

Rebel Institutionalization and the Timing of Political Violence*

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Abstract

Identifying a clear relationship between rebel group structures and the use of violence faces the challenge that group structures rarely change over time. We exploit the analytical advantage provided by religious holidays to address this issue using the principal-agent framework. Religious holidays serve as a focal point and reduce group coordination costs, but also raise the societal costs of violence. We argue the principal of rebel groups is more sensitive to the increased societal costs than the agents and thereby attempts to restrain the agents from attacking during religious holidays. However, the extent to which these attempts are successful depends on the group's institutionalization level. We test the theory by first conducting microlevel analysis of Islamic separatist groups in three Southeast Asian countries and then analyzing a cross-sectional sample of Islamic rebel groups. Results show highly institutionalized groups are less likely to attack during religious holidays than in other days.

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Introduction

One central question in the study of intrastate conflict is what explains variations in the use of political violence across rebel groups (Weinstein, 2006; Jo, 2015). Scholars have reached a consensus that organizational structures are crucial in explaining patterns of violence, yet they disagree regarding the direction of the effect. Some claim that more organized and disciplined groups are capable of committing more lethal terrorist attacks (Heger, Jung, & Wong, 2012). Others argue that more organized and disciplined groups are better at controlling the use of political violence (Humphreys & Weinstein, 2006).

One challenge of identifying a clear relationship between organizational structures and the use of political violence is that organizational structures rarely change over time (Wood, 2014). In this paper, we exploit the analytical advantage provided by religious holidays to examine the relationship between group structures and the use of political violence. Religious holidays temporarily reduces coordination costs of rebel groups by serving as a focal point (Toft & Zhukov, 2015), but at the same time religious holidays raise the societal costs of committing violence (Hassner, 2011; Reese, Ruby, & Pape, 2017). Rebel groups with different organizational structures should vary in their responses to the double-edged effects of religious holidays.

We argue that highly institutionalized rebel groups that have a central command system and control over constituent groups are less likely to commit political violence during religious holidays than in other days throughout the year.¹ Similar to existing conflict studies that adopt a principal-agent approach (Shapiro, 2013; Salehyan, 2010), we start with the assumption that rebel group leaders (principal) delegate certain duties, such as planning attacks, to low-level operatives (agents). However, leader and operative preferences may not completely align (Shapiro, 2013). This is especially so during religious holidays. For the agents, the symbolic and spiritual meaning during sacred days serves as a focal point which temporarily reduces coordination costs so they are capable of committing more violence (Toft & Zhukov, 2015). Meanwhile, violence during sacred days allow rebel groups to impose additional terror on the society (Hassner, 2011). However, vio-

¹Our baseline throughout the paper is the same rebel group's behavior in ordinary days.

lence that disrupts the observance of religious holidays violates norms of the mainstream society and runs the risks of losing societal support (Reese et al., 2017). We argue that compared to the agents, the principal is more sensitive to the increased costs of societal support. This argument is plausible given that the principal usually has more experience and higher level of education, which allows them to see the big picture of conflict that the agents don't (Shapiro, 2013). Also, the principal tends to be the oldest members of the group (Abrahms & Potter, 2015) who most likely has personally observed the strategic fallout of violence during sacred days. While the principals of both lowly and highly institutionalized groups attempt to restrain their agents from launching attacks during religious holidays, the latter are more successful because by definition they have a central command system and exercise stronger control over operatives. As a result, highly institutionalized rebel groups are less likely to initiate attacks during religious holidays than in other days, and vice versa for lowly institutionalized rebel groups.

To test our theory, we examine patterns of political violence committed by different Islamic rebel groups during Ramadan. We focus on Ramadan for two primary reasons. First, Ramadan rotates from year to year, which makes it possible to isolate confounders in our identification such as seasonal influences. Second, Ramadan magnifies the principal-agent problem of rebel groups, making it the most likely scenario where we will observe a clear relationship between group structures and the timing of political violence. If a religious holiday is short, even a lowly institutionalized rebel group may be able to control its operatives from launching attacks in a day or two. Also, during religious holidays governments can tighten security such as increasing police patrol to deter or prevent terrorist attacks. However, because of resource constraint, it is difficult for governments to consistently employ security measures over a long period of time (Lucas, 2020). Ramadan lasts 29 or 30 days (depending on the sighting of the moon), which significantly improves the chance of distinguishing a highly institutionalized rebel group from a lowly institutionalized one.

Our research design incorporates two components. First, we conduct microlevel analyses of violence committed by Islamic rebel groups in three Southeast Asian countries

(the Philippines, Thailand, and Indonesia) disaggregated to region-day, which allow us to account for conflict dynamics obscured at the macrolevels. The selection of these countries covers Islamic rebel groups in Christian-dominated (the Philippines), Buddhist-dominated (Thailand), and Muslim-dominated (Indonesia) societies, which will increase confidence in the generalizability of our theory if it stands the test. Second, we test our hypothesis in a cross-sectional sample of Islamic rebel groups. Consistent with our hypothesis, we find that highly institutionalized rebel groups display restraint in the use of violence during Ramadan. In contrast, lowly institutionalized rebel groups are more likely to attack during Ramadan. The results are robust across different model specifications.

This paper fits with works that apply principal-agent theories to conflict studies (Shapiro, 2013; Salehyan, 2010; Salehyan, Siroky, & Wood, 2014; Abrahms & Potter, 2015). Abrahms and Potter (2015) show that leadership deficits exacerbate the principal-agent problem. We introduce a new measure of group structures and show that structural deficits also exacerbate the principal-agent problem between leaders and low-level operatives, especially during religious holidays. Also, previous studies find that the principal-agent problem can explain the *spatial* variation in the use of political violence *across* rebel groups. Our study extends the literature by showing that the principal-agent problem can also account for the *temporal* variation in the use of political violence *within* a rebel group.

This paper also contributes to the debate on the relationship between religious holidays and political violence. Existing studies exclusively focus on the aggregate level of political violence (country or province), and the empirical results are mixed at best (T. Carter, 2011; Toft & Zhukov, 2015; Medina, Siebeneck, & Hepner, 2011; Reese et al., 2017). We bring group structures back into the story and offer a theory that can potentially reconcile the mixed or even contradicted results in previous studies.

We shall emphasize that this paper does *not* indicate that the Quran is more violent than the Bible or Tripitaka. Nor do we argue that religious holidays or Ramadan in particular, are the root causes of political violence. The focus of our paper is group structures and the principal-agent problem. We operationalize religious holidays as Ra-

madan because as discussed above, it magnifies the principal-agent problem facing rebel groups and makes it most likely to observe the patterns of rebel group behavior. Future studies should probe the limits of the generalizability our study across religious holidays and across faiths.

The rest of the paper proceeds as follows. We first conceptualize rebel institutionalization and use the principal-agent problem framework to develop a theory of how rebel groups with different organizational structures vary in their response to the double-edged effects of religious holidays. We then begin our microlevel analyses with discussions on case selection strategies and historical backgrounds before estimating Poisson regression models for each rebel group. We further conduct a macrolevel analysis using a cross-sectional sample of Islamic rebel groups. The final section concludes.

