Game of Drones: The Effect of Drone Strikes on Terrorists' Tactical Diversity

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Abstract

The focus of U.S. foreign policy is shifting. Large troop deployments to combat terrorism have been eschewed in favor of limited interventions, using targeted killing strategies to debilitate enemies. In both the Obama and Trump administrations, drone strikes have been a cornerstone of the country's counter-terrorism tactics. Prior research has attempted to assess the impact of the drone program on a terrorist organization's subsequent attack frequency and lethality. This study uses a multi-method approach, comprised of quantitative regression analyses and a case study of AQAP (Yemen) in 2012, to assess how terrorist organizations adapt and react to drone campaigns. A dataset of 175 organization-country-year observations was constructed to identify the possible relationship between a drone campaign and a terrorist organization's tactical diversity. I find that drone campaigns can, at first, cause terrorist organizations to increase the number of tactics employed in a given year and the number of different target-types attacked in a given year, and this effect is driven by terrorists seeking to manage risk and improve their strategic position in conflicts against local governments. Once a terrorist organization has experienced a significant number of drone strikes, a drone campaign may have a debilitative effect; tactical diversity should decrease so long as counter-terrorists or local governments can maintain effective control over territories. Drone strikes may be an effective counter-terrorism tool under limited conditions, which are largely driven by local state capacity and legitimacy. Policymakers should carefully weigh the impact of drone strikes, their civilian casualties, and the broader U.S. counter-terrorism strategy when deciding whether drone strikes are an apt tool.

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Introduction

The future of United States warfare is changing; ground interventions, troop deployments, and prolonged overseas offensives are no longer a priority for military engagement. Worldwide, conventional conflicts are becoming less common.[1] The necessity for largescale troop deployments is decreasing each year, and the military is adapting. Additionally, the American public resoundingly disapproves of ground force invasions.[2] Their opinion comes in response to foreign policy blunders in Iraq, extended involvement in Afghanistan, and an expanding slate of Middle Eastern conflicts that threaten to entangle the U.S. military. At the same time, the focus of the U.S. military is shifting away from the Middle East. The threats of Russia and China headline the U.S. military's list of strategic objectives, and recent whitepapers underscore the trade-offs the military will require to keep pace with the growing threat from modernized Chinese and Russian military forces.[3] Those trade-offs will demand a smaller footprint in the Middle East, yet political pressure and security interests mandate continued U.S. involvement in the region.[4] Drones are the military's answer to that conundrum, supporting local ground forces in their fight against terrorism while allowing for the United States to influence the battlespace.

The frequent use of a military tool alone warrants further investigation, but the reliance on the drone program as a cornerstone of the nation's long-term military strategy solidifies its

[1] Kavanagh, Jennifer. *The Past, Present, and Future of U.S. Ground Interventions: Identifying Trends, Characteristics, and Signposts*. Research Report, no. 1831. Santa Monica, Calif: RAND Corporation, 2017, p. 47.
[2] Pew Research Center for the People and the Press. "Widespread Uncertainty About America's Place in the World." Pew Research Center, May 5, 2016. https://www.people-press.org/2016/05/05/4-u-s-military-action-against-isis-policy-toward-terrorism/.
[3] Cancian, Mark F. "U.S. Military Forces in FY 2020: The Strategic and Budget Context." Center for Strategic and International Studies, September 30, 2019. https://www.csis.org/analysis/us-military-forces-fy-2020-strategic-and-budget-context.
[4] Guerra, Felix. "A Holistic Strategy? Examining How Armed Drone Strikes Interact With Other Elements of National Power." Master's Thesis, Naval Postgraduate School, 2017, p. 4.

importance. Indeed, the recent attack on Iranian General Soleimani hints at an expansion of drone use to theatres beyond that of conventional counter-terrorism operations.

An increasing portion of the security studies literature is analyzing the impact of drone strikes on terrorist organization activity — attack frequency, attack lethality, propaganda output, and organizational mortality are often the specific subjects of inquiry. Yet, clear answers are hard to find in the literature, and, importantly, there has not been a strong attempt at exploring the causal mechanisms that may explain the program's success or failure. My thesis will attempt to clarify the pathways by which drone strikes affect terrorist organizations. To do so, I will ask the following question: do drone strikes affect the tactics employed by terrorist organizations?

Tactical diversity — the total number of attack types used by terrorist organizations in a given year — is often ignored as a dependent variable in the drone literature and the broader security studies literature.[5] If addressed, terrorist tactics are discussed briefly in support of a hypothesis. Vignettes demonstrating that drone strikes may affect terrorist behavior are a "proof-of-concept" to explain potential quantitative results.[6] Yet, an exploration of drone strikes' effect on terrorist tactical diversity can illuminate the often-ignored causal pathways between drone strikes and terrorist organization activity. Tactical diversity is also a strong indicator of organizational capacity and, potentially, professionalism.[7] Understanding the relationship between drone strikes and a terrorist organization's tactical diversity can help explain *why* and *how* drone strikes succeed or fail, which is a knowledge base the literature is lacking.

To contribute to the literature, I will employ a mixed methods approach. The first phase of the thesis, a quantitative assessment of the relationship between drone strikes and terrorist

[5] Horowitz, Michael C., Evan Perkoski, and Philip B.K. Potter. "Tactical Diversity in Militant Violence." *International Organization* 72, no. 1 (2018): 139–71. https://doi.org/10.1017/S0020818317000467., p. 140.
[6] Johnston, Patrick B., and Anoop K. Sarbahi. "The Impact of US Drone Strikes on Terrorism in Pakistan." *International Studies Quarterly* 60, no. 2 (June 2016): 203–19. https://doi.org/10.1093/isq/sqv004., p. 206.
[7] Horowitz, Perkoski, and Potter, 2018, p. 140-141.

organization tactical diversity, will use a unique large-N dataset to provide insights on overarching trends in terrorist organizations' reactions to a drone campaign. The second phase will be a case study of Yemen's Al Qaeda in the Arabian Peninsula in 2012. The qualitative exploration will search for drone strikes' impact on a group's leadership structure, use of discriminate and indiscriminate violence, and overarching insurgency strategy. Hopefully, the insights from the case study will contextualize the empirics from the quantitative regressions, expose a potentially omitted variable, and highlight the applicability of this thesis's findings to policymakers.

My findings indicate that drone strikes can increase both the number of tactics a terrorist organization employs and the number of different targets they attack in a given year. Drone strikes are associated with a terrorist organization's tactical diversification, and this effect is largely driven by two factors: leadership decisions to manage risk and incentives to improve a group's strategic position in conflicts against local governments. As a terrorist group becomes afflicted by a sustained drone campaign and their losses mount over time, their tactical diversity will probably decrease so long as governments can maintain effective control over territories. Drones can debilitate terrorist organizations, but these organizations can adapt effectively if there is not a ground presence to remove their grasp over the local populace. Drones can decrease tactical diversity and be considered effective under limited conditions, which are determined by local state capacity and legitimacy.

Chapter 1

Background

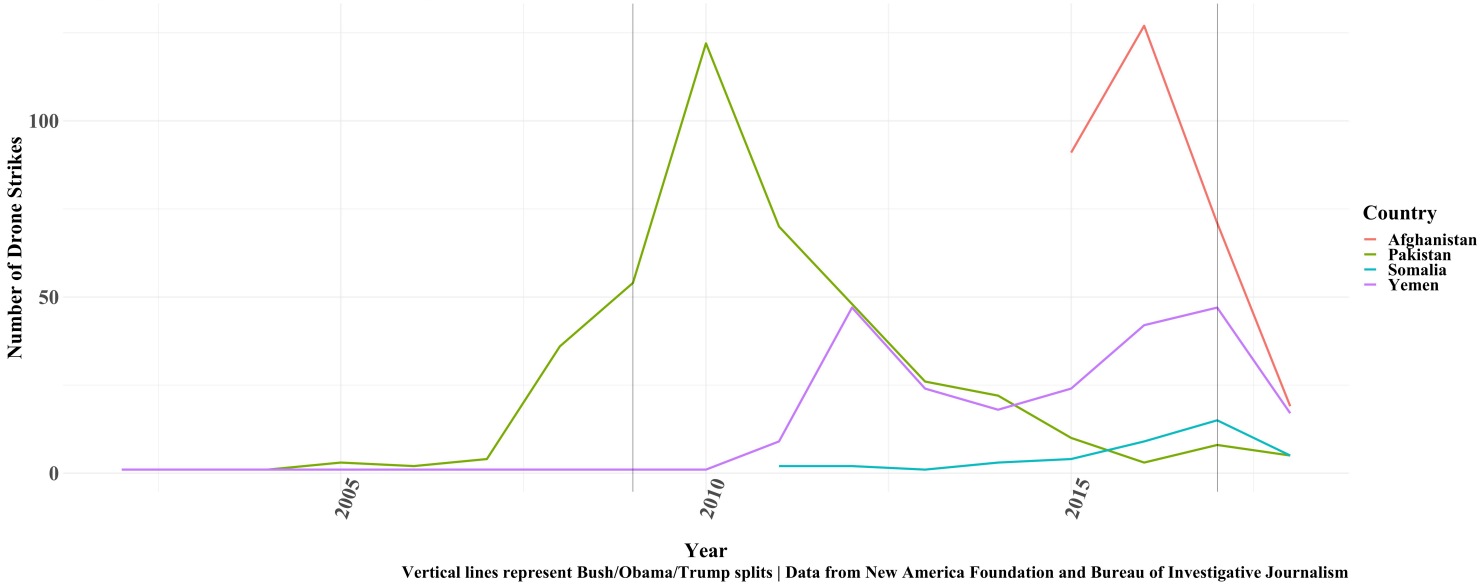
Towards the end of the Reagan administration, drone technology emerged. By the Gulf Wars, the U.S. military had acquired Unmanned Arial Vehicle (UAV) surveillance technology.[8] UAVs were used quite extensively during the Gulf War — reportedly, the U.S. would have at least one UAV in the air at all times — and the CIA decided to purchase five Gnat drones to track troop movements in the Balkan wars.[9] These Gnat drones were the early prototype to the Pentagon's predator drones, the first to be equipped with missile capability.[10]

Al-Qaeda's acts of terrorism on September 11, 2001 transformed U.S. foreign policy, instituting the "War on Terror" and providing the political capital to pass major legislation expanding the war powers of the Presidency. The USA PATRIOT Act and the Authorization of Military Force (AUMF) expanded presidential war powers such that sustained drone campaigns across the globe could find legal backing without additional support from Congress.[11] The Bush and Obama administrations relied heavily on the AUMF for legal support, using its language and that of the NSDD 138 — the original document backing the use lethal force against terrorist organizations — in legal white papers.[12] The legal memos produced in the aftermath of 9/11 would define counter-terrorism as the highest national security priority in the nation, referencing domestic legislation and the new classification of terrorists as "unlawful combatants" to legally justify the country's new policy positions.[13] Though counter-terrorism had become an

[8] Warrell, Helen. "From Desert Storm to Soleimani: How US Drone Warfare Has Evolved," *Financial Times*, January 9, 2020, https://www.ft.com/content/6346dd78-322d-11ea-9703-eea0cae3f0de.
[9] ibid.
[10] ibid.
[11] Fuller, Christopher. "The Eagle Comes Home to Roost: The Historical Origins of the CIA's Lethal Drone Programme" (Ph.D., England, University of Southampton (United Kingdom), 2014), https://search.proquest.com/docview/1783893458?pq-origsite=primo/ip., p. 60.
[12] ibid., p. 60.
[13] ibid., p. 147.

increasingly important part of presidential foreign policy agendas since the Reagan years, the Bush administration marked the first time when combatting terrorism abroad was the security priority.

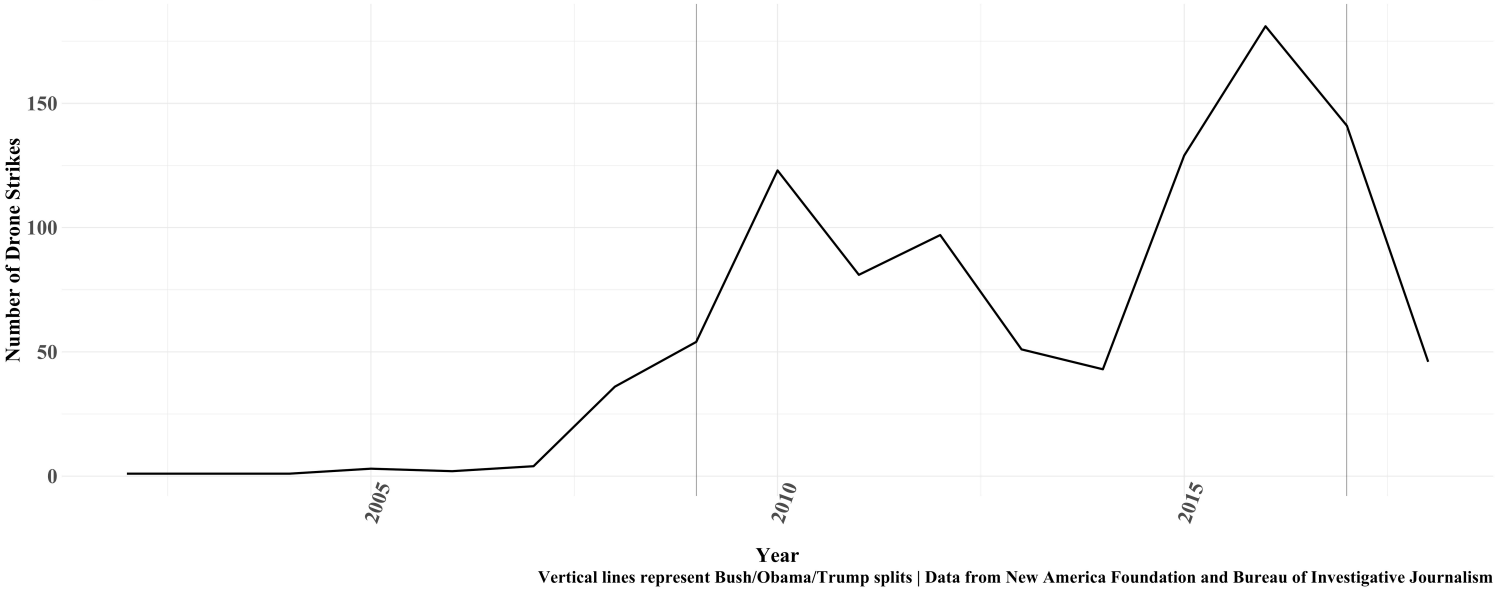
Figure 1.1: Drone Strikes by Country



In 2001, the U.S. military managed to adapt the Gnat UAV to a predator drone with missile capabilities.[14] The new military tool was tested in an attempted strike against Mullah Mohammed Omar, the Taliban's supreme leader, but the drone fired prematurely, missing the target and hitting a nearby truck.[15] As this first attempt was a failure, the Bush administration would make limited use of drone strikes over remainder of his term. Only during his second term would President Bush begin to consistently use drones in a counter-terror campaign. President Bush exited his presidency having executed 57 drone strikes in Yemen, Afghanistan, and Pakistan.

[14] Warrell, 2020.
[15] ibid.

Figure 1.2: Drone Strikes Over Time



The Obama administration, relying on the more advanced MQ1B Predator and MQ-9 A/B Reaper, would launch a total of 564 drone strikes by the end of his presidency.[16] The increase in the drone program's usage under President Obama — shown in Figure 1.2 — prompted intense media coverage of the issue.[17] The increase also required the Obama administration to produce more white papers justifying the program's frequency and defining the its goals. In a 2011 report, the Obama Administration argued the U.S. must uphold the nation's core values of respecting human rights and upholding the rule of law while using counter-terrorism tools, including drones, to reduce the threat terrorism poses to U.S. citizens.[18]

The report provides more detail on how the administration planned to reduce the threat of overseas terrorists: the U.S. planned to disrupt and degrade Al-Qaeda and their affiliates, prevent the acquisition of weapons of mass destruction by terrorists, deprive terrorists of their financial

[16] Warrell, 2020.
[17] Fuller, 2014, p. 2.
[18] "National Strategy for Counterterrorism" (The White House, June 2011), https://obamawhitehouse.archives.gov/sites/default/files/counterterrorism_strategy.pdf., p. 4-5

backers, eliminate safe havens, and counter the extremist ideology.[19] These are fairly standard goals, and a drone campaign operates in pursuit of them. Mainly, drone strikes were used by the Obama administration to disrupt and degrade Al-Qaeda, eliminating high-value individuals (HVIs) in the hopes that their absence removes a locus of knowledge and experience from the organization. While other counter-terrorism operations, such as troop training or foreign aid, may advance more than one of the nation's counter-terrorism goals, drone strikes are limited to accomplishing the single goal of combatting terrorists. However, drone strikes — through their many civilian casualties — may inadvertently undermine the United States' core values in advancing human rights and protecting international law. [20]

These debates continue under the Trump Presidency, which has outpaced the Obama administration's drone strike usage throughout its first two years.[21] President Trump has even dismantled some Obama-era policies limiting the use of drone strikes, removing many requirements that governed the use of drones in non-combat areas like Libya and Somalia while deputizing the "go" order for a strike to military commanders.[22] Current rules allow the Department of Defense to execute strikes overseas without White House approval. The Trump Administration demarcates a new era in U.S. counter-terrorism operations. ISIS has replaced Al-Qaeda as the chief terror concern, and counter-terrorism is no longer the top security priority.[23] As the threats of China and Russia begin to take foreign policy priority, counter-terrorism decisions are placed in unelected hands, only reaffirming the need for public and academic scrutiny of the drone program.

