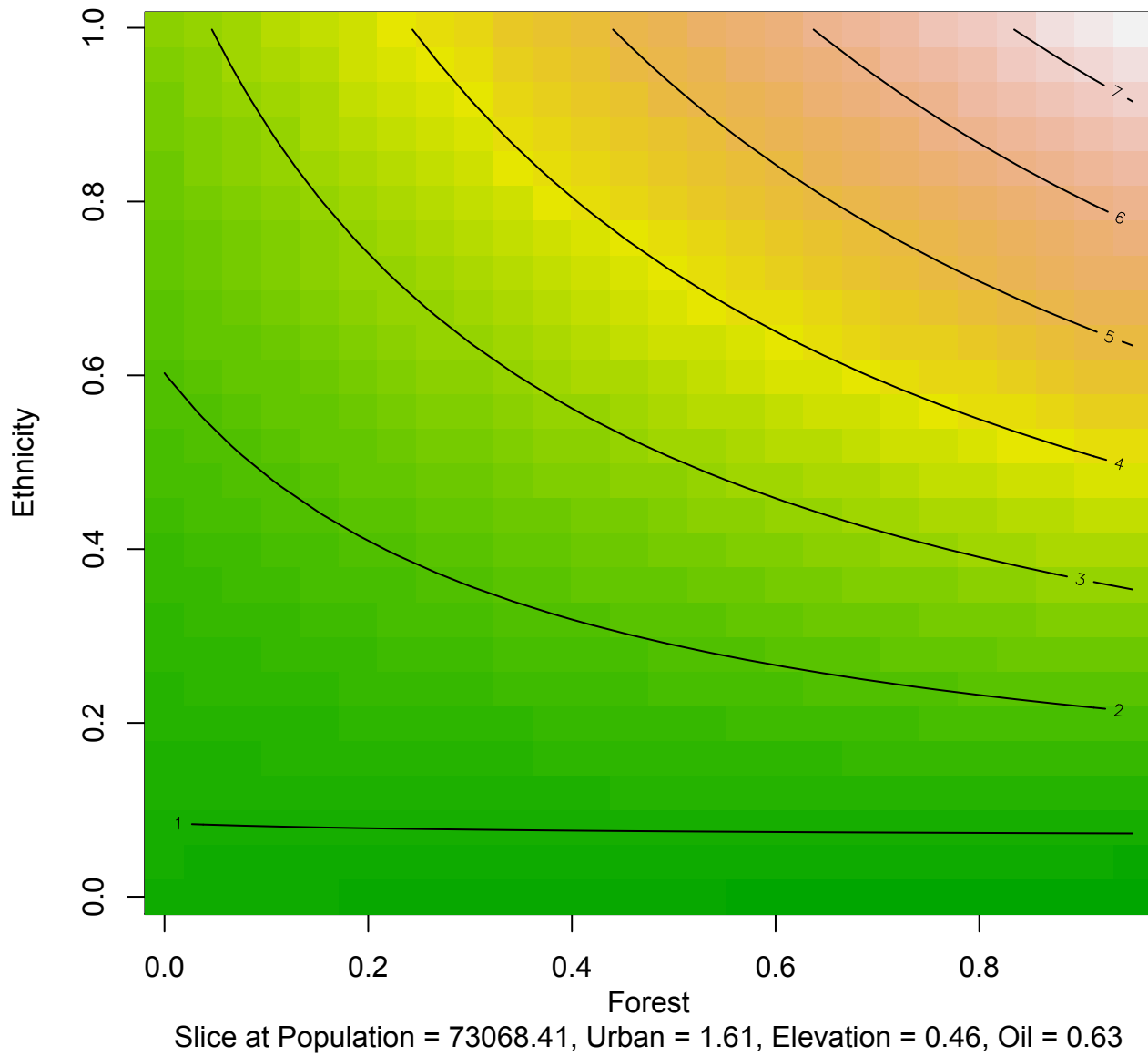
Figure V: Contour Plot depicts the interaction of forested terrain and indigenous ethnic homogeneity. Forested terrain enhances the effect of ethnic homogeneity on the count of indiscriminate violence events.