Group Structures and Political Violence

Organizing is an important component in contentious politics (Tarrow, 2011). How a group is organized shapes member goals and affects policies and strategies. Scholars have linked rebel organizations to the frequency and lethality of violence (Asal & Phillips, 2018; Heger et al., 2012; Stewart & Liou, 2017). Wood (2006) finds that rebel groups with an effective command and control structure are less likely to commit sexual violence in civil war. Humphreys and Weinstein (2006) argue that warring groups with tight disciplinary structures tend to have lower level of civilian abuse and they find empirical support for this argument using a new dataset on fighting groups in Sierra Leone. A growing body of research emphasizes the roles of organizational competition (Conrad & Greene, 2015) and the interaction between the organizational hierarchies and social networks (Parkinson, 2013) in the level of violence. However, an important dimension of the enterprise of conflict study, the relationship between the characteristics of rebel groups and the timing of political violence, remains underexplored.

We argue that the level of institutionalization of a rebel group affects its timing of political violence, and the effect is magnified during religious holidays. We define

the level of rebel institutionalization as whether a rebel group has a central command system and the extent to which it exercises control over its constituent groups.² One example of a highly-institutionalized rebel is the Irish Republican Army (IRA) in the Northern Ireland Conflict between 1968 and 1998. They were well-organized and had a central command system that exercises controls of the whole group. An example for a lowly institutionalized rebel is the insurgency in Chechnya, which was “bitterly divided by internal disagreements and largely devolved control to the village-level deputies who commanded the rebel groups (Lyll, 2009, p. 339).”

Religious Holidays and Political Violence

Existing studies that explore the logic of political violence during religious holidays can be divided into two camps. Each of them theorizes the effect of religious holidays on violence in a different direction.

The first camp emphasizes the tactical benefits associated with religious holidays. T. Carter (2011) argues that it is easier to mobilize the faithful during religious holidays than in other days, which explains why the U.S. and its allies face more fatal attacks during Ramadan in Afghanistan. Similarly, Hassner (2011) points out that symbols and rituals associated with the holidays can stir up fervor with which combatants take up their arms and fight. Toft and Zhukov (2015) find that Islamic holidays provide a rallying point for the rebel groups in Chechnya, which reduces coordination costs among Jihadist groups and contributes to a spike of violence during Islamic holidays. Lucas (2020) claims that violence during sacred days imposes extra terror on the society and rebel groups may use such attacks to expose the government’s weakness and signal their resolve. Analyzing terrorist attacks in Arab League countries from 2000 to 2016, Lucas (2020) finds empirical support for his argument. Sociology and religious studies provide a new angle. Juergensmeyer (2017) suggests that religious groups may choose violence as a way to communicate with the divine. Following this logic, violence during sacred days may originate from religious groups’ desire to appease or worship a higher authority

²Note that institutionalization is not synonymous with centralization. A highly centralized group may not have effective control over its constituent group.

(Lucas, 2020).

The second camp focuses on the increased societal costs associated with sacred days. Reese et al. (2017) argue that political violence that disrupts the observance of religious holidays violates norms of the mainstream society and increases the risks of losing societal support for the rebel group. This is not to say that violent attacks in general create no societal costs, but the same attacks during religious holidays will induce additional source of anger from the communities (Hassner, 2011). While rebel groups might be able to strategically select their targets, studies suggest that violence during sacred days against a wide range of government, military, and civilian targets are less tolerable by the society (Reese et al., 2017). Many Muslim leaders and ordinary Muslims have spoken out against terrorism following violent attacks during Ramadan (Grant, 2017). Reports show that Muslim separatist groups in southern Philippines and southern Thailand reached Ramadan ceasefire agreements with the governments several times during different stages of the conflicts (e.g. BBC, 2013; Firstpost, 2017).

There are many reasons why a rebel group cares about societal support. Rebel groups depend on social networks for recruitment (Humphreys & Weinstein, 2008), sanctuary (Pape, 2006), and logistical support (Parkinson, 2013). For example, through intensive fieldwork, bin Che Man (1987) details how important community support is for the Muslim separatist movements in the southern Philippines and southern Thailand throughout the process of identity formation, mobilization, and logistics. While rebel groups could use coercion to abduct individuals into the group and extract resources from the communities, coercion itself is costly and not sustainable (Kalyvas, 2006). Moreover, rebel groups can lose support from its foreign donors for the use of violence during sacred times because foreign donors are likely to share the same norms of restraint on religious holidays (Stanton, 2013).

We attempt to integrate these competing findings on religious holidays and political violence by abandoning a general assumption that rebel groups are unitary actors. Similar to some studies that adopt a principal-agent problem framework (Shapiro, 2013; Abrahms & Potter, 2015), we conceptualize rebel groups as an organization consisted of the leaders

and operatives. While religious holidays have competing effects on violence, these effects influence the leaders and operatives differently. Both the leaders and operatives may recognize the tactical benefits associated with religious holidays, but the leaders tend to have a deeper understanding of increased societal costs. We develop our theory under the principal-agent problem framework and provide justifications for why the leaders are more sensitive to increased societal costs in the next section.

Principal-Agent Problem of Rebel Groups

We start with the same assumption in existing studies that the preferences of the principal and the agents may not perfectly align in a conflict setting (Gates, 2002; Kalyvas, 2003; Salehyan, 2010). Specifically, we begin with the assumption that the leaders (principal) of rebel groups delegate certain resources and duties to low-level operatives (agents). Delegation brings several advantages. For example, the agents possess better knowledge about the tasks at hand and delegation improves efficiency. However, the principal-agent problem may arise when the preferences and beliefs of the principal and the agents do not perfectly align. Kalyvas (2003) points out that during civil war, local actors take advantage of the war to settle private business, and goals and actions “on the ground” bear little relations to the “master cleavage” of the war. Shapiro (2013) argues that because the leaders of a terrorist group have more experience and are better at evaluating the political impact of violent attacks than lower-ranked operatives, the preference of the two actors almost always diverge.³ An Islamist rebel group Jemaah Islamiyah (JI) in Southeast Asia nicely illustrates this divergence. In 2001, local JI militias evaluated that it was not in the group’s interest to sign a peace treaty with the Indonesian government, yet the senior JI leaders concluded that a period of peace in Pos (Central Sulawesi) will be essential for facilitating the kinds of ideological outreach that can turn the region into a long-term safe haven for the group (Shapiro, 2013). Similarly, Kydd and Walter (2002) show that while leaders of the Palestinian Authority and Israel achieved significant progress in peace talk in the mid 1990s, bombing attacks carried out

³Terrorism is not an intrinsic group characteristic. We use “terrorist groups” and “rebel groups” interchangeably in this paper for convenience.

by low-level operatives (extremists) against Israelis created mistrust and pushed Israel to walk away from the table.

Following this logic, we argue that the principal of rebel groups may be more sensitive to the increased societal costs of initiating attacks during religious holidays, which provides them strong incentives to limit the use of violence during sacred times. We do not argue that the agents are completely unaware of the increased societal costs of violence during religious holidays. However, compared to the agents, the principal may be more sensitive to the costs for several reasons. First, leaders are usually the oldest members of the group and have spent the longest time fighting against the government (Sageman, 2004). Indeed, most top leaders of the groups in our main analysis are their founders (bin Che Man, 1987). In contrast, low-level operatives tend to be newly-recruits and have the least exposure to any level of combat (Abrahms & Potter, 2015). Therefore, leaders are more likely to have personally witnessed the strategic fallout of violence during sacred times and have developed strong incentives to limit the use of violence during these periods. Second, leaders generally have more education and can better see the big picture of the conflict (Shapiro, 2013). In contrast, the behavior of the agents is more likely to be driven by “local cleavages” that do not necessarily reflect the “master cleavage” of the conflict (Kalyvas, 2003). Low-level operatives are more likely to have lost close friends on the front line (Abrahms & Potter, 2015). The opportunity to avenge such personal losses can occur during sacred times or ordinary days, but when it comes, low-level operatives most likely will not let it slip away. Because of these, low-level operatives are less sensitive to the increased societal costs of political violence during sacred days compared to the leaders.