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[19] Ibid., p. 5-7.
[20] Boyle, Michael J. "The Costs and Consequences of Drone Warfare." *International Affairs* 89, no. 1 (January 2013): 1–29. https://doi.org/10.1111/1468-2346.12002., p. 1-2.
[21] Warrell, 2020
[22] Schulman, Loren DeJonge, and Daniel J. Rosenthal. "Trump's Secret War on Terror." *The Atlantic*, August 10, 2018. https://www.theatlantic.com/international/archive/2018/08/trump-war-terror-drones/567218/.
[23] Cancian, 2019

Chapter 2

Review of Relevant Literature

Prior literature falls into three distinct but interrelated categories: drone strikes, targeted killings, and leadership decapitation. “Targeted killings” is the broadest term, possibly encompassing the other two. Drone strikes, for instance, are a form of targeted killings. Drone strikes can also be used as a tool in a leadership decapitation counter-terrorism strategy. Leadership decapitation too is a form of targeted killings. The relationship between these three terms and their use in the literature demands attention.

Targeted killings is the catch-all term for operations against a specific individual or military target, such as a building, compound, or camp. Attacks against military targets set targeted killings apart from leadership decapitation strategies. Targeted killings can be conducted by drone strikes or other tools, including special forces operations — like the one that killed Osama bin Laden — airstrikes, and cruise missile strikes. Targeted killing literature is very similar to drone strike literature, and the two groups are often lumped together. The uniqueness of drone strikes warrants their separate consideration, however.

Drone strikes are projectile strikes from UAVs that can fly for days at a time, waiting for the proper moment, weather, and civilian conditions to strike. This imparts uniqueness to the drone program. Prior research has stressed the disruption that constant surveillance and threats of force from an ever-present drone have on terrorist and civilian livelihoods. Drone critics claim the psychological trauma of living under drones extends to civilian communities as well. The fear of incidentally associating with terrorists drives away humanitarian workers, deters political and social group meetings, and possibly prevents parents from sending their kids to school.

However, the findings from Shah's field work in the FATA region do not support the claim that civilians experience psychological trauma.[24] The study's interviews of residents in Pakistan's tribal region, the most active drone theater, indicates that civilians take a more practical approach to the presence of drones, understanding drone operations as necessary to curtail the coercive and harsh militant rule in the area.[25] Pakistanis noted in their interviews that drones indeed forced terrorist organizations to limit movements and communication.[26] Terrorists were devoting more time to survival rather than planning attacks.[27] Captured documents indicate that Al-Qaeda in Iraq leaders routinely lamented their inability to establish camps or make a broad call-to-arms in the insecure Iraqi geography that lacked the mountains and caves capable of offering safety from drones.[28] Whether the proponents or critics of drones are correct, a sustained drone campaign can affect terrorist organizations by either instilling a fear of constant surveillance or by alienating the local populous and providing terrorists with a new pool of recruits. These facets of a drone campaign warrant its classification as a subset of the targeted killings literature that deserves independent analysis.

Targeted killing and drone strike literature are often grouped or, at the very least, put in close conversation with each other. One of the earliest pieces on targeted killings studied Israel's program to contextualize the possibilities for the nascent U.S. drone program.[29] Byman's *Foreign Affairs* piece established the effectiveness of Israel's targeted killing program, highlighting the relationship between targeted killings and the decrease in lethality from Hamas

[24] International Human Rights and Conflict Resolution Clinic (Stanford Law School), and Global Justice Clinic (NYU School of Law). "Living Under Drones: Death, Injury, and Trauma to Civilians From US Drone Practices in Pakistan," September 2012. https://doi.org/10.1163/2468-1733_shafr_SIM260090013.
[25] Shah, Aqil. "Do U.S. Drone Strikes Cause Blowback? Evidence from Pakistan and Beyond," *International Security* 42, no. 04 (May 1, 2018): 47–84, https://doi.org/10.1162/isec_a_00312., p. 59-60.
[26] ibid., p. 56-57.
[27] ibid., p. 56.
[28] Wilner Alex S., "Targeted Killings in Afghanistan: Measuring Coercion and Deterrence in Counterterrorism and Counterinsurgency," *Studies in Conflict & Terrorism* 33, no. 4 (March 15, 2010): 307–29, https://doi.org/10.1080/10576100903582543., p. 312.
[29] Byman, Daniel. "Do Targeted Killings Work?" *Foreign Affairs* 85, no. 2 (2006): 95. https://doi.org/10.2307/20031914.

attacks. Byman later followed his article with another work in *Foreign Affairs* supporting drone strikes.[30]

Yet, the early literature on the drone program lacked quantitative input; most work — whether for or against the use of drone strikes — was grounded in prior leadership decapitation scholarship, small-N case-studies, the moral concerns of extrajudicial killings and civilian casualties, or the legality of the program.[31]

Drone strikes, more so than other counter-terrorism measures, have long been criticized as a form of illegal, extrajudicial killings, which undermine the rule of law and devalue human life.[32] Civilian casualties are a practical challenge for drone strikes — civilian casualties can undermine the "hearts-and-minds" strategy of counter-terrorism — but they also pose a *prima facie* moral dilemma to those who evaluate the program holistically. The loss of human life can entirely outweigh the value created by destabilizing terrorist organizations. Supporting these arguments is the lack of transparency in government reporting of civilian deaths. Past administrations have obscured civilian casualty counts with their vague definitions: some claim the term "militants," which measures terrorist casualties as opposed to civilian casualties, is purposefully broad, allowing the government to underreport the number of civilians killed in strikes.[33] The released government data on the drone program is scant, and the Trump administration has even taken steps to further limit the release of drone strike information.[34]

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[30] Byman, July/August 2013.
[31] Olney, Luke A. "Lethal Targeting Abroad: Exploring Long-Term Effectiveness of Armed Drone Strikes in Overseas Contingency Operations." Master's Thesis, Georgetown University, 2011.; Staeheli, Paul W. "Collapsing Insurgent Organizations Through Leadership Decapitation: A Comparison of Targeted Killing and Targeted Incarceration in Insurgent Organizations." Naval Postgraduate School, 2010.; Boyle, Michael J. "The Costs and Consequences of Drone Warfare." *International Affairs* 89, no. 1 (January 2013): 1–29. https://doi.org/10.1111/1468-2346.12002.
[32] Boyle, Michael J, 2013, p. 1-2.
[33] Grut, Chantal. "Counting Drone Strike Deaths." Human Rights Clinic at Columbia Law School, October 2012. https://www.law.columbia.edu/sites/default/files/microsites/human-rights-institute/files/COLUMBIACountingDronesFinal.pdf.
[34] Talev, Margaret. "Trump Cancels Rule Requiring U.S. to Report Civilians Killed in Drone Strikes." *Time*, March 6, 2019. https://time.com/5546366/trump-cancels-drone-strike-rule/.

Proponents, on the other hand, argue drones are the best option to combat the threat of terrorism. This argument proceeds from the assumption that terrorism will be fought by the United States, and, given this base assumption, drones are preferable to the primary alternatives.[35] Compared to troop invasions and normal airstrikes, drones minimize the total number of casualties because they limit both U.S. casualties and civilian casualties by eliminating the need for American troop deployments and using more precise targeting technologies than guided missiles or airstrikes.[36] Despite the data supporting this position, civilian casualties would still be significantly limited if the U.S. fought terrorism with non-violent instruments of national power, including diplomacy, foreign aid, and nation building.

The ethical problems of civilian casualties are an additional concern to drone strikes' legal murkiness. The drone program has relied on re-interpretations of U.N. Charters and international law to justify its actions.[37] In some cases, secret agreements between the United States and host countries were reached to provide the U.S. with the authority to operate drones.[38] Critics often question, how can the U.S. government — a "City upon a Hill" to guide the world — claim its actions to be successful when they undermine many of the foundational principles of the rule of law?

Such legal challenges to the drone program lack substantive responses from drone proponents but are instead combatted with references to the effectiveness and necessity of the policy. In some cases, drone proponents argue international law's weak enforcement

[35] Statman, Daniel. "Drones and Robots: On the Changing Practice of Warfare," in *The Oxford Handbook of Ethics of War*, ed. Seth Lazar and Helen Frowe, vol. 1 (Oxford University Press, 2015), https://doi.org/10.1093/oxfordhb/9780199943418.013.9., p. 3.
[36] ibid. p, 4.; James Igoe Walsh, "The Effectiveness of Drone Strikes in Counterinsurgency and Counterterrorism Campaigns," Strategic Studies Institute (United States Army War College Press, September 2013)., p. 19.
[37] Brooks, Rosa. "Drones and the International Rule of Law." *Ethics & International Affairs* 28, no. 1 (ed 2014): 83–103. https://doi.org/10.1017/S0892679414000070., p. 93-94.
[38] Miller, Greg, and Bob Woodward. "Secret Memos Reveal Explicit Nature of U.S., Pakistan Agreement on Drones." *Washington Post*, October 24, 2013, sec. National Security. https://www.washingtonpost.com/world/national-security/top-pakistani-leaders-secretly-backed-cia-drone-campaign-secret-documents-show/2013/10/23/15e6b0d8-3beb-11e3-b6a9-da62c264f40e_story.html.

mechanisms render the point mute: The United States can assert its right to target top terrorist overseas through the legitimacy of its domestic legislation, which affirms the legality of drone strikes.[39]

These moral and legal arguments filled much of the drone literature before data on drone strikes became widely available. Though important to a full-scale analysis of the drone program, published pieces centered on such topics are less common now, as present research has focused more on the quantitative relationship between drones and metrics commonly used to measure the program's success than the moral and ethical concerns of the policy.

Quantitative drone strike literature did not proliferate until the mid-2010s. Early quantitative literature in this area studied targeted killings as a whole. A *Los Angeles Times* article cites Rex Rivolo, an analyst in the U.S. Baghdad office, who presented evidence to his superiors that the U.S. targeted killing strategy was associated with an increase in terrorist IED attacks.[40] Moorehouse similarly finds that U.S. targeted killings are associated with an increase in the frequency and lethality of terrorist attacks.[41] More recent work on U.S. airstrikes finds that they are associated with an increase in attacks and lethality as well.[42] Quantitative targeted killing literature often finds targeted killings incite more terrorist violence.

Drone literature presents more varying results, however. Johnston and Sarbahi studied drone strikes in Pakistan's FATA region from 2007–2011, associating drone strikes with a decrease in the frequency and lethality of terrorist attacks in the week following a strike.[43]

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[39] Byman, Daniel. "Why Drones Work." *Foreign Affairs* 92, no. 4 (August 2013). https://www.foreignaffairs.com/articles/somalia/2013-06-11/why-drones-work.
[40] Cockburn, Andrew. "Assassination Backlash." *L.A. Times*, November 3, 2011. http://articles.latimes.com/2011/nov/03/opinion/la-oe-cockburn-assassination-20111103.
[41] Morehouse, Matthew A. "Hellfire and Grey Drones: An Empirical Examination of the Effectiveness of Targeted Killings." Master's Thesis, University of Nebraska - Lincoln, 2011.
[42] Lyall, Jason. "Bombing to Lose? Airpower, Civilian Casualties, and the Dynamics of Violence in Counterinsurgency Wars." SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, September 3, 2017. https://papers.ssrn.com/abstract=2422170.
[43] Johnston and Sarbahi, 2016, p. 203

Additionally, they present evidence that the decrease is not the result of displacement; that is, terrorists do not appear to simply move their activities away from the region that was targeted. The decrease in activity and lethality is real. Johnston and Sabarhi also use high-value individual kills by drone strikes as an independent variable, finding similar results to their initial tests.

Recent work has found mixed results.[44] Drone strikes, depending on the time frame and country studied, can be effective or ineffective. Drone strikes do not appear to have a long-term effect on terrorist organizations, and their success can be dependent upon the country or organization targeted.

This is a space wherein the literature can improve. The varying security situations across target countries play large roles in defining the success of a campaign, but many quantitative studies lack robust controls for such factors. Johnston and Sabarhi, for instance, detail the qualitative differences between the administrative agencies in Pakistan and the terrorist groups that operate throughout the country.[45] There is an understanding that administrative and group-level conditions may influence the outcome of a drone campaign. Yet, their analysis used a fixed-effect method to only account for differences across Pakistan's administrative districts. It lacks controls for group-level variables that might determine an organization's resilience to drone strikes. Though accounting for security situations across Pakistan's administrative agencies over time may begin to untangle the web of confounders that impact a drone campaign's success, a more detailed accounting of those factors through control variables could

[44] Zimmerman, Madeline. "The Effect of U.S. Drone Strikes on Terrorism in Pakistan and Yemen." The National Bureau of Economic Research, 2017. http://conference.nber.org/conf_papers/f91634.pdf.; Watts, Stephen, Patrick Johnston, Jennifer Kavanagh, Sean Zeigler, Bryan Frederick, Trevor Johnston, Karl Mueller, et al. *Limited Intervention: Evaluating the Effectiveness of Limited Stabilization, Limited Strike, and Containment Operations*. RAND Corporation, 2017. https://doi.org/10.7249/RR2037.; Jaeger, David A., and Zahra Siddique. "Are Drone Strikes Effective in Afghanistan and Pakistan? On the Dynamics of Violence between the United States and the Taliban." *CESifo Economic Studies* 64, no. 4 (December 1, 2018): 667–97. https://doi.org/10.1093/cesifo/ify011.

[45] Johnston and Sarbahi, 2016, p. 204-208

help produce more accurate results or, at the very least, provide additional evidence in support of their findings.

The success of drone strikes is unclear, but it is clear that drone strikes affect terrorist organizations. Drone strikes should be evaluated in the context of a country's security situation and the United States' counter-terrorism tactics that simultaneously complement drone strikes.[46] Such controls would improve the actionable information available for use by counter-terrorists and policymakers.

Leadership decapitation refers strictly to the elimination of an HVI from a terrorist organization. Leadership decapitation campaigns can be conducted with drone strikes, cruise missile strikes, airstrikes, or special forces operations. This literature is often set apart from drone and targeted killing literature since drone strikes and targeted killings need not always eliminate HVIs. Academic work studying leadership decapitation has a heavier focus on organizational theory and the mortality of terrorist organizations than drone or targeted killing works do. Prior academic work studying leadership decapitation has largely analyzed the effect of a leader's death on the organization's lifespan. There is not a clear consensus in the literature.

Arguably the most prominent piece of work on the topic found that leadership decapitation is ineffective. Organizations that experienced leadership decapitation last longer than those that had not experienced decapitation, and the strategy may be counterproductive when used against older, religious organizations.[47] Unfortunately, methodological flaws in Jordan's work may limit the applicability of her findings. The results are questionable for two reasons. First, there is a large selection bias — though this may be said about much of the

[46] Guerra, 2017
[47] Jordan, Jenna. "When Heads Roll: Assessing the Effectiveness of Leadership Decapitation." *Security Studies* 18, no. 4 (December 2, 2009): 719–55. https://doi.org/10.1080/09636410903369068.

leadership decapitation literature — because decapitation campaigns are more likely to target groups that pose a larger threat. Often, the factors that make a group a large threat — large membership base, strong organizational features — make them resistant to leadership decapitation strategies. Jordan does not account for this. Second, Jordan makes several large assumptions. She uses an organization's age as a proxy for its size, arguing that older groups are likely larger. There is no empirical basis in her research for the leap. She also assumes that the ideology of an organization is a solid proxy for its leadership structure. This assumption also has a little empirical basis. Later work attempted to build upon Jordan's heavily cited analysis.

Johnston employs a different dependent variable, war/conflict termination, which he thought more appropriately captured the end-goal of leadership decapitation strategies. Even if an organization did not collapse, leadership decapitation could still be considered successful if the conflict was resolved in the government's favor. Johnston's work attempts to address several of the concerns raised about Jordan's studies, analyzing a large number of cases where governments successfully and unsuccessfully attempted to decapitate terrorist organizations.[48] He found that leadership decapitation decreases the lethality and frequency of terrorist attacks and increases the chance of war termination and government victory. Price's approach to leadership decapitation is similar to that of Jordan's: his dependent variable is the mortality of terrorist organizations.[49] He concludes that leadership decapitation does increase the mortality of terrorist organizations, implying that decapitation is an effective counter-insurgency strategy.

Unlike Johnston, Price develops a theoretical underpinning for his argument, claiming that the clandestine nature of terrorist organizations makes them more reliant upon their leaders.