(a) Interaction of Forest and Ethnicity

(b) Ethnicity

(c) Forest

Figure VI: Density plots of posterior estimates from a Negative Binomial Bayesian model with a non informative prior of $\beta = 0$. The plot depicts interactive effect of 'Indigenous Ethnic Population' and 'Forested Terrain' on Indiscriminate Violence along with the constitutive terms of interaction.
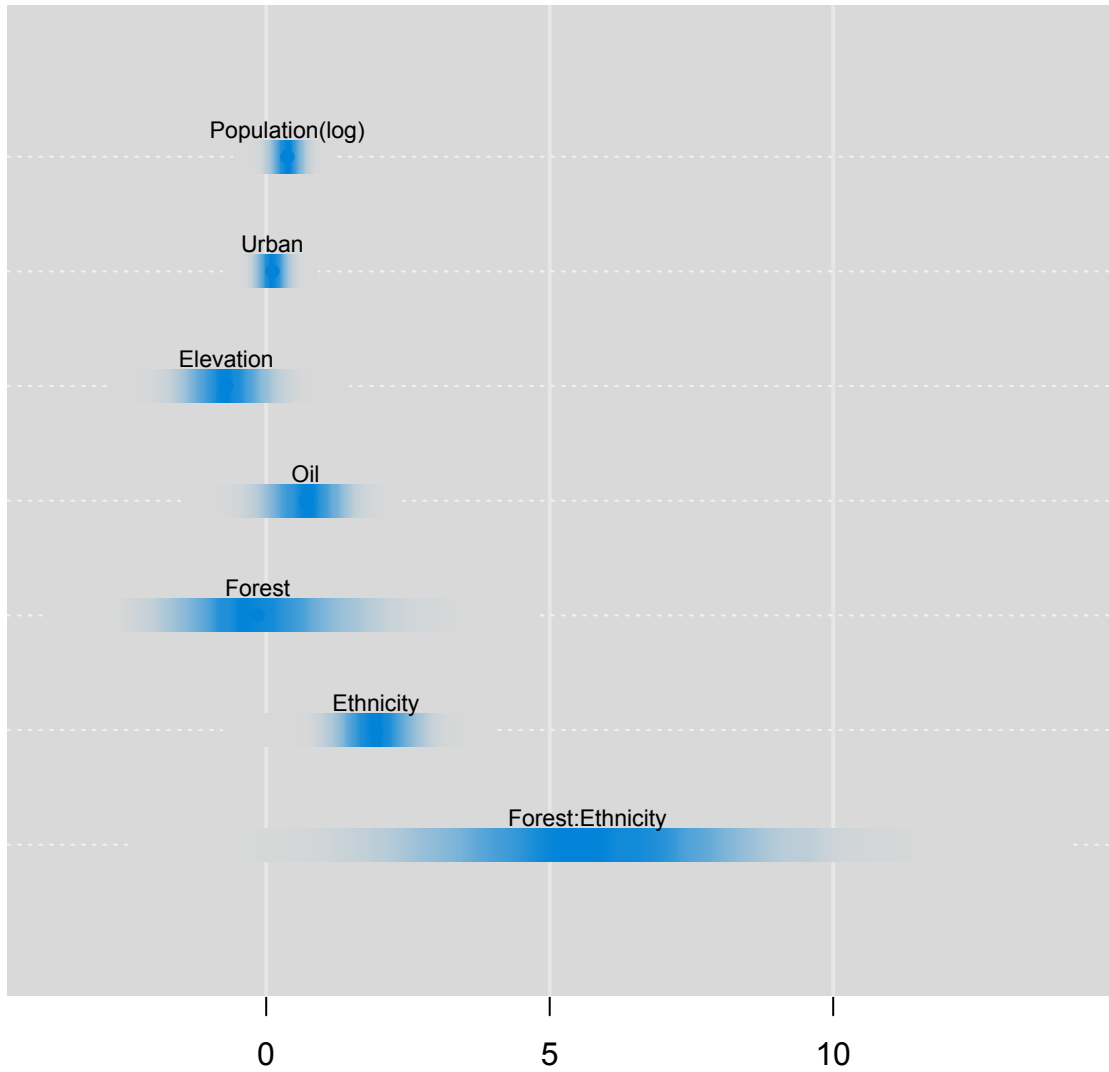
Figure VII: Interval Plots of the Posterior values from a Bayesian Negative Binomial model (with a non informative prior of $\beta = 0$). The bottom row, labeled 'Forest:Ethnicity', depicts the interactive effect of 'Indigenous Ethnic Population' and 'Forested Terrain' on Indiscriminate Violence.