While the principal attempts to restrain the agents from attacking, highly institutionalized rebel groups should be more successful because of better information flows and monitoring system, as well as a clearer punishment and reward system. Monitoring and punishment systems are central to the explanation of the use of violence across rebel groups (Weinstein, 2006). Highly institutionalized rebel groups, by definition, enjoy a central command system and have better control of constituent groups, which facilitates

information flows within the groups and monitoring process. Also, highly institutionalized rebel groups generally have a clear punishment and reward system. For example, the IRA in Northern Ireland created an internal security department in the 1970s, which served as a judicial branch within the group to investigate failed operations and rogue members. (Moloney, 2003). If the allegations held, the responsible units were dismissed. (Heger et al., 2012). The stronger control of highly institutionalized rebel groups over their operatives may be better explained by the monitoring mechanism in some cases and the punishment system in others, but they can also exist simultaneously and strengthen each other: a strong monitoring system makes punishment decisions more convincing and credible while a clear punishment system makes the monitoring process more formidable. The IRA embraced a tradition of “Christmas Truce” with the British government and showed restraint in violence use during Christmas holidays. In December 28, 1992, two explosions occurred at a police station in Londonderry just half an hour after the “Christmas Truce” ended, but nobody was injured and damage was not serious. Before that, no attacks were reported during the three-day truce period. This example demonstrates that as a highly institutionalized rebel group, the IRA could successfully restrain its operatives from attacking during important religious holidays.

In contrast, lowly institutionalized rebel groups, by definition, have weak control over its constituencies. Their organizations do not feature a clear punish and reward system and information flow is often impeded by their group structure. As a result, although the principal of lowly institutionalized groups attempts to restrain the agent from attacking during sacred days, it will not be as successful as in highly institutionalized groups.

We should most likely to observe two distinct patterns of sacred days associated with political violence when religious holidays are long. On the one hand, it is much more difficult for leaders to restrain low-level operatives for a long period of time. Even a lowly institutionalized rebel group may be able to control its operatives from launching attacks in a day or two.⁴ On the other hand, during sacred times governments can tighten security measures such as increasing police patrol to deter or prevent violence. However,

⁴Our regression results provide support for this argument.

governments have to defend terrorist attacks with limited resources. Powell (2007) argues that governments must allocate scarce resources across different sites and operations when defending terrorism. Lucas (2020) extends the logic to temporal substitution and shows that resource constraints prevent governments from maintaining high level of security measures over a long period of time. Moreover, security measures that do not directly target terrorist can backlash and incite more violence (Benmelech, Berrebi, & Klor, 2010). Thus long religious holidays should magnify the principal-agent problem and make it most likely to observe a clear relationship between group structures and the use of political violence.

Connecting these pieces generates the following testable implications.⁵

Hypothesis 1: highly institutionalized rebel groups are less likely to commit political violence during long religious holidays than in other days.

Hypothesis 2: lowly institutionalized rebel groups are more likely to commit political violence during long religious holidays than in other days.

Research Design

We combine microlevel and macrolevel analyses to test the hypothesis. First, we conduct microlevel analyses of violence committed by Islamic rebel groups in three Southeast Asian countries (the Philippines, Thailand, and Indonesia) disaggregated to region-day, which allows us to account for conflict dynamics obscured at the macrolevels. Second, we test our hypothesis in a cross-sectional sample of Islamic rebel groups.

In the microlevel analyses, we compare Islamic rebel groups in three Southeast Asian countries: the Philippines, Thailand, and Indonesia. We focus on these three countries because they display high degree of diversity and we want our theory to be generalizable to a broader setting. Southeast Asian countries differ in their ethnicity, culture, and predominant religion (Slater, 2010; Liu, 2015). Specifically, our three cases cover Islamic rebel groups in Christian-dominated (the Philippines), Buddhist-dominated (Thailand), and Muslim-dominated (Indonesia) societies. If our hypothesis stands the test, we will

⁵In the Appendix, we discuss the concern of strategic claiming.

have more confidence that the relationship between group structures and the timing of political violence is not driven by a clash between two particular religions. In addition, our focus on Southeast Asia complements existing studies of Islamic rebel groups which disproportionately looking at the Middle East and North Africa (e.g., Medina et al., 2011; Reese et al., 2017). According to the Pew Research Center, near two-thirds of Muslims live in the Asia-Pacific region. Indeed, Indonesia, one of our cases here, has the largest population of Muslims in the world.

Our case selection strategy also builds on the idea that rebel groups across these three countries share important similarities. The rebel groups include the Moro National Liberation Front (MNLF), the Moro Islamic Liberation Front (MILF), and the Bangsamoro Islamic Freedom Fighters (BIFF) in the Philippines; the Patani Insurgencies in southern Thailand; and the Free Aceh Movement (GAM) in Indonesia. All of these rebel groups are mobilized along ethnic and religious lines instead of natural resources such as oil and diamond. Weinstein (2006) shows that initial environments shape the way insurgencies recruit participants, which in turn affect their strategic use of violence. Controlling for initial endowments alleviates the concern of endogeneity in our empirical analysis.

Furthermore, we exploits variations of group structures over time for identification. In the Philippines, the MNLF was the leading organization among Moro independent movement from 1970s to the early 1990s. However, dissatisfied with the peace talks between the MNLF and the government, hardliners in the group broke away from the MNLF and founded the MILF. History seemed to repeat itself. Disappointed by the peace talks between the MILF and the government, hardliners in the MILF broke away from the group and founded the BIFF. These three rebel groups share several commonalities but differ in their institutionalization level. The MNLF and the MILF are highly institutionalized while the BIFF is lowly institutionalized. In southern Thailand, the Patani Insurgencies enjoyed a moderate level of institutionalization before 2000 (Liow, 2006). However, in late 1990s, Malaysian government prohibited activities of the Patani Insurgencies in northern Malaysian states and arrested its major leaders, and since then the Patani Insurgencies become loosely organized. The commonalities of splintered groups in the Philippines and

the plausibly exogenous shift in Malaysian government's policy provide opportunities to better identify how rebel group structures affect the timing of political violence.

Historical Backgrounds and Group Structures

Moro insurgencies in southern Philippines

The Moro people or Bangsamoro people are the native Muslims living in the Philippines, most of whom inhabit in Mindanao, Sulu, and Palawan.⁶ After the independence of Philippine, many Moro people were deprived of their land as a result of large flows of Christian migrations. Tension between Muslims and Christian settlers escalated in the 1960s and violent conflict broke out after the imposition of martial law in 1972.

In 1972, Nur Misuari founded a separatist group—the Moro Liberation National Front (MNLF), which quickly became the leading force in the separatist movement (bin Che Man, 1987, p. 80). The MNLF was highly institutionalized. Its political wing included a Central Committee, which chose a chairman, and provincial and village committees (McKenna, 1998, p. 157) and served as the executive body that was responsible for policy-making and governing (Rudolph, 2008, p. 154). Its military wing also had a hierarchical structure in which officers are ranked from municipality to provincial level with one overall field marshal (Noble, 1976).