[48] Johnston, Patrick B. "Does Decapitation Work? Assessing the Effectiveness of Leadership Targeting in Counterinsurgency Campaigns." *International Security* 36, no. 4 (April 1, 2012): 47–79. https://doi.org/10.1162/ISEC_a_00076.
[49] Price, Bryan C. "Targeting Top Terrorists: How Leadership Decapitation Contributes to Counterterrorism." *International Security* 36, no. 4 (April 5, 2012): 9–46.

Additionally, organizations reliant upon their ideology for group cohesion may have their charismatic leader central to constructing the ideology. Should the leader perish, the ideology and, thus, the organization may follow. Jordan's review of Price and Johnston's work praises them as "two of the most sophisticated works on leadership targeting to date. The breadth of their data is unparalleled."[50]

Though the strength of Price and Johnston's scholarship may seem to establish a consensus in the literature, further mixed-method work unearthed an important finding obscured by the prior large-N studies. Mitakides's work uses a case-study of the Muslim Brotherhood to inform the work's regression analyses.[51] Mitakides finds that leadership structure is critical to the resilience of a group in the face of leadership decapitation campaigns, a factor understood by past work but not properly accounted for by its regressions or case studies. She concludes that organizations with strong, formalized institutions are quite resilient to leadership decapitation. For example, a group with an unambiguous chain of command and succession strategy is likely to survive several decapitations. Without adapting to the internal characteristics of a given group, leadership decapitation is likely a misguided strategy. Targeting a group's social services, which helps generate a terrorist's financial and human capital base, would be a more effective strategy. The prior leadership decapitation literature is built on robust quantitative work and a budding theoretical basis.

My work will address a dependent variable that has not been analyzed with drone strikes as the independent variable: the tactical diversity of terrorist organizations. The prior literature has attempted to understand the relationship between drone strikes and aggregate terrorist

[50] Jordan, Jenna. "Article Review 15 on 'Does Decapitation Work?' And 'Targeting Top Terrorists.'" H-Diplo | ISSF, October 24, 2012. https://issforum.org/articlereviews/15-does-decapitation-work.
[51] Mitakides, Katherine Wynn. "Stayin' Alive: A Mixed-Methods Study of the Inconsistent Effects of Leadership Decapitation on Terrorist Organizations." Miami University, 2017.

activity, but they have not asked *how* terrorist activity is affected. By analyzing the types of attacks conducted by terrorist organizations, we can understand how terrorist organizations increase or decrease their attack frequency and lethality.

Prior work on tactical diversity has successfully shown that counter-terrorism conditions, as measured by the Physical Integrity Index, can affect a terrorist organization's tactical diversity.[52] Horowitz and his co-authors use the Physical Integrity Index as a measure for the strength of a government's crackdown on terrorism. Their work is similar to that of prior drone, targeted killing, and leadership decapitation literature: they attempt to understand the effect of a counter-terrorism metric on a terrorist organization's activities. Horowitz and his co-authors differ not only in the specifics of their independent and dependent variable, though. Their OLS regressions make use of specific terrorist group and country-level controls that are often excluded from regressions in drone studies. Per capita GDP, infant mortality, and a group's organizational structure are just a few of the variables that they believe confound the casual mechanisms connecting their independent and dependent variables.[53] Their findings suggest terrorist groups diversify their tactics in the face of stronger counter-terrorism measures because diversification mitigates risk and can force a group's opposition to overextend scarce resources.

My thesis will largely resemble the paper's methodologies, but my independent variable will be the number of drone strikes in a given year. The literature presented in this chapter heavily influenced the theoretical arguments made in construction of my hypotheses and the statistical techniques employed to model the relationship between a drone campaign and a terrorist organization's tactical diversity. The following chapters will outline my hypotheses and the statistical techniques I use to test them.

[52] Horowitz, Perkoski, and Potter, 2018, p. 153.
[53] Ibid., p. 164

Chapter 3

Hypotheses

The hypotheses in this chapter are built from the assumption that terrorists and their organizations act rationally. By acting rationally, I mean individuals and organizations will act in ways that advance their respective goals. One caveat must be addressed, though. Knowing that a person or organization acts rationally does not provide any information about what their respective goals will be. A goal does not need to be considered ethical to be rational. Scholars who critique such definitions of rationality argue that it may be impossible to truly understand a person's goals, and, therefore, it may be impossible to understand if people are acting rationally.[54] This is a valid concern, but, for the purposes of these hypotheses, there is enough evidence to believe that terrorists and terrorist organization act rationally.

Though it may seem counter-intuitive, assumptions of rationality are made in much of the terrorism literature.[55] Suicide terrorism, for instance, might seem irrational because a terrorist sacrifices his or her life and an organization loses a devoted member. However, there is a strategic logic to suicide attacks — the immense damage inflicted on the terrorist organization's opponents can leverage favorable outcomes — that guides each organization's use of the tactic.[56] Individual behavior becomes rational as each suicide terrorist adopts the organization's goals as their own, calculating the risks and costs, including their own life, as necessary to achieve their goals and the goals of the group. Interview-based studies of terrorists support this claim,

[54] Yee, Albert S. "Thick Rationality and the Missing 'Brute Fact': The Limits of Rationalist Incorporations of Norms and Ideas." *The Journal of Politics* 59, no. 4 (1997): 1001–39. https://doi.org/10.2307/2998589., p. 1003.
[55] Mitakides, Katherine Wynn, 2017, p. 14
[56] Pape, Robert Anthony. *Dying To Win: The Strategic Logic of Suicide Terrorism*. Random House Trade Paperback ed. New York: Random House Trade Paperbacks, 2006., p. 347.

"presenting evidence that individuals identify the group's goals as their own; thus, seemingly irrational individual actions that benefit the group can be considered rational."[57]

Even if some terrorist organizations act irrationally, those irrational organizations are less likely to be targeted by drone strikes and, therefore, less likely to be the subjects of this thesis. A rational group that opposes the U.S. will consistently make the decisions that improve their ability to combat the United States. Irrational organizations will not consistently take steps that threaten U.S. interests because they either lack a coherent goal that conflicts with those of the U.S. or act in a manner inconsistent with their goals. All else equal, the organization that consistently acts to undermine the U.S. is more likely a threat than the irrational organization that does not. Though it is possible an irrational organization threatens the U.S. and is subsequently targeted by a drone strike, the probability appears low.[58] Therefore, the hypotheses in this chapter will assume that organizations targeted by drone strikes will react to their new threat rationally.

H1a: The number of drone strikes an organization experiences has a positive effect on the number of different tactics employed by that organization.

For illegal or clandestine groups, their organizational structure is driven primarily by the desire to operate undetected by governments or regulating authorities; that is, illegal organizations, such as terrorist organizations, exhibit risk management behaviors that respond to pressure from governments, and, in some cases, respond to sufficient pressure by minimizing

[57] Mitakides, Katherine Wynn, 2017, p. 15-16
[58] Abrahms, Max. "What Terrorists Really Want: Terrorist Motives and Counterterrorism Strategy." *International Security* 32, no. 4 (2008): 78–105., p. 102

efficiency for the sake of concealment.[59] This research indicates that terrorist organizations will likely undertake strategies that minimize the risk their organizations die from government action.

Tactical diversity is a strategic move that tracks with terrorist organizations' risk management strategy. Diversification is a common risk management tool for economic firms, and the similar logic that drives business diversification guides terrorist organizations as well. As economic firms attempt to limit their exposure to a downturn in one market, terrorist organizations can diversify to decrease the odds that the collapse of one branch dooms their organization completely. Additionally, diversification provides flexibility. Should the government increase security funding or make a technological leap that limits the effectiveness of an organization's tactic(s), the terrorists will still have ample ability to conduct their operations. Finally, an advanced repertoire of tools can increase an organization's unpredictability. Governments may feel the need to prepare for any and all possible terrorist attacks, overstretching their defensive resources and limiting their capacity to incapacitate terrorist organizations. Though tactical diversity could overextend terrorist organizations in the same manner that it would force government forces to overstretch, the benefits of diversification suggests that terrorist organizations will diversify in the face of government counter-terror measures.

Prior research highlights this effect, and I expect my mixed-method approach to reaffirm — through the independent variable of drone strikes — the positive effect of counter-terror measures on terrorist organization tactical diversity.[60]

[59] Kilberg, Joshua. "A Basic Model Explaining Terrorist Group Organizational Structure." *Studies in Conflict & Terrorism* 35, no. 11 (November 1, 2012): 810–30. https://doi.org/10.1080/1057610X.2012.720240., p. 811-812
[60] Horowitz, Perkoski, and Potter, 2018, p. 153.

H1b: Drone strikes will have a positive effect on terrorist organization tactical diversity that will not extend beyond the given observation year.

There is an important question of timeframe for this study: how long will it take for terrorist organizations to build the internal frameworks necessary for tactical diversification?

Drone literature resoundingly confirms the short-term effect of drones on terrorist activity or attack lethality; often, the relationship lacks statistical significance, whether positive or negative, past a few months.[61] Terrorist organizations, which may already possess the technical knowledge to conduct the most complicated and lethal types of attacks, possibly only require the external pressure to motivate diversification. Given this possibility and the findings of prior research, there is limited indication that the relationship between the two variables will require more than a year to materialize.

I expect the effect on tactical diversity not to extend beyond the given observation year and will test this expectation through separate models with a year lag on the independent variable.

H2: The cumulative number of drone strikes experienced by a terrorist organization will have a negative effect on that organization's tactical diversity.

There may be heterogeneous treatment effects; that is, the impact of each drone strike on a terrorist organization will not be the same. A robust drone campaign — one that has eliminated enough members and leaders from the target terrorist organization such that they can no longer withstand subsequent losses — will likely debilitate the organization. Drone strikes may instigate

[61] Johnston and Sarbahi, 2016; Watts et al., 2017

terrorists' tactical diversification at first, but, once they begin to feel significant pressure, drone strikes may decrease the number of tactics a terrorist organization employs in a given year.

Leadership decapitation is the primary mechanism by which drone strikes will degrade a terrorist organization's capacity. Drone strikes often target leaders, and leadership decapitation literature overwhelmingly underscores the debilitative effect the strategy has on terrorist organization capacity and mortality. There is a robust logic behind this empirically backed position.

First, eliminating an insurgent leader destroys the locus of knowledge in the organization. Terrorist organizations are likely to be reliant upon their leaders because an institutionalized knowledge base could allow for internal coups or information leaks to counter-terrorists.[62] Information about operational logistics, resources, and financing are possibly lost when a leader is killed. New leaders may lack the necessary rapport to maintain relationships with terrorist or government allies. When mid-level members are killed, their tactical expertise and experience is lost. Even if there are suitable replacements, experience is lost, and, sometimes, that experience is vital to the success of operations.

Second, removing leaders can demoralize members. This effect is magnified in organizations reliant upon charismatic leaders. Where a group is formed upon an individual's leadership and ideology, the desire for followers to risk their lives in the name of their leader and his cause may dissipate. When a leader dies, the next-man-up may fear the risks of assuming his new position, a position that lead to the death of his predecessor. Such was the case for Mullah Mansoor Dadullah, who was chosen to lead the Afghan Taliban after his brother was killed in a targeted strike. Mansoor was ultimately removed from his position. Taliban statements spun

[62] Price, 2012, p. 17.

Mansoor's removal as a consequence of behavior inconsistent with the rules of the Islamic emirate of Afghanistan. [63] The Taliban's statements suggest that the group was struggling to find a suitable replacement for their lost leader, and some within the organization suffered a lack of morale and conviction in the aftermath of their leader's death.

As discussed in the previous chapter, an organization's leadership structure can immunize their group from the effects of repeated terrorist attacks. Diversification can help organizations survive campaigns as well. Yet, the empirical findings in the literature suggest that the protective effect of an institutionalized structure can break down over time.[64]

The empirical results of prior literature and the logic behind the debilitative effect of targeted killing campaigns, especially ones that consistently targets upper-echelon leaders, lead me to believe that a sustained drone campaign will have a negative effect on a terrorist group's tactical diversity, as the group will lack the capabilities to maintain a diverse activity portfolio.

To scrutinize this hypothesis, I will subset the data by selecting terrorist organizations that have experienced more than 25 drone strikes since they first became active.

H3: The number of drone strikes conducted against a terrorist organization will be positively associated with the number of target types attacked by that organization.

Terrorist organizations have plenty of incentives to respond to targeted killings. Decreases in activity following drone strikes would signal information about the organization's pain tolerance and persistence. There may not be an attrition effect until the organization is completely incapable of conducting terrorist attacks. Drone strikes add an extra incentive

[63] Wilner, Alex S. "Targeted Killings in Afghanistan: Measuring Coercion and Deterrence in Counterterrorism and Counterinsurgency." *Studies in Conflict & Terrorism* 33, no. 4 (March 15, 2010): 307–29. https://doi.org/10.1080/10576100903582543., p. 322.
[64] Price, 2012, p. 24.

because they are noticeable to the civilian population. If the civilian population notices a decrease in violence following drone strikes, they could perceive the terrorist organization as weak and defect to the counter-terrorists, providing information and support. Even if terrorist groups are severely hindered by a drone campaign, their incentive to hide such a fact through consistent attacks would spur their actions.[65] These attacks will most likely target civilian populations and public goods in an attempt to strike fear into the hearts of potential defectors.

A drone campaign would increase the number of unique targets attacked in a given year because terrorist organizations attempt to limit their attacks on civilians — except where civilians overtly oppose their ideology, as is the case with Boko Haram's attacks on women's schools — when they are afforded the luxury of opportunities to maintain local support.[66] When local support begins to fade or counter-terrorists engage in violence against civilians, both of which can occur in a drone campaign, terrorist groups have the strategic incentive and/or the political cover to attack civilians.

Groups will begin to discriminately attack local leaders or public goods to impose a cost on citizens that defect to the counter-terrorists. Violence against specific targets can be a powerful tool in coercing civilians into silence and subjugation. Under severe duress, a terrorist organization may attack civilians indiscriminately to deter defections and, more importantly, impose a cost on the government. Terrorist groups will blame their deadly attacks on the government's affiliation with U.S. drones, attempting to associate the deaths from their attacks with government action. This strategy is a convoluted attempt to undermine local government authority, and it can indicate that an organization is becoming less of a threat.

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[65] Lyall, Jason. "Bombing to Lose? Airpower, Civilian Casualties, and the Dynamics of Violence in Counterinsurgency Wars." SSRN Scholarly Paper. Rochester, NY: Social Science Research Network, September 3, 2017. https://papers.ssrn.com/abstract=2422170., p. 4.
[66] Polo, Sara MT. "The Quality of Terrorist Violence: Explaining the Logic of Terrorist Target Choice." *Journal of Peace Research*, May 7, 2019, 0022343319829799. https://doi.org/10.1177/0022343319829799., p. 1.

In a drone campaign, it is likely that the strategic balance for terrorist organizations shifts, and violence against civilians and their public goods increases. Thus, the dependent variable should increase because terrorists add attacks against civilians, public goods, and religious targets to their tactical portfolio.

This hypothesis will be tested by changing the dependent variable from the type of attack conducted to the type of target attacked.

Chapter 4

Data and Methodology

Statistical Procedure

For the statistical approach, multiple ordinary least square (OLS) regression models were introduced with the two dependent variables, tactical diversity and target diversity, tested against the independent variable, the number of drone strikes in a given year. The four OLS models differ in their control variables. The number of control variables increases with each successive model. The first model includes only the independent variable. The second model includes the independent variable and the counter-terrorism control variables. The third model adds the country level controls to the second OLS, and the fourth model, which includes all control variables, adds the group level controls to the third model. This technique adds confidence to results that hold with each control group added. The progression can be seen below in Table 3.1.

Table 4.1: OLS Model Composition with Increasing Controls

Model 1	Model 2	Model 3	Model 4
Drone Strikes	Drone Strikes	Drone Strikes	Drone Strikes
	Counter-Terrorism	Counter-Terrorism	Counter-Terrorism
		Terrorist Group	Terrorist Group
			Country

Though statistically significant OLS models provide evidence of a relationship between the independent and dependent variables, they do not prove causation.[67] Several factors that limit

[67] Seawright, Jason. Multi-Method Social Science: Combining Qualitative and Quantitative Tools. Strategies for Social Inquiry. Cambridge University Press, 2016., p. 40.

the causal inference of an OLS regression, including reverse causality, endogeneity, and omitted variable bias. Reverse causality is one problem that challenges these regressions because, as mentioned previously, it is quite possible that terrorist organizations are targeted due to their tactical diversity. To address these concerns, several robustness checks are employed.

First, additional ordered logit regressions are used, replicating the OLS regressions. Ordered logit regressions are particularly suited for the dependent variable, which is scale of nine factors that increase in significance. These models treat the dependent variable as a "step in a step ladder." The probability that you reach the bottom or top of the ladder is dependent upon the step you are already occupying. Ordered logit models account for the likelihood that the dependent variable changes given the value of the dependent variable; that is, the model accounts for the fact that it may be easier to increase tactical diversity given a group with zero tactics employed than a group with four tactics employed. Ordered logit models have been shown to outperform OLS models when predicting future performance of an ordinal variable.[68] Their accuracy serves as a strong robustness check to confirm the initial OLS results.