In 1976, the MNLF and the Philippine government signed the Tripoli Agreement, which aimed to establish an autonomous region in the southern Philippines. Although this pact was collapsed and the MNLF resumed their armed struggles in late 1977, the agreement generated a rift between Nur Misuari and other leaders who insisted on achieving full independence. In 1977, led by Hashim Salamat, some hardliners within the MNLF broke away and founded the Moro Islamic Liberation Front (MILF). The MILF developed into a powerful group in the 1980s and became the most powerful Moro rebel group in the 1990s (Tan, 2000).

The MILF is highly institutionalized. Like the MNLF, the MILF has a centralized

⁶There were two major Muslim sultanates that governed the southern Philippines and northern Borneo in history. Both large sultanates consisted of multiple ethno-cultural groups, and they were together perceived as a wider ethnic “Moro people” group by Spanish colonists.

and hierarchical structure. In addition to the Central Committee, which consists of leaders of many sectors (e.g. tribe, religion) and is responsible for decision making, there are also provincial, municipal and barangay (village) committees corresponding to structure of local government in MILF-controlled area (Taya, 2007). The local committees implement MILF's policy and govern affairs of locality. Furthermore, the MILF has a Supreme Islamic Revolutionary Tribunal and a Consultative Council; the former serves as a judicial body while the latter is the legislative body (Mapping Militants Organizations, 2019).

After years of independence struggle, the MILF and the Philippine government attempted to strike a peace agreement, which irritated hardliners within the MILF (Gray et al., 2018, p.17). In late 2010, led by Ameril Umbra Kato, some hardliners of the MILF broke away and founded the Bangsamoro Islamic Freedom Fighters (BIFF). In 2011 the MILF formally announced that it cannot command the BIFF, and hence this split started a new wave of insurgencies in the southern Philippines.

Currently there is little evidence showing that the BIFF has ever built a centralized command system. Between 2011 and 2015, the BIFF had changed three leaders: the founder and the first leader, Ameril Umbra Kato, became disabled and started to hide in 2011; the second leader, Mohammad Ali Tambako, established the Justice for Islamic Movement (JIM) in 2013 and was arrested in 2015—therefore, the JIM is believed to be defunct now; the third leader, Abdul Basit Usman, was killed in 2015 by his bodyguards. Since 2015, “The BIFF remains loosely-structured today, and is not thought to have a defined leadership structure or central chain of command (Hart, 2018).”

Patani Insurgencies in Southern Thailand

Patani Insurgencies are an ethnic and religious separatist group operated primarily in southern Thailand (historical Malay Patani Region).⁷ During the period of 1980-2000, Patani Insurgencies have some level of centralized command system. In the 1980s, the

⁷We broadly term the four major underground groups asserting Malay-Muslim separatism as “Patani Insurgencies” following the existing conflict literature (e.g. Cunningham, Gleditsch, & Salehyan, 2013). These groups were the Barisan Nasional Pembebasan Patani (BNPP), Barisan Revolusi Nasional (BRN), Patani United Liberation Organization (PULO), and Barisan Bersatu Mujahideen Patani (BBMP).

leadership of Patani Insurgencies was composed of a central committee and provincial committees. There were administrative, finance, and military sections or committees under the central committee — like the MNLF and MILF in the Philippines. Every group’s central committee, led by a chairman or a secretary-general, operated in Malaysia, but they were able to send their orders to local fighters (bin Che Man, 1987, p. 102). However, compared to the MNLF and MILF in the Philippines, Patani insurgencies “never enjoyed the same level of institutionalization...even at their height” (Liow, 2006, p. 30). Patani United Liberation Organization (PULO), one of the most powerful groups of Patani Insurgencies between the 1970s and the 1990s, was actually not well-organized until 1992, when it strengthened the armed section (Acharya & Chua, 2005, p. 174). Unlike the MNLF and MILF in the Philippines which were the leading organization coordinating insurgent attacks and resources, none of Patani separatist groups coordinated operations until the late 1990s (Chalk, 2008).

A shift in Malaysian government’s policy severely destroyed the command system of Patani Insurgencies in 1998 when the Malaysian government cracked down activities supporting Patani Insurgencies in northern Malaysian states (Liow & Pathan, 2010, p. 10). According to Chalk (2008), this policy shift reflected the Malaysian government’s determination to promote economic cooperation between Thailand, Malaysia, and Indonesia.

In the 21st century, a new mode of insurgency rose in southern Thailand featuring increasing number of violent attacks. However, these attacks confused the Thai government as there are no defined groups behind them, neither do these activities have clear strategies to achieve their assertion of independence (Chalk, 2008; Abuza, 2009).⁸

According to Liow (2010, p. 15), the current Patani insurgency is based on a dispersed cell structure: a *pemimpin* (“leader” in Malay) is responsible for several villages and has up to five *ajak* (“deputy” in Malay), each of whom supervises up to five cells, and each cell consists of about ten *juwae* (in this context, this term refers to youths participating in Patani insurgency). This cell structure is extremely lowly institutionalized. Each

⁸Abuza (2009, p. 104) points out that asking “who is behind the attacks” may not be a correct question because current insurgents did not had clear connection to previous insurgencies.

pemimpin operates independently of each other and decides their own targets and strategies. Furthermore, individual *juwae* may not even know the personal information about their *pemimpin*, and every cell can be disbanded or relocated easily (Liow, 2006, p. 15). While *pemimpin* occasionally seek cooperation to launch attacks, there is no centralized command system or leadership (Abuza, 2009, p. 125).

Acehnese insurgencies in Indonesia

Aceh is the northernmost province of the Sumatra island, Indonesia. After World War II, Acehnese people supported the independence of Indonesia, but separatist movements broke out in the 1950s when Aceh lost its quasi-autonomous status (Kingsbury, 2007).

The Free Aceh Movement (GAM) was formed in 1976 and launched its first attack in 1977.⁹ Conflict between GAM and the Indonesian government escalated following the collapse of Suharto's authoritarian regime in 1998 and the independence of Timor-Leste in 1999. In December 2004, the Indian Ocean tsunami heavily crippled Aceh, and this event helped both sides agree to negotiate. Eventually, GAM and Indonesian government signed the Helsinki Peace Agreement in 2005; since then GAM has transformed from a rebel group into a local political party (Stange & Patock, 2010).

According to Schulze (2007), GAM established a hierarchical structure including different levels of leadership, military, and civilian administrative bodies. GAM's top leadership included president, prime minister, and cabinet members. GAM's military organization had one commander of central command, 17 regional level commanders, and numerous district level and sub-district level commanders leading the troops. The defense minister of GAM, who was in Sweden, commanded the operations in Aceh via phone call. He was able to directly contact not only the commander of central command but also the 17 regional level commanders every day (Schulze, 2007). In sum, like the MNLF and MILF, GAM is highly institutionalized.

Table 1 presents a congruence test of the rebel groups we discussed above.

[Table 1 here]

⁹Members of GAM were severely oppressed by President Suharto's authoritarian administration.

Data and Variables

We measure political violence in two ways. The first measure is the count of terrorist attacks drawn from the Global Terrorism Database (GTD), which is the most widely used dataset for terrorism studies (LaFree & Dugan, 2007; Findley & Young, 2012). The GTD defines terrorism as “the threatened or actual use of illegal force and violence by a non-state actor to attain a political, economic, religious or social goal through fear, coercion or intimidation” (LaFree & Dugan, 2007). The GTD covers terrorist events against a wide range of targets, including the governments, the military, and civilians. The second measure is the count of one-sided violence drawn from the UCDP geo-referenced event (GED) dataset version 19.1 (Sundberg & Melander, 2013; Sundberg, Lindgren, & Padskocimaite, 2017). Here one-sided violence is defined as the use of armed force by a formally organized group against civilians (Sundberg & Melander, 2013).¹⁰ We will have more confidence in our theory if it holds true across two different datasets and measures of political violence. However, since the data of one-sided violence does not cover the MNLF and the BIFF, and it’s limited to the period after 1989, we focus on results using the GTD in the main analysis. Results using one-sided violence are included in the Appendix (Table 10), which is largely consistent with our main analysis.¹¹

We disaggregate these data to sub-national geographic units for each rebel group to account for local variation in weather conditions (Reese et al., 2017). Rather than using arbitrarily sized grid squares, we choose actual administrative divisions as the unit because they often represent important political, geographical, or ethnic boundaries (R. M. Wood, 2014). Thus, our dependent variable is a daily count of the number of political violence committed by a rebel group in a given region, where region is the first administrative level in a country.¹² For each rebel group, we include all the regions which

¹⁰The UCDP GED dataset also includes one-sided violence conducted by the government.

¹¹The coefficient of Ramadan for the MILF is still negative but statistically insignificant. One explanation is that one-sided violence (OSV) data for the MILF starts from 1990, and observations in the 1980s are missing. And the total number of non-zero observations decreases from 363 to 84 when changing from the GTD to OSV dataset.

¹²Thailand and Indonesia’s administrative level 1 is province, and the Philippines’ administrative level 1 is region. Information on administrative divisions is gathered from this website: <https://data.humdata.org/dataset/>

recorded at least one incident of political violence.¹³ We rely on counts of attacks rather than fatalities because data on occurrence of an attack are more reliable than estimated death counts (Wood, 2014).

Our key independent variable, Ramadan, is a dummy variable which equals 1 if the day falls on Ramadan. Information on Ramadan is collected from a website.¹⁴ We operationalize long religious holidays as Ramadan because as discussed earlier, Ramadan lasts 29 or 30 days, magnifying the principal-agent problem and making it most likely to observe a clear relationship between group structures and the use of political violence. According to our hypotheses, the coefficients of Ramadan should be negative for the MNLF, the MILF, and GAM, which are highly institutionalized; and positive for the BIFF and the Patani Insurgencies after 2000, which are lowly institutionalized. The Patani Insurgencies before 2000 enjoyed a moderate level of institutionalization, and thus we expect the coefficient of Ramadan to be negative but not statistically as strong as for those highly institutionalized groups. For comparison, we also include a dummy variable for other (short) Islamic holidays in the model.

Following Reese et al. (2017), we include a set of control variables. Because in some years other religious holidays overlap with Ramadan, we include a dummy variable for holidays of the dominant religion in each country: Christian holidays in the Philippines and Buddhist holidays in Thailand. We also include a dummy variable for secular national holidays. We provide a full list of holidays in the Appendix.¹⁵ All the other days are omitted to serve as a reference baseline. Some studies suggest that elections can spur political violence (Croft, Felter, Mansour, & Rees, 2013). Therefore we include a dummy variable “Election” which equals 1 if a day falls on the month of the general election of the country. Election information comes from Wikipedia, and we cross-check the reliability of the data referencing Nohlen, Grotz, and Hartmann (2001).

To control for government counterterrorism operations, we include a 1-day lagged

¹³We acknowledge the concern of the number of nonevent observations, and we discuss it more in the robustness checks.

¹⁴<https://habibur.com/hijri/>, retrieved on April 10, 2018.

¹⁵We extract the information of holidays from the website: <https://www.timeanddate.com>, retrieved on July 16, 2018.

measure of militant fatalities and uncategorized fatalities in a clash between the government and a rebel group in a given region. The data is drawn from the UCDP GED dataset (Sundberg & Melander, 2013; Sundberg et al., 2017). Because the earliest observation in the UCDP data starts from 1989, this variable only applies to some rebel groups. Government counterinsurgency efforts may suppress terrorist activities by destroying or weakening armed groups, yet they may also incite revenge and result in more violence attacks. Therefore we do not predict the effects of counterinsurgency on violence and leave it for empirical exploration.

A large literature shows that climate affects civil conflict (Hsiang, Burke, & Miguel, 2013). A particular concern here is seasonal weather, which could be correlated with both Ramadan and political violence. To control for seasonal weather, we include daily temperature and precipitation at the level of our geographic units. Both temperature and precipitation data are from the Climate Prediction Center (CPC).¹⁶ The CPC provides global gridded data and we employ spatial analysis to extract sub-national level data using countries' administrative level 1 shape files.¹⁷

[Table 2 here]

Table 2 presents the cross tabulation of the number of terrorist attacks committed by each rebel group. We can see a clear pattern consistent with our expectation in both terrorist attacks and one-sided violence. We also include the spatial and the temporal distributions of political violence in the Appendix (Figure 1 and Table 1-9).

Model Specifications

We estimate a Poisson fixed effects model because the Poisson estimator is more robust than the negative binomial estimator in panel data (Wooldridge, 2010).¹⁸ Fixed

¹⁶CPC Global Unified Precipitation data is provided by the NOAA/OAR/ESRL PSL, Boulder, Colorado, USA, from their Web site at <https://psl.noaa.gov/data/gridded/data.cpc.globalprecip.html>. And CPC Global Temperature data is from <https://psl.noaa.gov/data/gridded/data.cpc.globaltemp.html>. The earliest observation is 1979/01/01. Data are missing on a few days (1 for precipitation and 24 for temperature).

¹⁷Shape files are from <https://data.humdata.org/dataset/>, retrieved on Feb 10, 2021.

¹⁸The Poisson fixed effects estimator is estimated with conditional maximum likelihood, which avoids the “incidental parameters” problem which threatens the consistency of the unconditional fixed effects negative binomial estimator.

effects remove any unobserved region-specific confounders that are time-invariant. We use robust standard errors clustered at the region level to account for potential within-group correlation of the error term. We include cubic polynomials t , t^2 , and t^3 to control for time dependence, where t is the number of days from the last onset of political violence. Compared to cubic splines, cubic polynomial is easy to implement and does not suffer from the quasi-complete separation problem (D. B. Carter & Signorino, 2010). We also include a lagged dependent variable to account for potential autocorrelation.

Results and Discussion

Figure 1 plots the coefficients of Ramadan for each rebel group from the estimation of a fixed effects Poisson regression model. The pattern fits our expectation that highly institutionalized rebel groups are less likely to initiate attacks during Ramadan and lowly institutionalized rebel groups are more likely to commit violence during Ramadan.

[Figure 1 here]

Table 3 presents results of the full model. We can appropriately interpret the coefficients of the Poisson models in terms of their exponential. For example, in the first column, the coefficient of Ramadan is -1.21 and statistically significant at the 0.001 level. Holding other variables at their baseline values, the expected number of attacks committed by the MNLF when Ramadan is 0 is $exp(0) = 1$ and $exp(-1.21) = 0.30$ when Ramadan is 1, which suggests a 70 percent reduction in the incidence of violence. In comparison, the coefficients of other (short) Islamic holidays are negative across all models, which provides some assurance to our postulation that even a lowly institutionalized rebel group may be able to control its operatives in a short period of time.