As an important note, the ordered logit models were not used as the primary models for interpretability and versatility reasons. OLS models produce more easily interpretable result tables and predicted value plots, which will be shown in the following chapter.[69] Also, the number of observations in my dataset limits the ordered logit model's versatility. Trial and error in constructing the models for this thesis indicated ordered logits may not provide accurate results — if they provide results at all — when there is little variance in the dependent variable. With the current dataset, there was difficulty exploring subsets with ordered logits. Future

[68] Peel, Michael J., Mark M.H. Goode, and Luiz A. Moutinho. "Estimating Consumer Satisfaction: OLS Versus Ordered Probability Models." *International Journal of Commerce and Management* 8, no. 2 (January 1, 1998): 75–93. https://doi.org/10.1108/eb047369., p. 75
[69] Williams, Richard. "Understanding and Interpreting Generalized Ordered Logit Models." *The Journal of Mathematical Sociology* 40, no. 1 (January 2, 2016): 7–20. https://doi.org/10.1080/0022250X.2015.1112384., p. 7

research should attempt to build a more expansive dataset to enable an exhaustive line of inquiry using ordered logits.

Second, group and country level fixed-effects models were created to account for endogeneity issues arising from omitted variable bias. A fixed-effects model will approximate differences between country-time observations and their relationship to the dependent variable, calculating additional coefficients meant to proxy the latent difference between the observations. Simply, the fixed-effect models will attempt to solve problems that arise when drone strikes are correlated with something that may be missing from the model.

Independent Variables

The independent variable will be country-year-organization observations of drone strikes; that is, each observation will count the number of drone strikes conducted against terrorist groups in a certain year and country. The number of strikes in Yemen, Somalia, and Pakistan will be collected from the New America Foundation's (NAF) list of drone strikes.[70] The number of strikes in Afghanistan will be collected from the Bureau of Investigative Journalism's (BIJ) list.[71] Both organizations rely heavily on English-language international sources for information on drone strikes overseas. They rigorously vet the cited news media and often highlight the variability between media sources — they provide high and low estimates of militant deaths, for instance — when inputting data into their final lists. The sources used to create observations in the dataset are publicly available for independent verification. Both the NAF and BIJ cross-check their data in an attempt to ensure more accurate figures.

[70] Bergen, Peter, David Sterman, and Melissa Salyk-Virk. "Methodology." New America. Accessed October 7, 2019. https://www.newamerica.org/in-depth/americas-counterterrorism-wars/methodology/.
[71] The Bureau of Investigative Journalism. "Our Methodology," February 2017. https://www.thebureauinvestigates.com/explainers/our-methodology.

Yet, there are concerns about the reliability of international news as a secondary source.[72] First, media coverage of drone strikes is inconsistent. Deaths might not be caught by news articles, or, sometimes, an entire strike is completely absent from reports. Second, the media relies on limited sources, such as anonymous officials or unverifiable eyewitnesses unwilling to be named. This can prevent additional verification from independent researchers. Third, the definition of a militant or a civilian is not standardized by the media. Curating lists often forces judgment calls in classifying civilians and militants, especially since the official government definitions are purposefully vague and intended to suppress civilian casualty counts.

This thesis purposefully avoids the use of civilian casualty and militant death counts due to the significant uncertainty in the reporting of those statistics. The NAF and BIJ lists only pose a reliability concern when a drone strike observation may be completely missing from the data. Though the likelihood that both lists completely miss a drone strike observation is not high, it should still be noted that quantitative results might suffer from this potential source of error.

The New America Foundation's list dates back to 2002 under the Bush administration and shows strikes as recent as 2019. The list is not publicly available anymore, so I received the dataset via email from the NAF's Melissa Salyk-Virk upon further inquiry. The NAF dataset identifies strikes given by their date and location, providing the media reports on which the observation entries were based as well.

Since the NAF's data does not include Afghanistan drone strikes, the BIJ's data will be used as a supplement. Drone strikes in Afghanistan date back to 2015, according to the BIJ's list.

[72] Grut, Chantal. "Counting Drone Strike Deaths." Human Rights Clinic at Columbia Law School, October 2012. https://www.law.columbia.edu/sites/default/files/microsites/human-rights-institute/files/COLUMBIACountingDronesFinal.pdf.

Additionally, the BIJ provides an exhaustive list of reported airstrikes in their dataset, but those entries not reported as drone strikes were filtered out for my quantitative analysis.

In my dataset, the lists were combined and grouped by year, country, and target terrorist organization to create the observations of drone strikes in a given year.

In addition to the main independent variable, a lagged drone strike variable was introduced to test for any lagged effects on the dependent variable. A cumulative drone strike variable, which measures the total number of drone strikes that an organization had experienced by the end of the observation's year, was included as well to test the effect of a sustained drone campaign.

Dependent Variable

The dependent variable will be the tactical diversity of terrorist organizations. This is measured by the number of different tactics used in a given year by a terrorist organization. The Global Terrorism Database (GTD), which tracks worldwide incidents of terrorism, categorizes each attack into one of nine tactic types and twenty-two target types. For example, the database lists the different attack types as Assassination, Hijacking, Kidnapping, Barricade Incident Bombing/Explosion, Armed Assault. Unarmed Assault, Facility/Infrastructure Attack, and Unknown.[73] This provides a fertile ground for assessing the diversity in both the tactics and targets of a terrorist organization. Attack targets may not be employed in the analysis but could be easily added if the initial results warrant further investigation into terrorists' targets. The dependent variable, like the independent variable, will be organized by the country, year, and organization.

[73] "Global Terrorism Database Codebook: Inclusion Criteria and Variables." National Consortium for the Study of Terrorism and Responses to Terrorism, July 2018.

The GTD categorizes the target of each attack as well, using an exhaustive 22 categories. These categories include Business, Government (General), Police, Military, Abortion Related, Airports & Aircraft, Government (Diplomatic), Educational Institution, Food or Water Supply, Journalists & Media, Maritime, NGO, Other, Private Citizens & Property, Religious Figures/Institutions, Telecommunication, Terrorists/Non-State Militias, Tourists, Transportation (Other than Aviation), Unknown, Utilities, and Violent Political Parties. The target types were included in the final dataset to assess changes in terrorists' targets.

Control Variables

My analysis includes control variables that account for three factors: counter-terrorism strategy, country factors, and terrorist organization characteristics. They are confounders — variables that might cause both the dependent and independent variable — whose control is critical to isolating the effect of the independent variable in regression models.[74] The following variables are both theoretically relevant, meaning they have a high probability of being confounders, and among the standard controls for quantitative counter-terrorism research.

Drone strikes are but a piece of the broader U.S. counter-terrorism strategy, and their use is often correlated with other elements of national power (foreign aid and troop training).[75] Foreign aid and troop interventions are both associated with increases/decreases in terrorist activity as well.[76] To account for other elements of the broader U.S. counter-terrorism strategy, I include the logged monetary contribution of economic and military aid projects to the four

[74] Seawright, Jason. *Multi-Method Social Science: Combining Qualitative and Quantitative Tools*. Strategies for Social Inquiry. Cambridge University Press, 2016., p. 68.
[75] Guerra, Felix. "A Holistic Strategy? Examining How Armed Drone Strikes Interact With Other Elements of National Power." Master's Thesis, Naval Postgraduate School, 2017.
[76] Young, Joseph K., and Michael G. Findley. "Can Peace Be Purchased? A Sectoral-Level Analysis of Aid's Influence on Transnational Terrorism." *Public Choice* 149, no. 3 (October 11, 2011): 365. https://doi.org/10.1007/s11127-011-9875-y.

countries found in the dataset. Data on foreign aid was provided by USAID.[77] I include the number of military personnel trained by U.S. forces overseas, which proxies the strength of local counter-terrorism efforts and U.S. military presence on the ground. Data for the number of military trainees overseas was provided by the Security Assistance Monitor[78]

Terrorism literature has long posited that terrorism is a consequence of a country's structural condition.[79] Metrics that attempt to capture the fragility of a state and the government's style or strength can help control for confounding country-level factors. For instance, terrorism may be a response to a government that lacks non-violent mechanisms for addressing grievances. I use two variables to measure differences between countries. VDem's liberal democracy score was included as a measure of the government's regime type.[80] The Institute for Systemic Peace provided their State Fragility Index, which measures a state's capacity to manage conflict, social services, and other bureaucratic functions of the state.[81] Similar variables have been used in past work on tactical diversity.[82]

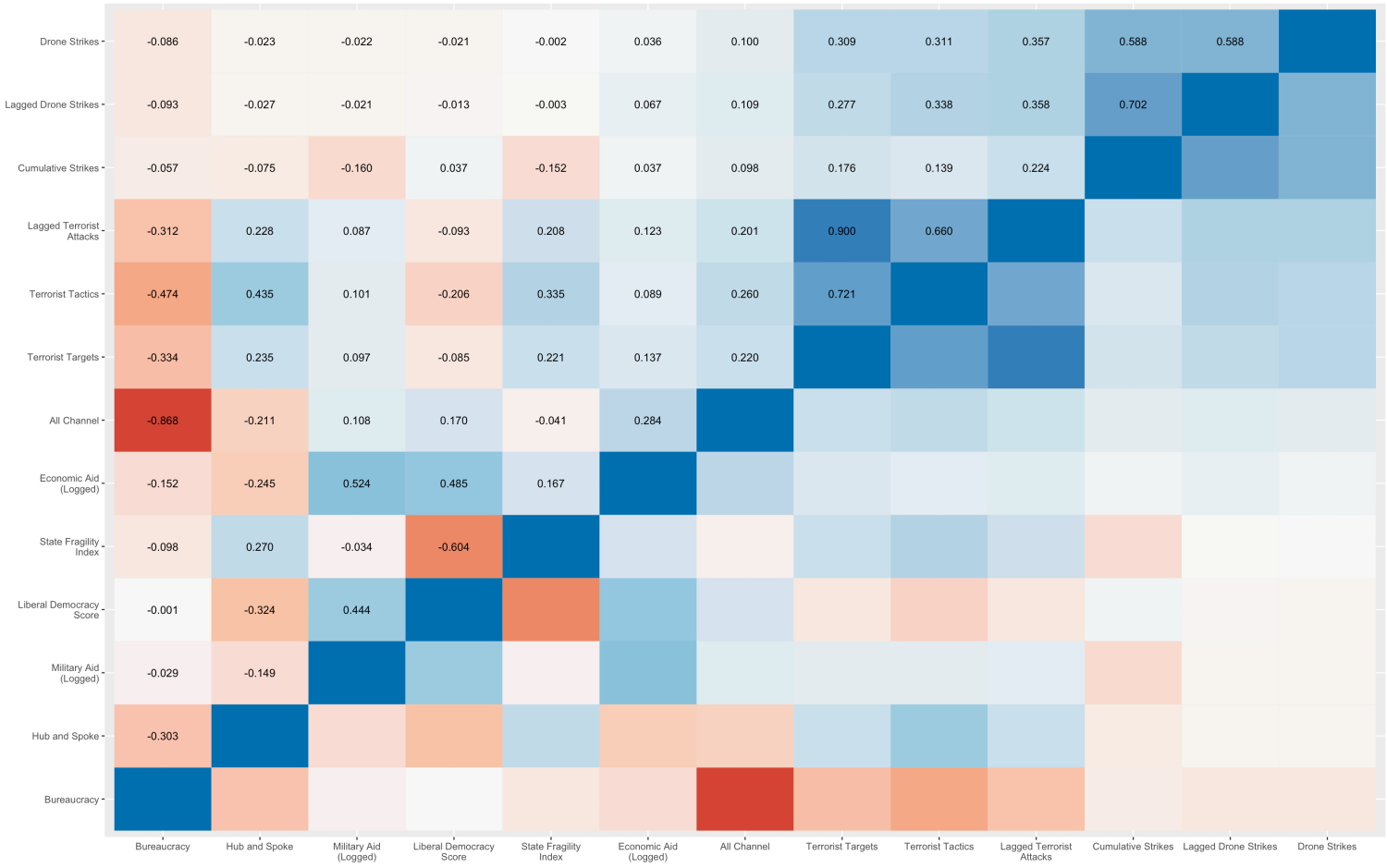
Characteristics of individual terrorist organizations should be controlled because organizational structure, as an example, can immunize terrorist organizations from the effects of targeted killing campaigns.[83] An organization with a robust leadership structure may not be targeted by drone strikes for that reason. Prior work on terrorist organization structure has categorized organizations and used leadership structure as a control variable in assessing the impact of counter-terrorism efforts on terrorist organizations.[84] Kilberg's classification of

[77] "Foreign Aid Explorer," USAID, accessed December 24, 2019, https://explorer.usaid.gov/.
[78] "Military Trainees," Security Assistance Monitor, accessed December 24, 2019, http://securityassistance.org/content/military-trainees-downloads.
[79] Mitakides, Katherine Wynn, 2017, p. 11-12
[80] "V-Dem Dataset - Version 9," Varieties of Democracy, accessed January 13, 2020, https://www.v-dem.net/en/data/data-version-9/.
[81] "INSCR Data Page," Institute for Systemic Peace, accessed December 24, 2019, http://www.systemicpeace.org/inscrdata.html.
[82] Horowitz, Perkoski, and Potter, 2018, p. 156
[83] Jordan, 2009, p. 727
[84] Horowitz, Perkoski, and Potter, 2018, p. 156; Kilberg, 2012.

terrorist organizations as Bureaucratic, All-Channel, Market, and Hub-and-Spoke were used as benchmarks. I coded the organizations in my dataset according to the criterion listed in Kilberg's article and information gathered from profiles and academia on terrorist organizations.

The final control variable — a one-year lag on an observation's total terrorist attacks — was included because an organization's actions in a prior year can indicate their capacity entering the next, and more capable organizations might attract more attention from counter-terrorism efforts. This is a small attempt at solving a possible endogeneity problem, but more complex efforts to account for the possibility that more tactically diverse organizations are simply targeted more by drone strikes will be discussed in the next chapter.

Table 4.2: Correlation Table, Variables



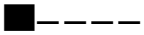
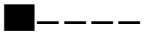
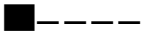
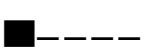
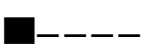
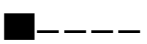
The Final Dataset and Descriptive Statistics

Some descriptive statistics of the dataset should be helpful in interpreting the results of the following chapter.

The final dataset contains 175 country-year-organization observations, including nine different targeted organizations (Al-Qaeda, Al-Shabaab, Al-Qaeda in the Arabian Peninsula, the Baitullah Mehsud Faction, the Haqqani Network, ISIS, the Islamic Movement of Uzbekistan, the Pakistani Taliban, and the Afghanistan Taliban) over the four observed countries (Yemen, Somalia, Pakistan, and Afghanistan). Observation years range from 2001–2018, for the use of lagged terrorist attack data required observations one year prior to the first drone strike, which occurred in 2002. The GTD does not presently have 2019 data, so 2018 was the final year included in the dataset.

Originally, there were only 40 observations in which both a terrorist attack and a drone strike occurred, but the dataset was expanded to include observations where either a terrorist attack or a drone strike occurred. Observations in which neither a terrorist attack nor a drone strike occurred were included as well to mitigate any accidental selection bias. These "zero-zero" observations were only added after the first year of recorded activity against or by a given terrorist organization. As an example, terrorist organization X in country Y committed an attack in 2003 and was later targeted by a drone strike in 2005. Since 2003 is the year of earliest recorded activity by organization X in country Y, "zero-zero" observations for organization X in country Y were included from 2003 onward. Organization X in country Y would have an observation in 2004 in which neither a drone strike nor a terrorist attack occurred.

Table 4.3: Descriptive Statistics, Variables

Variable	*Observations*	*Mean*	*Standard Deviation*	*Min*	*Max*	*Histogram*
Drone Strikes	175	4.18	10.08	0.00	69.00	
Cumulative Strikes	175	21.76	40.61	0.00	217.00	
Lagged Drone Strikes	175	3.87	9.81	0.00	69.00	
Terrorist Tactics	175	1.58	2.46	0.00	8.00	
Terrorist Targets	175	19.65	55.52	0.00	322.00	
Economic Aid (Logged)	175	20.89	1.21	14.93	22.69	
Military Aid (Logged)	175	19.25	4.23	0.00	23.64	
State Fragility Index	175	18.87	2.98	15.00	25.00	
Liberal Democracy Score	175	0.22	0.08	0.04	0.34	
Lagged Terrorist Attacks	175	17.03	50.42	0.00	322.00	
All Channel	175	0.38	0.49	0.00	1.00	
Hub and Spoke	175	0.07	0.25	0.00	1.00	
Bureaucracy	175	0.55	0.50	0.00	1.00	

The mean number of drone strikes for a given observation is 4.18, while the mean number of terrorist tactics employed is 1.58 against an average of 2.42 different target types. On average, terrorist organizations committed 19.65 attacks in a given year. This data and the correlation (.71) between the number of terrorist attacks committed and an organization's tactical

diversity suggest that organizations capable of committing more attacks diversify their operations.