[Table 3 here]

Since we do not theorize about the control variables, we should be cautious in our interpretation. There is some evidence that the BIFF initiates more attacks during Christian holidays while GAM display some restraint during Christian holidays. Buddhist holidays

appear to have no systematic effects for Patani Insurgencies. Also, our models suggest that Islamic rebel groups in the Philippines restrain from using violence during general elections. This is consistent with Crost et al. (2013), which finds that the Communist Party of the Philippines (CPP) is responsible for most of the election-related violence in the Philippines. The coefficients of government counterterrorism measures appear to be positive and statistically significant for all rebel groups, which supports the revenge theory that argues counterterrorism operations incite more violence. Also, we find no systematic effects of secular holidays on the use of political violence, which is consistent with (Reese et al., 2017).

Robustness Checks

We test the robustness of our results using a pooled sample and different model specifications.

Regression analysis using a pooled sample. In the main analysis, we estimate a regression model for each group separately, which provides more opportunities to have our hypotheses falsified. However, a potential drawback of testing the theory separately is low statistical power. This drawback is a more serious concern in our paper than in Reese et al. (2017) because they theorize a homogeneous effects of certain religious holidays, and thus they have variation in their variables of interest in each sub-group analysis. In contrast, we theorize the effects of religious holidays to differ across rebel groups, and when we test our theory separately, our main variable of interest, group structure, does not have variation in each sub-group analysis.

To address this concern, I interact group structure and Ramadan and estimate a logit model using a pooled sample. The unit of analysis is group-day, and the dependent variable is coded as 1 if there is an attack committed by a rebel group in a given day. To simplify interpretation, we code “Institutionalization” as 1 if a rebel group is highly institutionalized and 0 otherwise. We also include time polynomials and different structures of lagged dependent variable(s).

[Table 4 here]

Table 4 reports results using a pooled sample. Consistent with our theory, the coefficients of Ramadan and Institutionalization are positive and negative respectively and statistically significant across all models. More importantly, coefficients of their interaction term are negative and statistically significant in all model specifications. A marginal plot of the interaction term (see Figure 2) clearly shows that a rebel group’s institutionalization level can moderate the effect of Ramadan on the use of political violence.

[Figure 2 here]

Different Model Specifications We choose Poisson fixed effects models in our main analysis because it is more robust than the negative binomial estimator in panel data (Wooldridge, 2010). Recent simulation studies show that even in situations where overdispersion is present, there is not a clear preference for negative binomial estimators (Blackburn, 2015). Nonetheless, we report results using negative binomial regressions in the Appendix (see Table 11). The results are very similar, though coefficients of Ramadan for the MILF and GAM become less significant. If we look at the coefficient plot (Figure 2 in the Appendix), we can see that the 95 percent confidence intervals of these two coefficients barely contain zero.

Given the large number of zeros in our data, one may wonder if a binary estimator better fits the data generation process. While the data of political violence is sparse, quite a few region-day experienced more than one attack (about 20-30 percent among non-zero observations). Theoretically, a single attack in a region-day is more likely planted by low-level operatives while several attacks in a region-day usually require some level of coordination, and thus count models can better capture principals’ ability to control their agents. Nonetheless, we report results using logit models with region fixed effects in the Appendix (see Table 12). Because some covariates perfectly predict the outcome, they are dropped from the regressions automatically.¹⁹ The results are similar except for GAM. The coefficient of Ramadan for GAM changes from negative to positive, and becomes statistically insignificant. The result is driven by the fact that GAM concentrated its

¹⁹This is another reason why logit models are not a good fit for the data. All covariates with zero coefficient and missing standard errors are variables dropped from the regressions automatically by Stata.

attacks in a single day. While GAM initiated at most one attack in a given day during Ramadan, there are two ordinary days in which GAM launched 8 attacks (and eight more with over 2 attacks). Our interpretation is that those numbers reflect GAM leaders' effort to control their low-level operatives during Ramadan, but when we reduce a count outcome to a binary outcome, some noise in the data may obscure the identification of the relationship between group structures and the timing of violence.

Macrolevel Analysis

One may wonder if the findings from Islamic rebel groups in three Southeast Asian countries can be generalized to a larger setting. To gather a global sample of Islamic rebel groups, We first define Islamic rebel groups by two criteria: the majority of the members in the rebel group must be Muslim, and their ideology must be Islam. Then we manually match Islamic rebel groups in the NSA dataset to the GTD. We successfully matched 44 Islamic rebel groups between the NSA dataset and the GTD that satisfy the criteria, and we further code four Islamic rebel groups that are in the GTD but not in the NSA dataset. Eventually, we recover 48 Islamic rebel groups with information on their use of political violence and other group level characteristics.²⁰We further replicate the analysis using one-sided violence data, and the results remain consistent (see Table 13 in the Appendix). Since the GTD covers more rebel groups and wider periods of time, we focus on results using the GTD in this paper.

We choose group as the unit of analysis for two reasons. First, it is too time-consuming if not impossible to replicate the microlevel analysis for all those 48 groups. Even if we did, we would find it difficult to interpret the results as it is questionable to what extent these groups are comparable. Second, cross-sectional analysis allows us to explicitly control for factors that vary across groups (R. M. Wood, 2014). Because this research design eliminates time-series component, we adjust our dependent variable in the microlevel analysis to measures a group's tendency to initiate attack during long religious holidays. The dependent variable is the ratio of the number of terrorist attacks during Ramadan to

²⁰The Appendix provide a full list of the 48 groups.

the total number of terrorist attacks committed by a rebel group. Our key independent variable “institutionalization” is a modification of two variables in the NSA dataset. The NSA dataset has information on whether a rebel group has a clear central command system and the extent to which the central command system exercises control over the constituent groups (low, moderate, and high). We code “institutionalization” as 0 for groups with no central command system, 1 for groups with low command, and 2 for groups with moderate/high command.²¹ We provide a detailed codebook of group structures for each of the groups that is not included in the NSA dataset or has missing values on their command system. We rely on various secondary sources such as government reports, NGO reports, and academic research for the coding.²²

We include a set of control variables that may affect both rebel institutionalization and the use of violence as suggested by the existing literature (Stanton, 2013; Jo, 2015; Stewart & Liou, 2017). They include the relative strength of the rebel group to the government, whether the rebel group controls a territory, whether the rebel group receives support from a foreign government, whether the rebel group receives support from a foreign third-party actor, and whether the rebel group has a political wing. We also include an indicator for secessionist conflict as research suggests that secessionist rebels have stronger incentives to seek legitimacy (Jo, 2015), which may affect their group structures and violence strategy. All these variables are drawn from the NSA dataset and details of the coding are included in the Appendix. In addition, we control for ideology by including a dummy variable for “Salafist jihadism” if the rebel group embraces this radical ideology. Jones (2014, p. 2) defines “Salafist jihadism” by two criteria: “first, the group emphasizes the importance of returning to a “pure” Islam, that of the Salaf, the pious ancestors; second, the group believes that violent jihad is fard ‘ayn (a personal religious duty).” We follow both the definition and coding of Jones (2014). Table 5 provides a summary statistics of the data.

[Table 5 here]

Because the dependent variable is a ratio ranging from 0 to 1, We estimate a fractional

²¹The results are consistent if we use a binary measure of institutionalization level.

²²We drop the Front islamique arabe de l’Azawad (FIAA) from the analysis because there is little information about this group.

outcome regression model as proposed by Papke and Wooldridge (1996).²³ For comparisons, we also report results with the Ordinary Least Squares (OLS) estimators.²⁴ We use robust standard errors clustered at the country level to account for potential correlation of the error terms.