The most heavily targeted organizations were AQAP (Yemen, 217), Pakistani Taliban (Pakistan, 132), and the Afghanistan Taliban (Afghanistan, 110), while the most drone strikes occurred in Pakistan (245). Afghanistan (224) and Yemen (222). Somalia (42) is host to the least strikes, but the pace of strikes in Somalia has been accelerating in recent years. This is likely a result of Trump's reclassification of Somalia as an active area of hostility.

Drone activity was constant during President Trump's first years in office: 165 strikes against terrorist organizations were recorded in the dataset. Though, the number of drone strikes per year has been decreasing. In 2018, there were only 34 recorded strikes against listed terrorist organizations. Strikes that were listed as against "unknown" groups were excluded from final counts to prevent misclassification biases. The downward trend, though clear, is more likely a function of declining ISIS activity than a shift away from drones as a counter-terror tool of choice — the attack on Iranian General Soleimani is evidence of this.

Chapter 5

Empirical Results

Hypothesis 1a

The OLS regression results for the first three models, which test the relationship between drone strikes and an organization's tactical diversity in a given year and country, are shown below in Table 5.1.

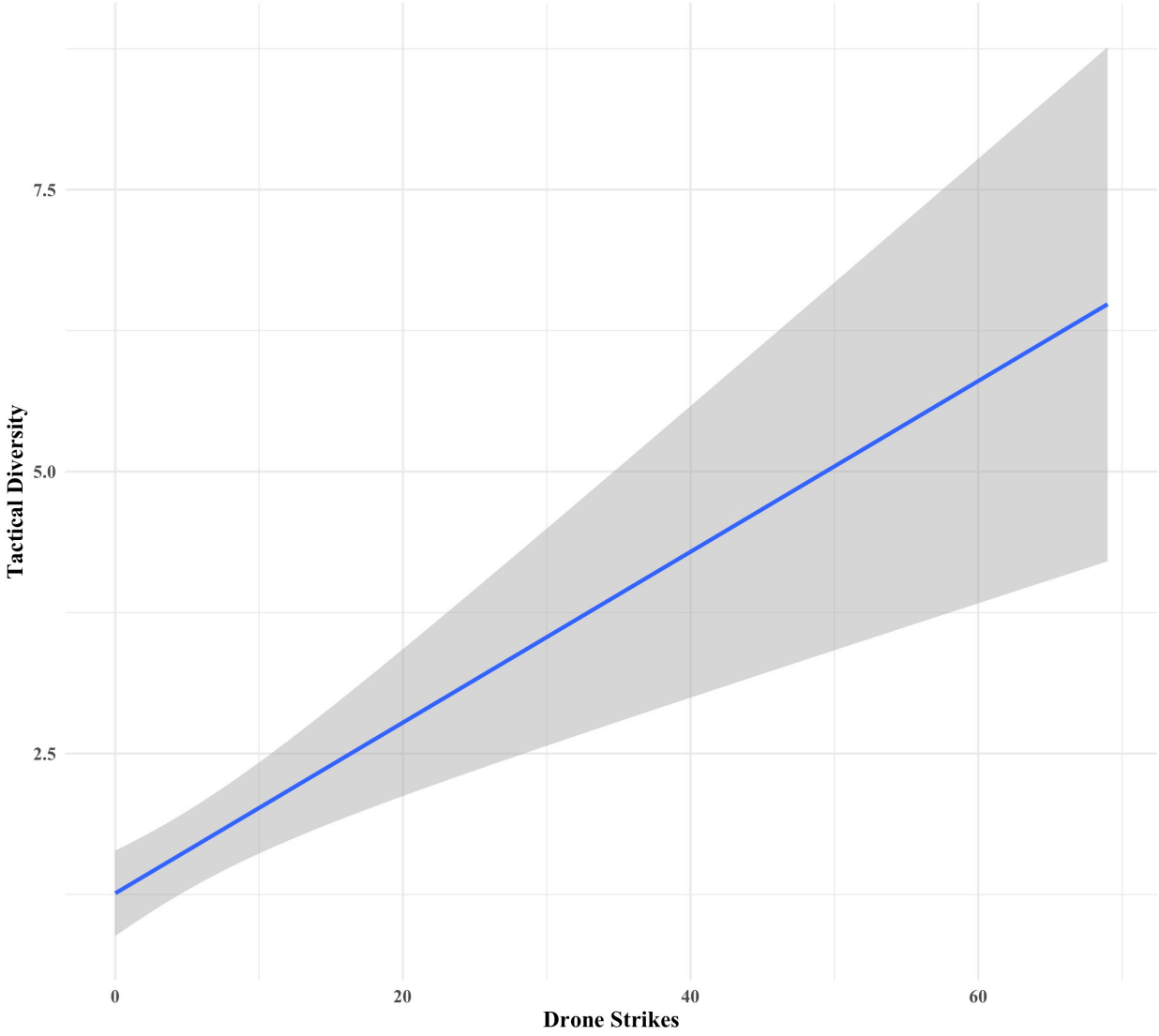
The first model indicates that drone strikes have a statistically significant positive relationship with a terrorist organization's tactical diversity. The coefficient is .076 and standard error of the independent variable is .018 (significant at the .001 level). In essence, the first model indicates that a terrorist organization adds a new tactic to their repertoire for roughly every 13 drone strikes conducted against them in a given year. The relationship can be visualized in Figure 5.1, which shows the predicted tactical diversity of a terrorist organization increase from about 1 to 6.5 through the full range of the drone strikes in a given year. As terrorist group level controls are added in Model 2, there is a trivial change in the results of the model. The coefficient in model rests at .079 with the independent variable's standard error of .018 (significant at the .001 level). The marginal effect of drone strikes cuts in half, however, when the country-level and group-level controls are added in Models 3 and 4, providing coefficients of .036 and .041, respectively. Both models' independent variables have a standard error of .013 and are significant at the .01 level. Model 4, which contains all control variables, projects a terrorist group to add a new tactic to their repertoire for every 25 drone strikes in a given year.

Table 5.1: Tactical Diversity by year (OLS)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Estimates*	*Estimates*	*Estimates*	*Estimates*
(Intercept)	1.261 ***	-1.183	-1.369	-2.552
	(0.192)	(3.234)	(2.334)	(2.354)
Drone Strikes	0.076 ***	0.079 ***	0.036 **	0.041 **
	(0.018)	(0.018)	(0.013)	(0.013)
Economic Aid (Log)		0.064	0.030	-0.024
		(0.173)	(0.124)	(0.161)
Military Aid (Log)		0.058	0.059	0.086 *
		(0.050)	(0.034)	(0.034)
Military Trainees		-0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)
Lagged Terrorist Attacks			0.023 ***	0.022 ***
			(0.003)	(0.003)
All Channel			1.129 ***	1.207 ***
			(0.270)	(0.263)
Hub and Spoke			3.798 ***	3.304 ***
			(0.528)	(0.531)
Liberal Democracy Score				-1.936
				(2.829)
State Fragility Index				0.119
				(0.069)
Observations	175	175	175	175
R^2 / R^2 adjusted	0.097 / 0.091	0.111 / 0.090	0.594 / 0.577	0.623 / 0.603

** p<0.05 ** p<0.01 *** p<0.001*

Figure 5.1: Tactical Diversity by year (OLS)



Note: Estimate obtained from Model 1, Table 5.1

Group and country-level controls in Models 3 and 4 decreased the marginal effect of drone strikes relative to those produced by Model 1; though, there was a slight increase in the coefficient moving from Model 3 to 4.

To confirm these results, two additional types of regressions were conducted: an ordered logit model and a fixed-effects model. The results from the ordered logit model are shown in Table 5.2

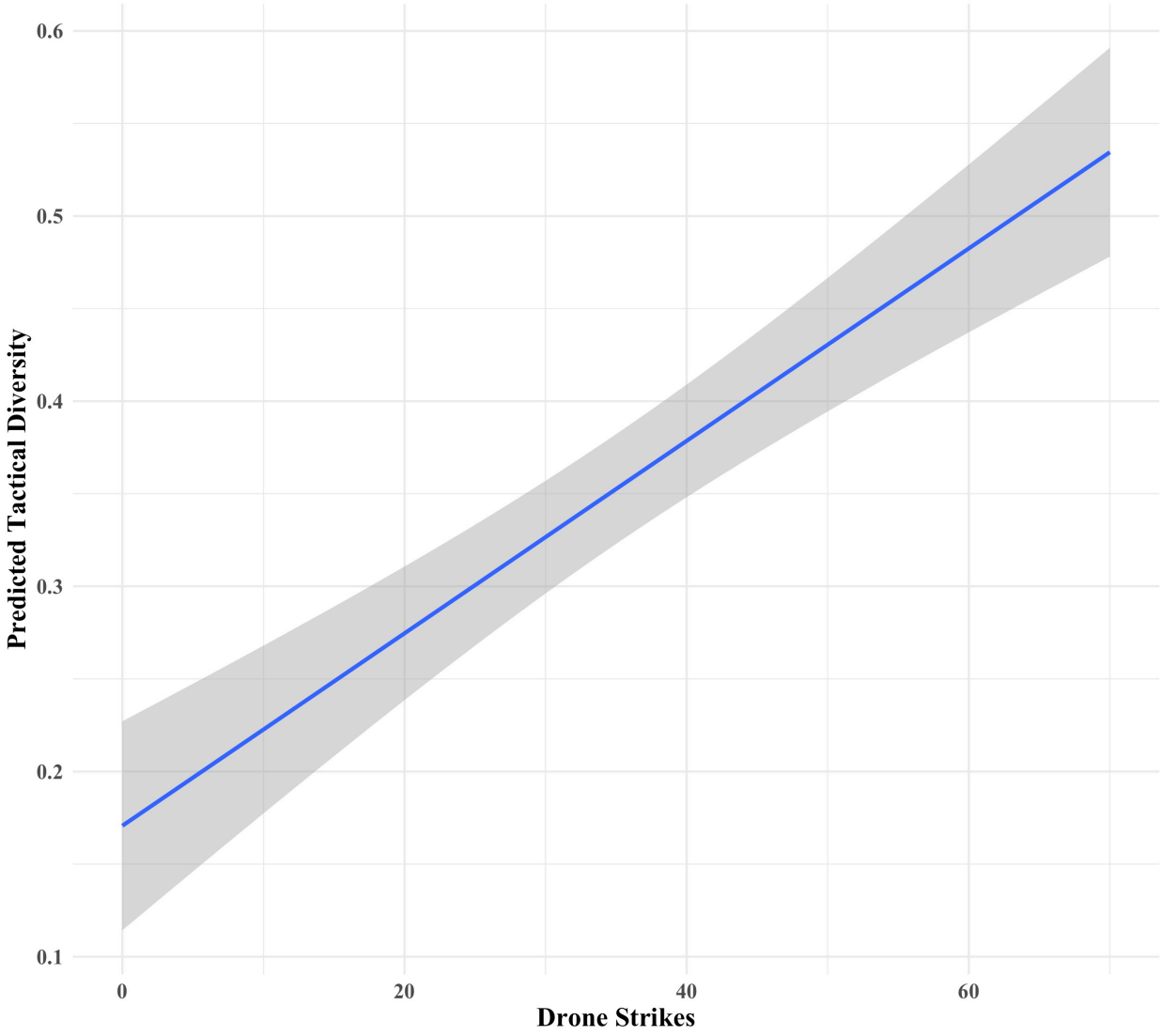
Table 5.2: Tactical Diversity by year (Ordered Logit)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*
Drone Strikes	1.051 ***	1.053 ***	1.043 **	1.051 **
	(0.014)	(0.014)	(0.016)	(0.016)
Economic Aid (Log)		1.153	1.218	1.191
		(0.159)	(0.199)	(0.238)
Military Aid (Log)		1.002	1.023	1.070
		(0.041)	(0.045)	(0.046)
Military Trainees (In Hundreds)		0.999	0.998	0.996
		(0.002)	(0.002)	(0.003)
Lagged Terrorist Attacks			1.023 ***	1.021 ***
			(0.005)	(0.005)
All Channel			3.567 ***	4.597 ***
			(0.351)	(0.374)
Hub and Spoke			36.124 ***	23.206 ***
			(0.664)	(0.683)
Liberal Democracy Score				0.021
				(3.569)
State Fragility Index				1.121
				(0.091)
Observations	175	175	175	175
R^2 Nagelkerke	0.080	0.087	0.474	0.507
		** p<0.05*	*** p<0.01*	**** p<0.001*

Though the third model in Table 5.2 has a slightly lower coefficient, the four models have comparable results. The odds ratios for the fourth model, which includes all the control variable groups, indicates that a terrorist organization is 1.05 times more likely to add a tactic to its repertoire for each additional drone strike conducted against the organization in a given year. This can be hard to interpret, so Figure 5.2 displays the projected outcomes of the ordered logit

model when holding all control variables at their mean and assuming the terrorist organization is structured bureaucratically.

Figure 5.2: Predicted Tactical Diversity by year (Ordered Logit)



Note: Estimate obtained from Model 4, Table 5.2

The substantive effects of the ordered logit model are quite limited. Arriving at the max number of drone strikes in a given year only increases the predicted tactical diversity of a targeted group by half a tactic. However, there is a possibility that the low expected values are driven by the model's predisposition to predict an organization to not conduct an attack. This

result is understandable since there are a number of observations without a recorded terrorist attack.

The fixed-effects models, shown in Table 5.3, again confirms the results. Model one (group-level fixed effects) reaches the .05 level of statistical significance with a standard error of .012 on the independent variable and a coefficient of .026. Thus, a terrorist organization is expected to add another tactic to their repertoire for every 39 drones strikes conducted against the group in a given year. Model two produced similar but more substantive results, predicting a terrorist group to add a tactic to their repertoire for every 25 drone strikes conducted against the organization in a given year. Model two reaches a significance level of .01 with a .014 standard error on the independent variable.

Both the fixed effects and ordered logit models support the initial findings in Table 5.1. There are some discrepancies in the substantive marginal effect of drone strikes, which are shown in the predicted values of the ordered logit model. However, both the OLS and country-level fixed-effects models display similar marginal effects for the drone strike independent variable.

Table 5.3: Tactical Diversity by year (Fixed Effects)

	Model 1	**Model 2**
Predictors	*Estimates*	*Estimates*
(Intercept)	-10.976 **	1.297
	(3.350)	(3.502)
Drone Strikes	0.026 *	0.040 **
	(0.012)	(0.014)
Economic Aid (Log)	0.524 ***	-0.059
	(0.155)	(0.164)
Military Aid (Log)	0.056 *	0.056
	(0.028)	(0.033)
Military Trainees (In Hundreds)	-0.000	-0.000 *
	(0.000)	(0.000)
Liberal Democracy Score	1.461	
	(2.716)	
State Fragility Index	-0.081	
	(0.083)	
AQ Pakistan	0.036	
	(0.633)	
AQ Somalia	1.443 **	
	(0.544)	
Al-Shabaab Somalia	6.668 ***	
	(0.558)	
AQAP Yemen	2.956 ***	
	(0.739)	
Baitullah Mehsud Faction Pakistan	-0.348	
	(0.672)	
Haqqani Network Afghanistan	0.651	
	(0.456)	
Haqqani Network Pakistan	-0.323	
	(0.678)	

ISIS Afghanistan	4.984 ***	
	(0.724)	
ISIS Pakistan	2.618 ***	
	(0.769)	
ISIS Somalia	0.544	
	(0.920)	
ISIS Yemen	1.429	
	(0.858)	
Islamic Movement of Uzbekistan Afghanistan	-0.232	
	(0.505)	
Islamic Movement of Uzbekistan Pakistan	-0.364	
	(0.693)	
Taliban Afghanistan	5.624 ***	
	(0.403)	
Taliban Pakistan	0.500	
	(0.649)	
Lagged Attacks		0.020 ***
		(0.003)
All Channel		1.207 ***
		(0.262)
Hub and Spoke		4.235 ***
		(0.609)
Pakistan		-1.323 ***
		(0.332)
Somalia		-1.123
		(0.569)
Yemen		-0.365
		(0.661)
Observations	175	175
R^2 / R^2 adjusted	0.803 / 0.776	0.642 / 0.620

** p<0.05 ** p<0.01 *** p<0.001*

Hypothesis 1b

The same procedure was repeated with a lag on the independent variable, meaning the number of tactics an organization used in a given year was regressed against the number of drone strikes from the year prior. The results can be seen below in Table 5.4.

Table 5.4: Tactical Diversity by year, Lagged Drone Strikes (OLS)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Estimates*	*Estimates*	*Estimates*	*Estimates*
(Intercept)	1.249 ***	-0.418	-1.065	-2.162
	(0.188)	(3.208)	(2.312)	(2.334)
Lagged Drone Strikes	0.085 ***	0.085 ***	0.042 **	0.045 ***
	(0.018)	(0.018)	(0.013)	(0.013)
Economic Aid (Log)		0.026	0.013	-0.048
		(0.172)	(0.123)	(0.160)
Military Aid (Log)		0.059	0.060	0.086 *
		(0.049)	(0.034)	(0.034)
Military Trainees		0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)
Lagged Terrorist Attacks			0.023 ***	0.021 ***
			(0.003)	(0.003)
All Channel			1.126 ***	1.204 ***
			(0.268)	(0.261)
Hub and Spoke			3.826 ***	3.331 ***
			(0.524)	(0.527)
Liberal Democracy Score				-1.752
				(2.810)
State Fragility Index				0.122
				(0.068)
Observations	175	175	175	175
R^2 / R^2 adjusted	0.115 / 0.109	0.126 / 0.106	0.600 / 0.583	0.629 / 0.609

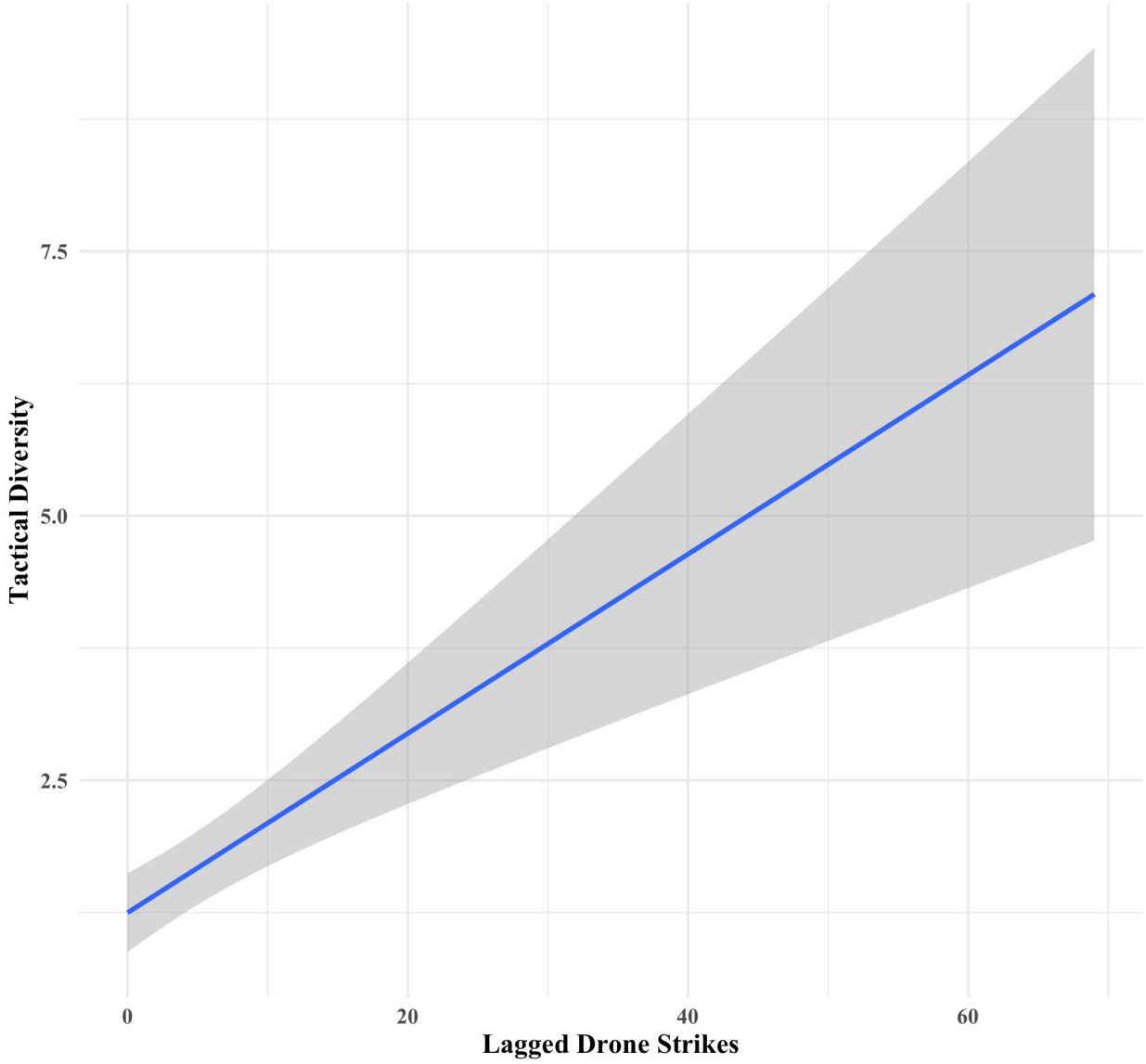
** p<0.05 ** p<0.01 *** p<0.001*

Lagging the independent variable does not, at first, seem to substantively change the marginal effect of drone strikes on an organization's tactical diversity in a given year. Both the first two models have similar coefficients to those of Table 5.1, and Models 1 and 2 both obtain significance at the .001 level. Models 1 and 2 indicate that a terrorist organization should add a new tactic to their repertoire for every 12 drone strikes against an organization in the year prior to observation. The coefficient in Models 3 and 4 halves from Models 1 and 2. The pattern seen in Table 5.1 repeats here. Model 4 reaches statistical significance at the .001 level with a standard error of .013 on the independent variable, indicating that a terrorist group should use a new tactic for every 23 attacks against a terrorist organization in the in the year prior to observation. The relationship can be visualized in Figure 5.3.

Lagging the independent variable does not increase the model's predictive power either. Caution is generally required when comparing models solely on their R-squared or adjusted R-squared values, but such comparisons are possible when historical data can be considered applicable to making predictions, the observations in both models are identical, and the dependent variable in both models are identical.[85] These conditions hold for the models displayed in Tables 5.1 and 5.4, but the adjusted R-squared values are practically identical at .603 and .609, respectively. Lagging the number of drone strikes against a terrorist organization in a given year makes little difference for the primary OLS models.

[85] Dranove, David Stuart. "Practical Regression: Regression Basics." Northwestern University Kellog School of Management, 2012. https://www.scholars.northwestern.edu/en/publications/practical-regression-regression-basics., p. 8-9.

Figure 5.3: Tactical Diversity by year, Lagged Drone Strikes (OLS)



Note: Estimate obtained from Model 1, Table 5.4

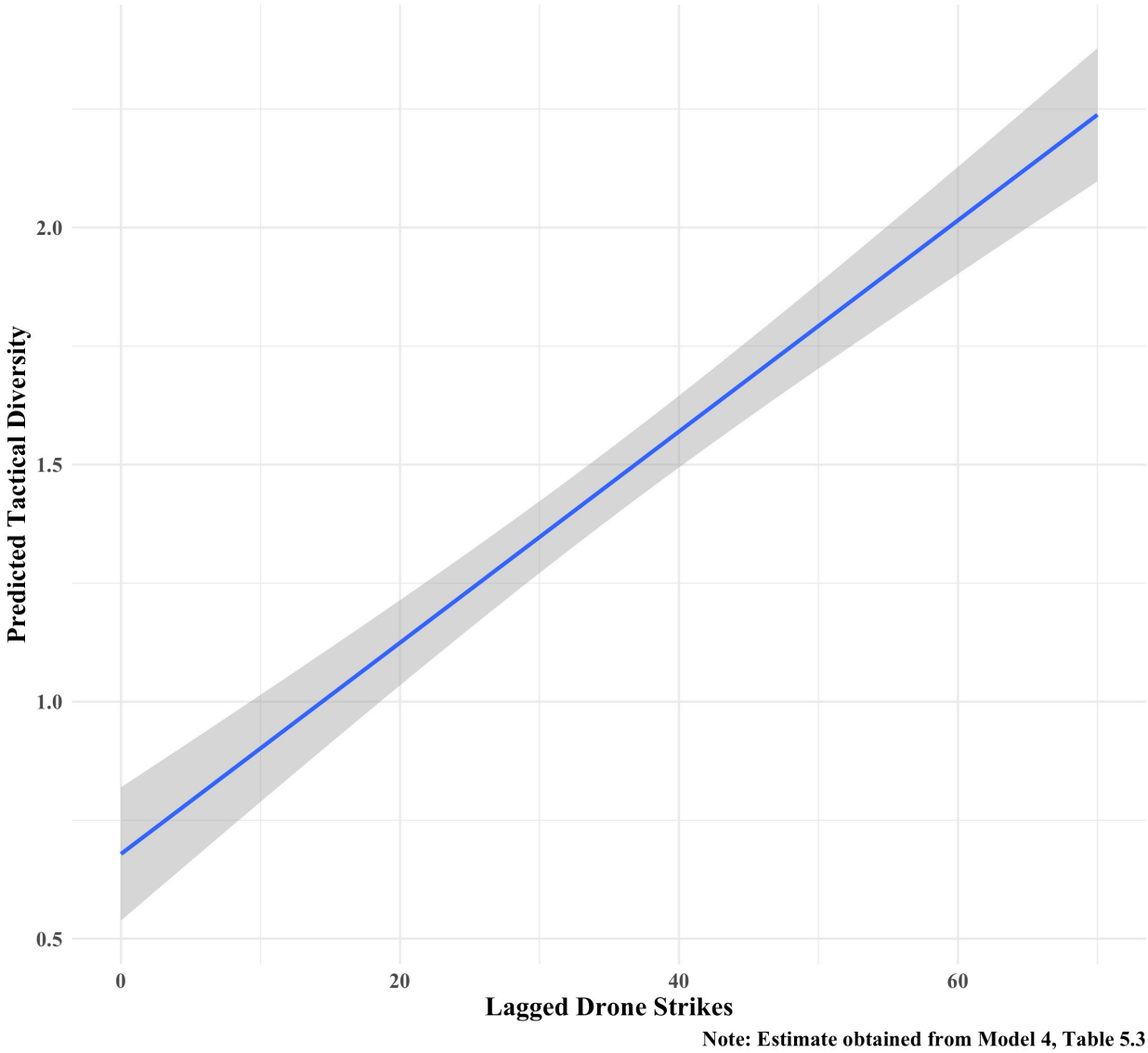
The ordered logit's results can be seen in Table 5.5. The patterns from Table 5.2 are repeated in Table 5.5: Models 1, 2, and 4 have similar odds ratios for drone strikes, and they are all significant at the .001 level. Model 3 has a slight dip in both significance and the independent variable's coefficient. However, the odds ratio for a lagged drone strike is slightly higher than those of Table 5.2. This translates to the model's predicted values, as seen in Figure 5.4.

Table 5.5: Tactical Diversity by year (Ordered Logit)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*
Lagged Drone Strikes	1.063 ***	1.062 ***	1.054 **	1.060 ***
	(0.014)	(0.014)	(0.017)	(0.016)
Economic Aid (Log)		1.102	1.178	1.122
		(0.159)	(0.200)	(0.239)
Military Aid (Log)		1.008	1.030	1.075
		(0.041)	(0.045)	(0.046)
Military Trainees (In Hundreds)		1.000	1.000	0.998
		(0.002)	(0.002)	(0.002)
Lagged Terrorist Attacks			1.022 ***	1.021 ***
			(0.005)	(0.005)
All Channel			3.736 ***	4.829 ***
			(0.352)	(0.373)
Hub and Spoke			37.996 ***	24.216 ***
			(0.666)	(0.683)
Liberal Democracy Score				0.042
				(3.568)
State Fragility Index				1.142
				(0.091)
Observations	175	175	175	175
R^2 Nagelkerke	0.108	0.112	0.481	0.513
		** p<0.05*	*** p<0.01*	**** p<0.001*

The predicted values shown in Figure 5.4 are much greater than those of Figure 5.2, going from the minimum to the maximum value of lagged drone strikes — when all controls are held at the mean and the organization is assumed to be run bureaucratically — increases the predicted tactical diversity from about .75 to about 2.5.

Figure 5.4: Predicted Tactical Diversity by year (Ordered Logit)



Note: Estimate obtained from Model 4, Table 5.3

This is still a relatively small predicted value since the number of terrorist tactics in a given year can reach a maximum of eight. It is clear, though, that lagged drone strikes have a more substantive marginal effect on the dependent variable than that of drone strikes in the observation year.

Table 5.6 displays the results from the fixed-effects regression with the lagged drone strike independent variable.

Table 5.6: Tactical Diversity by year (Fixed Effects)

	Model 1	**Model 2**
Predictors	*Estimates*	*Estimates*
(Intercept)	-9.865 **	1.506
	(3.222)	(3.465)
Lagged Drone Strikes	0.037 **	0.045 **
	(0.011)	(0.013)
Economic Aid (Log)	0.471 **	-0.071
	(0.151)	(0.163)
Military Aid (Log)	0.057 *	0.057
	(0.027)	(0.033)
Military Trainees (In Hundreds)	-0.000	-0.000
	(0.000)	(0.000)
Liberal Democracy Score	1.644	
	(2.657)	
State Fragility Index	-0.084	
	(0.081)	
AQ Pakistan	-0.055	
	(0.615)	
AQ Somalia	1.373 *	
	(0.528)	
Al-Shabaab Somalia	6.579 ***	
	(0.538)	
AQAP Yemen	2.751 ***	
	(0.690)	
Baitullah Mehsud Faction Pakistan	-0.415	
	(0.656)	
Haqqani Network Afghanistan	0.659	
	(0.447)	
Haqqani Network Pakistan	-0.411	
	(0.660)	

ISIS Afghanistan	4.723 ***	
	(0.702)	
ISIS Pakistan	2.561 ***	
	(0.751)	
ISIS Somalia	0.501	
	(0.898)	
ISIS Yemen	1.408	
	(0.837)	
Islamic Movement of Uzbekistan Afghanistan	-0.232	
	(0.495)	
Islamic Movement of Uzbekistan Pakistan	-0.414	
	(0.677)	
Taliban Afghanistan	5.560 ***	
	(0.394)	
Taliban Pakistan	0.366	
	(0.627)	
Lagged Attacks		0.020 ***
		(0.003)
All Channel		1.204 ***
		(0.259)
Hub and Spoke		4.262 ***
		(0.604)
Pakistan		-1.309 ***
		(0.325)
Somalia		-1.106
		(0.562)
Yemen		-0.333
		(0.641)
Observations	175	175
R^2 / R^2 adjusted	0.810 / 0.784	0.647 / 0.626

** p<0.05 ** p<0.01 *** p<0.001*

The results of Model 1, the group-level fixed effects model, have a higher marginal effect than the models of Table 5.3. With a coefficient of .037, Model 1 predicts that a terrorist organization will add a new tactic to its repertoire for every 27 drone strikes in the year prior to observation. Model 2 predicts that a terrorist organization will use a new tactic for every 25 drone strikes in the year prior to observation. Both Model 1 and Model 2 reach the .01 significance threshold with a standard error on the independent variable of .011 and .013 respectively.

The adjusted R-squared values for the models are .784 and .626. The fixed-effects model with the lagged independent variable do not provide stronger adjusted R-squared values than those of Table 5.3, as Models 1 and 2 from Table 5.3 boast an adjusted R-squared value of .776 and .620, respectively. Comparing adjusted R-squared values does not provide an explanation for the stronger marginal effects of the lagged independent variable.

To determine the effect of a lagged independent variable, an OLS regression including an interaction term between the drone strikes variable and the lagged drone strikes variable was conducted. The results are depicted in Table 5.7, and the interplot of the relationship between the independent variable and the lagged independent variable can be seen in Figure A.1.

The model indicates that there is not a statistically significant relationship between the drone strikes in one year and in the previous year. The interplot graph confirms this relationship, as the large confidence interval limits the likelihood the model is accurate. Additionally, there does not seem to be a substantive relationship between drone strikes in one year and its previous year. The importance of these results will be explored more in the following chapter. Simply, the lagged independent variable may have a stronger marginal effect because two years of drone strikes already had impacted the dependent variable.

Table 5.7: Tactical Diversity by year, Lagged Drone Strikes Interaction (OLS)

	Model 1
Predictors	*Estimates*
(Intercept)	-2.231 (2.312)
Drone Strikes	0.044 * (0.019)
Economic Aid (Log)	-0.061 (0.158)
Military Aid (Log)	0.090 ** (0.034)
Military Trainees	-2.091 (2.789)
Lagged Terrorist Attacks	0.134 * (0.068)
All Channel	0.020 *** (0.003)
Hub and Spoke	1.210 *** (0.258)
Liberal Democracy Score	3.231 *** (0.526)
State Fragility Index	-0.000 (0.000)
Lagged Drone Strikes	0.074 ** (0.026)
Lagged Drone Strikes * Drone Strikes	-0.002 (0.001)
Observations	175
R^2 / R^2 adjusted	0.642 / 0.618

** p<0.05 ** p<0.01 *** p<0.001*

Hypothesis 2

To test this hypothesis, the independent variable was changed to the cumulative number of drone strikes a terrorist organization had experienced by observation year's end. Additional control variable groups were added to successive models, and the results are shown in Table 5.8.