[Table 6 here]

Table 6 presents the results of macrolevel analysis. Consistent with our theory, rebel institutionalization is negative and statistically significant in all specifications. As the fractional regressions capture nonlinear relationships, we use a marginal plot to help interpret the coefficients (Figure 2). It shows that if the level of rebel institutionalization increases from 0 to 1, the ratio of the number of political violence during Ramadan over the total incidents will decrease from 11.3percent to 8.6 percent; and if rebel institutionalization changes from 1 to 2, the ratio will further drop to 6.5 percent, controlling for other variables. For a rebel group like the BIFF whose level of institutionalization is 0, increasing its institutionalization from 0 to 2 implies that the theoretical number of political violence it commits during Ramadan will drop from 36 to 21, controlling for other variables.

[Figure 2 here]

Besides the level of institutionalization, the other variable that has a consistent effect across different specifications is Salafist jihadism. It suggests that Salafist-jihadist groups are more likely to initiate attacks during Ramadan than in other days, controlling for other variables. Indeed, Al Qaeda and the Islamic State are reported to use Ramadan as a marker to call for new attacks.²⁵

The findings that the coefficients of important group characteristics such as territorial control, foreign supports, and political wing are not statistically significant here shall not

²³Fractional outcome regressions are more flexible than the beta regressions and can account for outcomes that include 0, which is the case in our data.

²⁴Results are weighted by the total number of incidents committed by each rebel group in both models to account for heteroskedasticity.

²⁵In May 2016, the spokesman for the Islamic State Abu Mohammad al-Adnani remarked that jihadist should “make it, with God’s permission, a month of pain for infidels everywhere (Hubbard, 1993).”

be interpreted as a contradiction to previous studies. In previous studies (e.g., Salehyan et al., 2014; Jo, 2015), their theoretical interest is the *spatial* variation in the use of violence *across* rebel groups. What we try to explain in Table 6 is the *temporal* variation in the use of violence *within* a rebel group.

Conclusion

One challenge of identifying a clear relationship between group structures and the use of violence is that group structures rarely change over time. This paper exploits the analytical advantage provided by religious holidays to examine the relationship between group structures and the use of political violence. Religious holidays serve as a focal point and reduce coordination costs among rebel groups. However, religious holidays also raise the societal costs of committing violence. And compared to the agents, the principal of the rebel group is more sensitive to the increased societal costs and thereby attempts to restrain the agents from attacking during sacred days. However, whether these attempts are successful depends on rebel groups' organizational structures. We operationalize religious holidays as Ramadan and test our hypotheses by conducting microlevel analysis of Islamic separatist groups in three Southeast Asian countries and macrolevel analysis of a global sample of Islamic rebel groups. The overall results show that highly institutionalized groups are less likely to attack during Ramadan, and vice versa for lowly institutionalized groups.

This paper speaks directly to the debate on the relationship between disciplinary rebel structures and the use of violence. Literature on genocide argues that disciplinary structure of a group enables, rather than restrains, abuse of noncombatants or even mass killings (Valentino, Huth, & Balch-Lindsay, 2004). Heger et al. (2012) also argue that more organized rebel groups are more lethal and more likely to sustain large-scale attacks over longer periods. However, other conflict studies offer a reversed logic: rebel groups with tight disciplinary structure are better at controlling the use of violence against civilians (E. J. Wood, 2006; Humphreys & Weinstein, 2006; Weinstein, 2006). Our

paper pushes the literature forward by showing that disciplinary group structures have a distributional effect on the use of political violence within a rebel group. While a rebel group with disciplinary structures may or may not be more violent in general, it becomes less violent during sacred times.

This paper fits into a growing literature of applying the principal-agent problem theory into the study of conflict (Shapiro, 2013; Salehyan, 2010; Salehyan et al., 2014). We apply the principal-agent problem framework to resolve the debate on the controversial relationship between Islamic holidays and political violence. Existing studies provide mixed or even contradicted results on this topic (T. Carter, 2011; Toft & Zhukov, 2015; Medina et al., 2011; Reese et al., 2017). We bring rebel group structures back to the story and offer a theory that can potentially reconcile previous studies.

In addition to its theoretical implications, this paper also generates important policy implications. It provides suggestions for governments on how to more efficiently allocate security resources. It suggests that during religious holidays, targeting the agents of lowly institutionalized groups can be more effective than targeting the principal. As for highly institutionalized groups, policies that raise societal costs of violence during sacred times can be effective. For example, the government can consider giving some days off for the ethnic minorities to observe their religious holidays to show more respect for cultural and religious diversity.

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Tables and Figures

Table 1: Congruence Test of Selected Rebel Groups

Rebel group	Philippines			Thailand	Indonesia
	MNLF	MILF	BIFF*	Patani	GAM
Natural endowment*	not rich	not rich	not rich	not rich	not rich
Social endowment*	Ethnic and ideological	same★	same★	same★	same★
Relative strength to gov	weaker	weaker	weaker	weaker	weaker
Radical ideology*	no	yes→ <i>no</i>	yes	no	no
Foreign government support	explicit	no	no	alleged→ <i>no</i>	alleged
Foreign third-party support	tacit	tacit	tacit	no	no
Territorial control	no	no	no	no	yes
Institutionalization	high	high	low	moderate→ low	high

* indicates coded by the authors.

★ same as on the left side.

Table 2: Cross Tabulation of the Incidents of Political Violence

	MNLF(G) 1975-1996	MILF(G) 1986-2018	MILF(O) 1990-2018	BIFF(G) 2012-2018	Patani(G) 1972-2000	Patani(O) 1992-2000	Patani(G) 2001-2018	Patani(O) 2001-2018	GAM(G) 1977-2005	GAM(O) 1990-2005
Ramadan attacks	7	15	5	56	4	0	299	156	7	2
Other day attacks	196	348	79	264	50	3	2835	1274	109	92
Institutionalization	high	high	high	low	moderate	moderate	low	low	high	high

"G" indicates the Global Terrorism Database and "O" indicates the UCDP One-sided Violence Dataset.