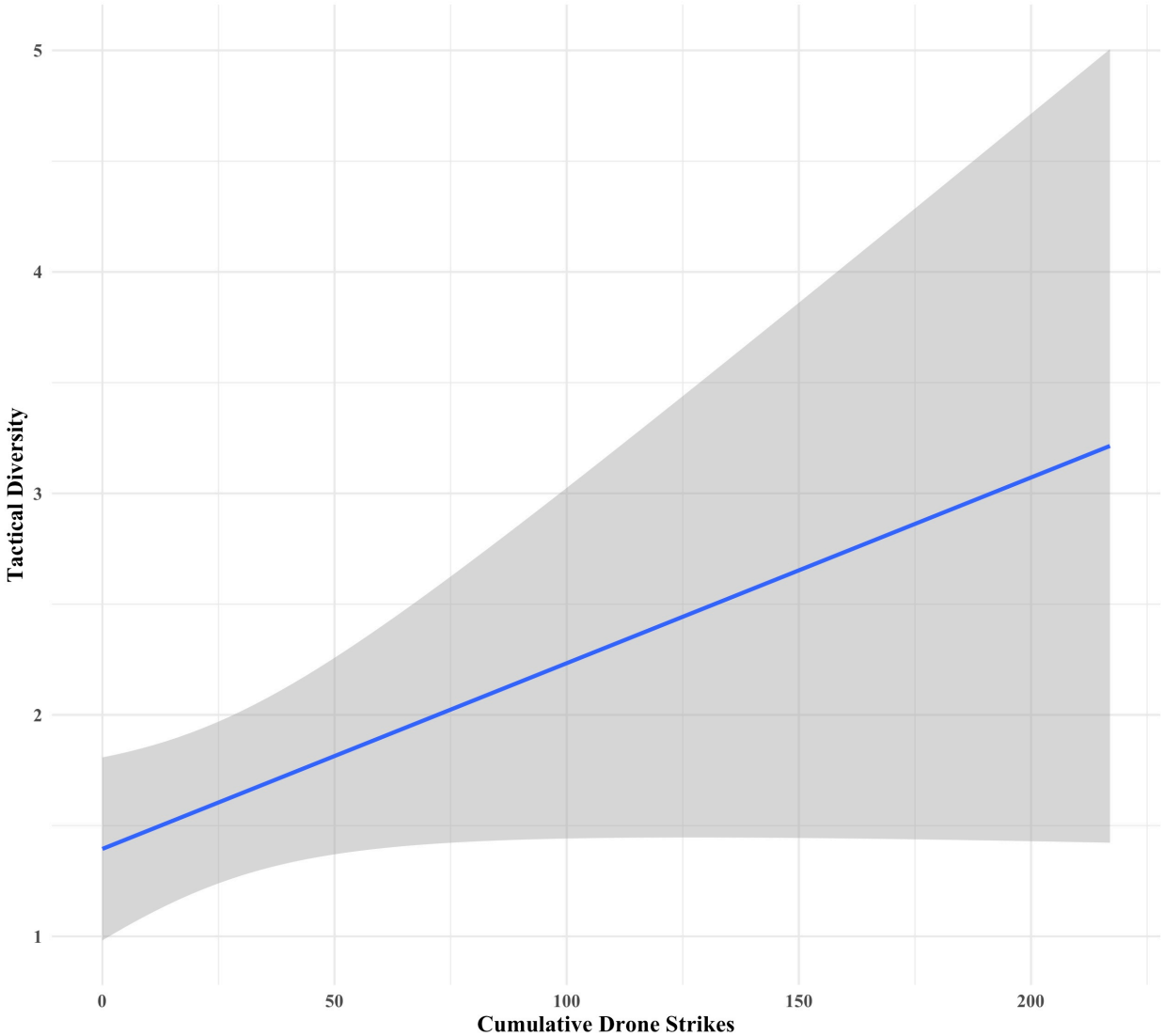
Table 5.8: Tactical Diversity by year, Cumulative Drone Strikes (OLS)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Estimates*	*Estimates*	*Estimates*	*Estimates*
(Intercept)	1.395 ***	-0.674	-0.976	-2.121
	(0.209)	(3.371)	(2.374)	(2.401)
Cumulative Drone Strikes	0.008	0.009 *	0.003	0.005
	(0.005)	(0.005)	(0.003)	(0.003)
Economic Aid (Log)		0.039	0.014	-0.049
		(0.182)	(0.127)	(0.167)
Military Aid (Log)		0.062	0.057	0.089 *
		(0.053)	(0.035)	(0.036)
Military Trainees		0.000	-0.000	-0.000
		(0.000)	(0.000)	(0.000)
Lagged Terrorist Attacks			0.025 ***	0.023 ***
			(0.003)	(0.003)
All Channel			1.126 ***	1.203 ***
			(0.276)	(0.269)
Hub and Spoke			3.712 ***	3.245 ***
			(0.540)	(0.542)
Liberal Democracy Score				-1.957
				(2.901)
State Fragility Index				0.121
				(0.072)
Observations	175	175	175	175
R^2 / R^2 adjusted	0.019 / 0.014	0.037 / 0.015	0.578 / 0.560	0.608 / 0.586

** p<0.05 ** p<0.01 *** p<0.001*

All models show no substantive relationship between the cumulative number of drone strikes an organization has experienced and that organization's tactical diversity, as all marginal effects are contextually negligible. This can be visualized in Figure 5.5. A terrorist organization is predicted to add a new tactic for every 125 strikes committed against the organization over time. Never before has the United States launched 125 strikes in a year. Ordered logit and fixed-effects models provide similar results, and those are available in Tables A.2 and A.3.

Figure 5.5: Tactical Diversity by year, Cumulative Drone Strikes (OLS)



Note: Estimate obtained from Model 1, Table 5.9

There is the possibility that the results of the OLS model are driven mostly by the mass of datapoints around the independent variable's lower bound. To account for this effect, observations with less than 25 cumulative strikes were excluded from the regression analysis. The results are available in Table 5.9.

Table 5.9: Tactical Diversity by year, Cumulative Drone Strikes (OLS)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Estimates*	*Estimates*	*Estimates*	*Estimates*
(Intercept)	1.389 (0.842)	4.052 (16.960)	7.177 (13.996)	-15.154 (10.200)
Cumulative Drone Strikes	0.008 (0.009)	0.017 (0.010)	0.012 (0.009)	-0.018 * (0.010)
Economic Aid (Log)		-0.419 (0.877)	-0.522 (0.696)	-0.141 (0.562)
Military Aid (Log)		0.285 (0.182)	0.202 (0.138)	0.150 (0.100)
Military Trainees		0.000 (0.000)	-0.000 (0.000)	-0.000 * (0.000)
Lagged Terrorist Attacks			0.022 *** (0.004)	0.005 (0.004)
All Channel			0.391 (0.870)	1.815 ** (0.788)
Hub and Spoke			2.979 * (1.603)	1.129 (1.369)
Liberal Democracy Score				-0.667 (9.502)
State Fragility Index				1.035 *** (0.242)
Observations	44	44	44	44
R^2 / R^2 adjusted	0.019 / -0.004	0.150 / 0.063	0.593 / 0.514	0.820 / 0.772

** p<0.1 ** p<0.05 *** p<0.01*

Note: Observations filtered for Cumulative Strikes > 25

Model 4 is the only model to provide some amount of significance. With a standard error of .010 on the independent variable, Model 4 is significant at the .1 level, which is not a traditional level of statistical significance. Models 1, 2, and 3 do not even meet the relaxed significance threshold, and they all show a positive relationship between the cumulative number of drone strikes against an organization and that organization's tactical diversity. Model 4, however, indicates there is a negative relationship between the independent and dependent variable: a terrorist organization is expected to drop a tactic from their repertoire for every 55 strikes accumulated against that organization.

Robustness checks were conducted under the filtered conditions as well. However, the ordered logit could not find a proper starting value and was unable to produce results. The results of the fixed-effects regression can be seen in Table A.3. Only the group-level fixed effects regression, Model 2, reaches the untraditional .1 significance threshold. It produces similar results to that of Model 4 in Table 5.9.

Hypothesis 3

Tests for Hypothesis 3 are almost identical to those used to test Hypothesis 1a. OLS models with an increasing number of control variable groups were analyzed. Similar robustness checks — an ordered logit and fixed-effects model — were used to confirm the results. The dependent variable is different, though, and tracks the number of targets an organization attacks in a given year instead of the number of tactics — or attack types — used. As a reminder, a max number of 16 different targets were included in the dataset. The results for the initial OLS regression are shown below in Table 5.10.

Table 5.10: Target Diversity by year (OLS)

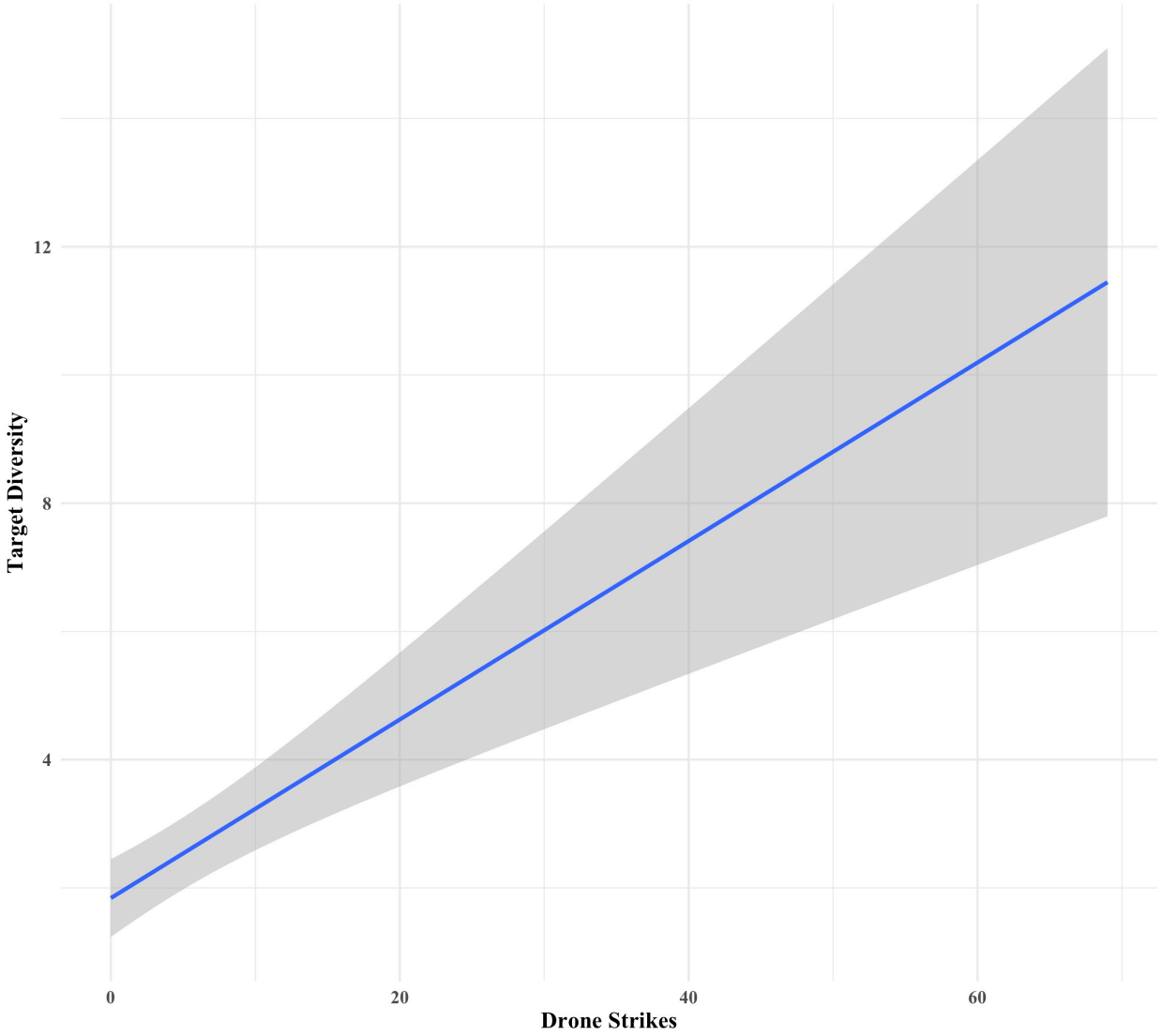
	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Estimates*	*Estimates*	*Estimates*	*Estimates*
(Intercept)	1.841 ***	-2.866	-2.120	-4.773
	(0.307)	(5.199)	(3.466)	(3.478)
Drone Strikes	0.139 ***	0.144 ***	0.059 **	0.064 **
	(0.028)	(0.030)	(0.020)	(0.019)
Economic Aid (Log)		0.189	0.099	0.173
		(0.278)	(0.185)	(0.238)
Military Aid (Log)		0.041	0.033	0.084
		(0.080)	(0.051)	(0.051)
Military Trainees		-0.000	-0.000	-0.000 *
		(0.000)	(0.000)	(0.000)
Lagged Terrorist Attacks			0.047 ***	0.045 ***
			(0.004)	(0.004)
All Channel			1.367 ***	1.469 ***
			(0.402)	(0.389)
Hub and Spoke			4.950 ***	4.255 ***
			(0.784)	(0.784)
Liberal Democracy Score				-7.059
				(4.178)
State Fragility Index				0.094
				(0.102)
Observations	175	175	175	175
R^2 / R^2 adjusted	0.123 / 0.118	0.131 / 0.111	0.661 / 0.647	0.689 / 0.673

** p<0.05 ** p<0.01 *** p<0.001*

Models 1 and 2 show a marginal effect of target diversity almost double that of Models 3 and 4, following the pattern seen in the results of other hypotheses. With a standard error of .028 and .030, the independent variable of Models 1 and 2 reach a significance level of .001, and they both predict that a terrorist organization should target a new group for about every 7 drone

strikes against the organization in a given year. A visualization of this effect is present in Figure 5.6.

Figure 5.6: Target Diversity by year (OLS)



Note: Estimate obtained from Model 1, Table 5.10

The marginal effect of drone strikes is cut in half in Models 3 and 4, which introduce group-level and country-level control variables. At the .01 significance level with standard errors of .02 and .019, respectively, Models 3 and 4 predict a terrorist organization to attack a new target group for every 16 drone strikes against that organization in a year.

Results for the first robustness measure — an ordered logit model — can be seen below in Table 5.11. Models 1 and 2 produce nearly identical results, showing an odds ratio of 1.064 and a significance at the .001 level. However, the odds ratio takes a dip as group-level and country-level controls are included in models 3 and 4. Both models have a standard error of .016, but only Model 4 reaches a significance level of .01

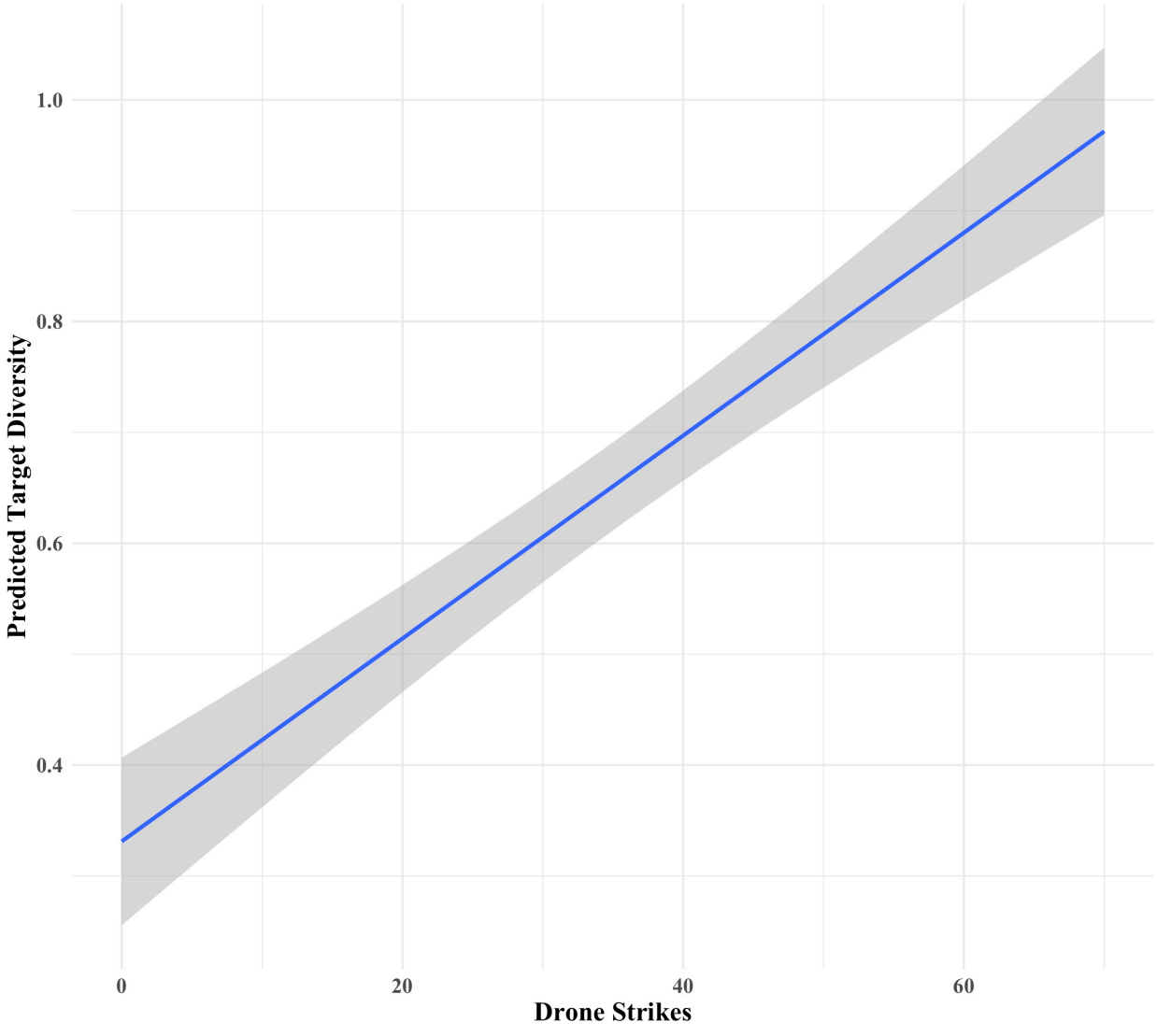
Table 5.11: Target Diversity by year (Ordered Logit)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*
Lagged Drone Strikes	1.064 ***	1.064 ***	1.041 *	1.046 **
	(0.014)	(0.015)	(0.016)	(0.016)
Economic Aid (Log)		1.152	1.279	1.363
		(0.157)	(0.194)	(0.235)
Military Aid (Log)		0.984	0.986	1.038
		(0.039)	(0.041)	(0.043)
Military Trainees (In Hundreds)		1.000	0.998	0.997
		(0.002)	(0.002)	(0.002)
Lagged Terrorist Attacks			1.036 ***	1.033 ***
			(0.007)	(0.006)
All Channel			3.003 **	3.829 ***
			(0.341)	(0.362)
Hub and Spoke			21.293 ***	14.829 ***
			(0.646)	(0.683)
Liberal Democracy Score				0.002
				(3.546)
State Fragility Index				1.062
				(0.089)
Observations	175	175	175	175
R^2 Nagelkerke	0.116	0.120	0.526	0.557
			** p<0.05*	*** p<0.01* **** p<0.001*