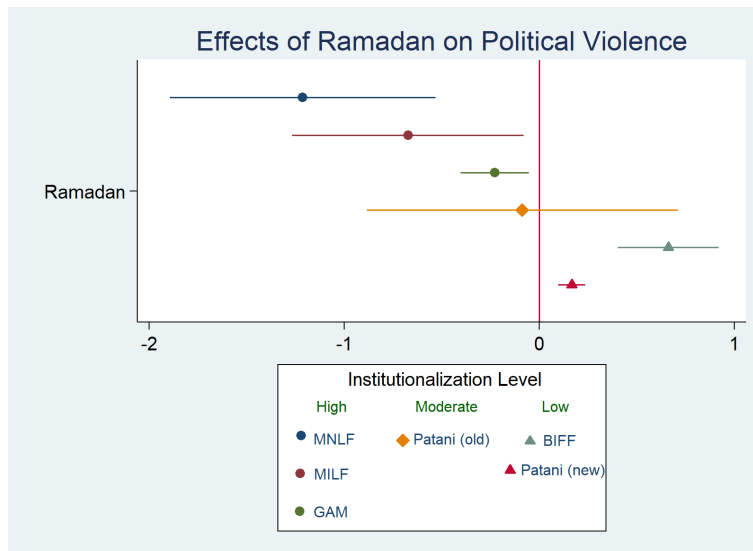


Figure 1: Coefficient Plot of Ramadan

Table 3: Sub-Group Analysis: Poisson Models

	Philippines			Thailand		Indonesia
	MNLF 1975-1996	MILF 1986-2018	BIFF 2012-2018	Patani 1972-2000	Patani 2001-2018	GAM 1977-2005
Institutionalization	High	High	Low	Moderate	Low	High
Ramadan	-1.213*** (0.347)	-0.673* (0.303)	0.663*** (0.132)	-0.086 (0.407)	0.167*** (0.036)	-0.228* (0.089)
Islamic holiday	-12.670*** (0.589)	-0.494 (0.465)	-0.634 (0.514)	-12.141*** (0.527)	-1.242*** (0.120)	-0.053 (0.080)
Christian holiday	0.451 (0.237)	-0.355 (0.281)	0.744* (0.325)			-12.742*** (0.941)
Bud_holiday				0.572 (0.836)	-0.408 (0.321)	
Secular holiday	0.219 (0.409)	-0.663** (0.214)	0.253*** (0.047)	0.194 (0.336)	-0.340*** (0.057)	-1.158*** (0.024)
National election	-1.092 (1.114)	-1.421*** (0.233)	-2.034*** (0.474)	-12.192*** (0.537)	0.006 (0.156)	-0.197*** (0.043)
Gov counter-terrorism		0.275*** (0.035)	0.478*** (0.029)		0.196*** (0.030)	0.029*** (0.000)
Precipitation	0.018 (0.010)	0.003 (0.004)	-0.019*** (0.005)	0.004 (0.005)	-0.012*** (0.001)	0.012*** (0.001)
Temperature	-0.134 (0.130)	-0.298 (0.232)	-0.074* (0.032)	0.049 (0.029)	-0.018 (0.023)	0.014 (0.027)
t	0.000 (0.000)	-0.001*** (0.000)	0.000 (0.003)	0.000*** (0.000)	0.000*** (0.000)	0.001 (0.001)
t ²	-0.000 (0.000)	0.000*** (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
t ³	0.000 (0.000)	-0.000*** (0.000)	-0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Y(t-1)	0.654*** (0.069)	0.342** (0.132)	0.442*** (0.073)	-11.786*** (0.591)	0.132*** (0.007)	0.786*** (0.008)
Region FE	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>	<i>YES</i>
Clusters	9	9	4	4	4	4
Observations	57033	104832	11304	32044	25424	37898

Unit of Analysis is region-day.

Robust standard errors in parentheses, clustered by region

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4: Pooled Analysis: Logit Models

	(1) event	(2) event	(3) event	(4) event
Ramadan	0.281*** (0.076)	0.272*** (0.078)	0.211* (0.083)	0.170* (0.085)
Institutionalization	-2.052*** (0.054)	-2.035*** (0.055)	-1.732*** (0.058)	-1.594*** (0.059)
Ramadan*Institutionalization	-0.661** (0.214)	-0.663** (0.214)	-0.576** (0.220)	-0.514* (0.221)
Islamic holiday	-0.872*** (0.256)	-0.904*** (0.258)	-0.928*** (0.272)	-1.049*** (0.285)
Secular holiday	-0.064 (0.119)	-0.064 (0.120)	-0.030 (0.125)	-0.043 (0.127)
National election	0.440** (0.146)	0.475** (0.149)	0.365* (0.159)	0.308 (0.163)
t		0.002*** (0.000)	0.001*** (0.000)	0.001*** (0.000)
t ²		-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
t ³		0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Y(t-1)			1.857*** (0.052)	1.545*** (0.055)
Y(t-2)				1.211*** (0.057)
Constant	-2.090*** (0.025)	-4.601*** (0.128)	-4.517*** (0.129)	-4.462*** (0.129)
Observations	49691	49691	49669	49659

Unit of Analysis is group-day.

Robust standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: Summary Statistics

	mean	sd	min	max	count
Ratio	0.060	0.056	0	0.208	48
Institutionalization	1.362	0.792	0	2	47
Relative strength	0.521	0.505	0	1	48
Territorial control	0.208	0.410	0	1	48
Foreign third-party support	0.333	0.476	0	1	48
Foreign gov support	0.542	0.504	0	1	48
Political wing	0.234	0.428	0	1	47
Salafist jihadism	0.188	0.394	0	1	48
Secessionist	0.292	0.459	0	1	48

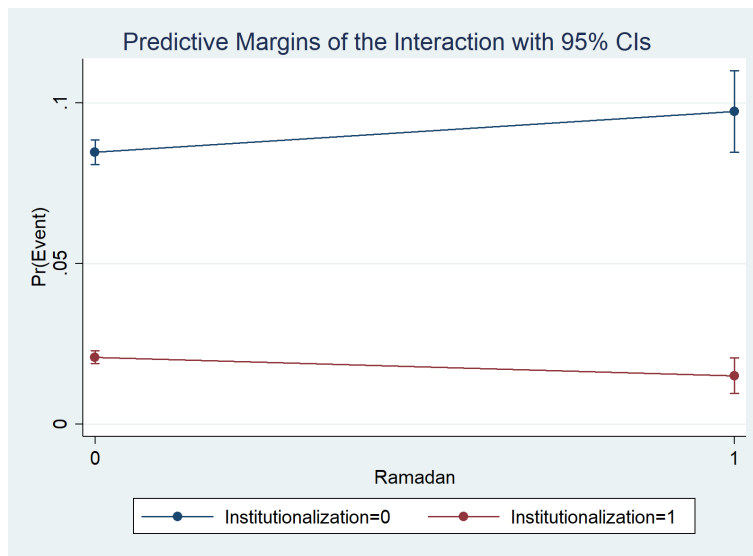


Figure 2: Coefficient Plot of Ramadan

Table 6: External Validity: Pooled Regression Analysis

	(1) OLS	(2) frac	(3) OLS	(4) frac	(5) OLS	(6) frac
Institutionalization	-0.022** (0.006)	-0.309** (0.096)	-0.022** (0.007)	-0.302** (0.097)	-0.022** (0.007)	-0.306** (0.102)
Relative strength	-0.014 (0.010)	-0.189 (0.140)	-0.002 (0.014)	-0.010 (0.210)	-0.002 (0.014)	-0.009 (0.207)
Territorial control	0.024* (0.012)	0.324 (0.185)	0.022 (0.014)	0.275 (0.204)	0.021 (0.015)	0.267 (0.203)
Foreign third-party support	0.020** (0.007)	0.303** (0.104)	0.014 (0.007)	0.202 (0.105)	0.013 (0.009)	0.195 (0.120)
Foreign gov support	0.014* (0.007)	0.172 (0.091)	0.025* (0.011)	0.313* (0.140)	0.025* (0.011)	0.314* (0.141)
Political wing			-0.019 (0.015)	-0.261 (0.241)	-0.019 (0.016)	-0.257 (0.246)
Salafist jihadism			0.020* (0.009)	0.290 (0.157)	0.020* (0.009)	0.291 (0.154)
Secessionist					-0.001 (0.008)	-0.021 (0.114)
Constant	0.096*** (0.012)	-2.251*** (0.161)	0.084*** (0.015)	-2.420*** (0.221)	0.085*** (0.017)	-2.407*** (0.256)
<i>N</i>	47	47	46	46	46	46

Unit of analysis is group.

Robust standard errors in parentheses, clustered by country

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$