Note: R^2 Nagelkerke is the unique R^2 formula used for this regression analysis

As discussed previously, the odds ratios are hard to interpret for ordered logit models. Figure 5.7, show below, provides interpretable expected values for a group's target diversity, holding all controls at their mean and assuming groups are run bureaucratically. The marginal effect of drone strikes is not very substantive according to the ordered logit model, predicting that a terrorist organization only add about .5 targets to the portfolio when moving from no drone strikes to the max amount of drone strikes in a given year.

Figure 5.7: Predicted Target Diversity by year (Ordered Logit)



Note: Estimate obtained from Model 4, Table 5.11

Table 5.12: Target Diversity by year (Fixed Effects)

	Model 1	**Model 2**
Predictors	*Estimates*	*Estimates*
(Intercept)	-20.451 ***	-1.665
	(5.327)	(5.144)
Drone Strikes	0.061 **	0.057 **
	(0.019)	(0.020)
Economic Aid (Log)	1.203 ***	0.122
	(0.246)	(0.242)
Military Aid (Log)	0.027	0.032
	(0.044)	(0.048)
Military Trainees (In Hundreds)	-0.000	-0.000 *
	(0.000)	(0.000)
Liberal Democracy Score	-0.060	
	(4.318)	
State Fragility Index	-0.281 *	
	(0.132)	
AQ Pakistan	-0.578	
	(1.006)	
AQ Somalia	2.522 **	
	(0.865)	
Al-Shabaab Somalia	10.443 ***	
	(0.887)	
AQAP Yemen	5.088 ***	
	(1.174)	
Baitullah Mehsud Faction Pakistan	-1.066	
	(1.068)	
Haqqani Network Afghanistan	0.323	
	(0.725)	
Haqqani Network Pakistan	-1.130	
	(1.078)	

ISIS Afghanistan	5.861 ***	
	(1.152)	
ISIS Pakistan	2.986 *	
	(1.222)	
ISIS Somalia	0.771	
	(1.462)	
ISIS Yemen	1.420	
	(1.364)	
Islamic Movement of Uzbekistan Afghanistan	-0.536	
	(0.803)	
Islamic Movement of Uzbekistan Pakistan	-1.128	
	(1.102)	
Taliban Afghanistan	9.279 ***	
	(0.641)	
Taliban Pakistan	-0.340	
	(1.032)	
Lagged Attacks		0.043 ***
		(0.004)
All Channel		1.534 ***
		(0.384)
Hub and Spoke		5.748 ***
		(0.895)
Pakistan		-1.814 ***
		(0.487)
Somalia		-1.402
		(0.836)
Yemen		0.403
		(0.971)
Observations	175	175
R^2 / R^2 adjusted	0.812 / 0.786	0.708 / 0.690

** p<0.05 ** p<0.01 *** p<0.001*

The fixed-effects models displayed in Table 5.12, confirm the results of both prior models. Model 1's independent variable, which displays group level fixed effects, is significant at the .01 level with a standard error of .019, predicting that terrorists target a new classification for every 53 drone strikes against them in a given year. Model 2 displays similar results as well. Though, the R-squared comparison gives a slight edge in accuracy to the first model. Ultimately, the fixed-effect regression confirms the results of the initial linear regression model but shows a much more limited marginal effect of the drone strike variable, which is in line with the results from Figure 5.7.

Chapter 6

Discussion

Overview of Results

Drone strikes seem to incentivize a terrorist organization to diversify both their attack tactics and attack targets. OLS models indicate, and the robustness checks confirm, a positive relationship between drone strikes and a terrorist organization's tactical and target diversity. These effects are largely independent of time, as shown by the models that employ a lag on the independent variable. The marginal effects, according to the OLS models, are substantial and significant; that is, the models indicate drone strikes are associated with a large enough effect on a terrorist group's diversity to consider the independent variable important understanding the relationship between the two.

As for assessing the effect of drone strikes when terrorist groups have been under the stress of a sustained drone campaign, the models indicate a negative relationship between additional drone strikes and a terrorist group's tactical diversity. Since the results only reach an untraditional level of statistical significance (.1), their robustness is in doubt, however.

The large-N results begin to tell a story. Terrorist organization react to drone strikes by diversifying their tactics and targets. We can begin to hypothesize what this means for organizations internally. As the results largely confirm the strategic logic of violence against civilians, they could indicate the occurrence of one of two scenarios. Either a terrorist organization is maintaining its control over the battlespace through calculated yet harsh retaliations or it is reacting to drones with paranoia and violence against all who may have leaked information to the U.S. government. The character of the quantitative outcomes will be further

investigated in the vignettes of Chapter 7, and, hopefully, they will provide more context for the already insightful empirics.

Implications of Results for Hypothesis 1a

The results from the OLS and robustness models support Hypothesis 1a, which predicts a positive relationship between the number of drone strikes in a given year against a terrorist organization and the tactical diversity of that terrorist organization. The primary model — Model 4 from Table 5.1 — projects a terrorist group to add a new tactic to their repertoire for every 25 drone strikes in a given year.

The ordered logit provides a much less substantial marginal effect for the drone strike coefficient, predicting the maximum number of drone strikes in a given year to only increase the predicted tactical diversity of a targeted group by half a tactic. These results, though, could be driven by the large proportion of cases that do not observe terrorist attacks, biasing the model towards predicting a "no-attack" outcome.

However, the fixed-effects model supports the case for a more reserved marginal effect estimate. Model 1 in Table 5.3 accounts for group-level fixed-effects, which is designed combat endogeneity concerns by accounting for the latent differences across terrorist groups. The model has the highest adjusted R-squared value (.776) of the regressions for Hypothesis 1a and a more reserved estimate, predicting a terrorist organization to add another tactic to their repertoire for every 39 drones strikes conducted against them in a given year.

To place the results in the context of Trump administration, only four of the twenty-four cases in which there was at least one drone strike boasted a yearly drone strike count over the 25-strike threshold calculated by the OLS model. The marginal effect of drone strikes likely exists,

but the administration's use of drone strikes may not be frequent enough to incentivize tactical diversification among terrorist groups.

Implications of Results for Hypothesis 1b

The models with a lag on the independent variable disprove the predictions of Hypothesis 1b, which expects the effect on tactical diversity not to extend beyond the given observation year. The primary OLS models as well as the ordered logits and fixed-effects models, which were used as robustness checks, show a substantial and statistically significant positive relationship between the lagged number of drone strikes against an organization and that organization's tactical diversity.

The primary OLS model predicts a terrorist group should use a new tactic for every 23 attacks against a terrorist organization in the year prior to the dependent variables' observation. The robustness checks support this result. The ordered logits as well as the fixed-effects models provide similarly substantive and statistically significant results. The group-level fixed-effect model, for instance, predicts that a terrorist organization will add a new tactic to its repertoire for every 27 drone strikes in the year prior to observation.

Potentially, the sustained marginal effects across the robustness checks are, in part, due to the latent effect the observation's non-lagged drone strikes. The dependent variable might have already been affected by both the lagged number of drone strikes and the number of drone strikes in the dependent variable's observation year, meaning the impact of two years of a drone campaign are passed off as the marginal effect of the lagged independent variable. The results from Table 5.7 largely support this notion, as the number of drone strikes in a given year appear to be independent of one another. Since a dependent relationship does not appear to exist, the

models with a lagged drone strike independent variable fail to account for this potential effect on the dependent variable. This is in an inherent problem with lagging an independent variable and is an important limitation to be noted.

Implications of Results for Hypothesis 2

There is scant evidence to support the predictions of Hypothesis 2, which expects the cumulative number of drone strikes an organizations experiences to have a negative impact on that group's tactical diversity. The initial OLS models found in Table 5.8 provide a trivially substantial and statistically insignificant positive relationship between the cumulative number of drone strikes an organizations experiences and that group's tactical diversity.

The approach where organizations with under 25 cumulative strikes were filtered from the dataset yields some results. Model 4 from Table 5.9 shows a negative relationship between the cumulative number of drone strikes and the tactical diversity of an organization, predicting a terrorist organization to drop a tactic from their repertoire for every 55 strikes accumulated against that organization.

However, this model did not reach the traditional .05 level of statistical significance. Though there is some relationship in Model 4, the three other OLS models are neither statistically significant nor negatively substantive. The robustness models, which can be found in the Appendix, do not provide additional support for the OLS either. Instead the robustness checks produce similar results to those of the unfiltered model. Among all this evidence, Model 4 seems to be an outlier.

The evidence provided is not strong enough to confidently confirm Hypothesis 2. Drone strikes do not seem to have a debilitative effect on terrorist organizations, even when a drone

campaign has been sustained against the target organization. This complicates the story many drone strike proponents use to support their position. Should terrorist activity and attack lethality—the two traditional markers of the program's effectiveness—decrease because of drone strikes, we would expect to see a group's tactical diversity decrease as well. It is possible that groups attempt to maintain a diverse tactical portfolio at the expense of their attack count and their attacks' success. The results presented so far, though, are likely inconsistent with a negative relationship between the number of drone strikes against an organization and that organization's attack frequency and lethality.

Implications of Results for Hypothesis 3

The empirical results confirm the expectations of Hypothesis 3. Drone strikes are positively associated with the number of different targets a terrorist organization attacks in a given year. The primary OLS model — Model 4 in Table 5.10 — predicts a terrorist organization to attack a new target group for every 16 drone strikes against that organization in a year.

The robustness checks confirm the positive relationship, though the ordered logit model and the group-level fixed-effects model predict a less substantial marginal effect. The group-level fixed-effects model, for instance, predicts that terrorists target a new classification for every 53 drone strikes against them in a given year. The same factors from the discussion of Hypothesis 1a's results influence this discussion. In that vein, the available evidence cautions against whole-heartedly accepting the marginal effect displayed in Model 4 of Table 5.10. Though drone strikes likely increase the number of different targets a terrorist organization attacks, the current yearly usage of drone strikes does not seem to trigger great target diversification among terrorist organizations.

Hypothesis 3 also predicted that many of these attacks will be targeted against the civilian population because there are now incentives to show strength in the face of a new challenger and deter defections. The models displayed in Table A.4 confirm this aspect of the hypothesis. Civilians and religious organizations are more likely to be targeted in a given year as the number of drone strikes against an organization increases. The strategic logic of terrorist violence against civilians properly drives the results of this hypotheses.

Chapter 7

Case Study: AQAP (Yemen, 2012)

Case Selection

The quantitative results highlight the patterns in terrorist organizations' responses to the pressure of a drone strike campaign. Drone campaigns are associated with both target and tactical diversification, but the context of such diversification is still unclear. That is, are these organizations diversifying their operations as a concerted attempt to manage risk and maintain their hold over civilian populations, or are they feeding into the paranoia created by a drone campaign with indiscriminate violence against communities who are feared to have informed on them?

The case of Al-Qaeda in the Arabian Peninsula (AQAP) in 2012 will likely answer these questions. In 2012, Yemen's president, Ali Abdullah Saleh, ceded power to his successor, Abdrabbuh Mansour Hadi.[86] The transition marked a period of instability for the Yemeni government, which had finally had a peaceful transition of power after President Saleh remained in office past the term limit he negotiated with the international community. AQAP wasted little time in welcoming the new President to his post, attacking the presidential palace not long after Hadi's inauguration.[87] These types of attacks had been characteristic of AQAP since its founding on 2009. Locked in a civil war with the Yemeni government, AQAP committed few attacks against civilians. In fact, the organization had decided to embed themselves within the populace as a strategic move to garner long-term legitimacy, marrying women relatives of tribal leaders

[86] "Yemen President Saleh Steps Down." *BBC News*, February 27, 2012, sec. Middle East. https://www.bbc.com/news/world-middle-east-17177720.
[87] "Global Terrorism Database (Data File)" (National Consortium for the Study of Terrorism and Responses to Terrorism (START)., 2019).

and providing social services to communities throughout Yemen.[88] All of this was before the U.S. launched a critical mass of drone strikes against AQAP.

Figure 6.1: Terrorism Trends Across Countries

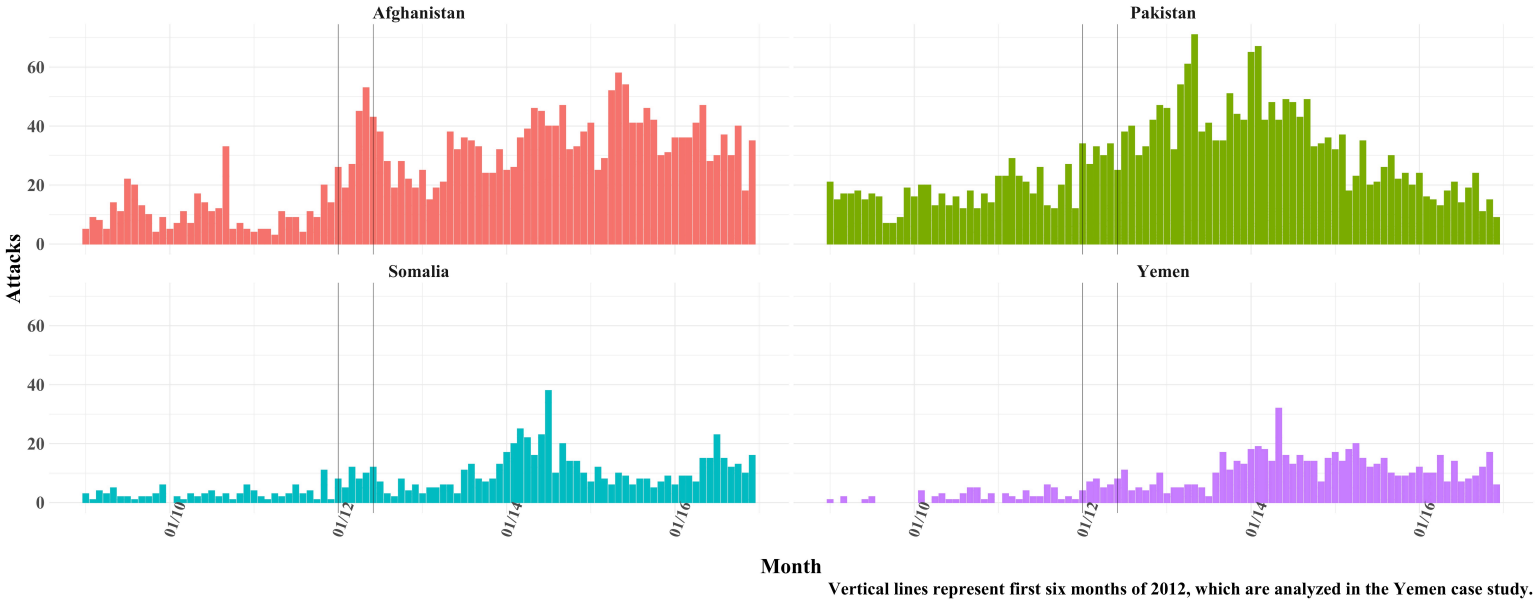
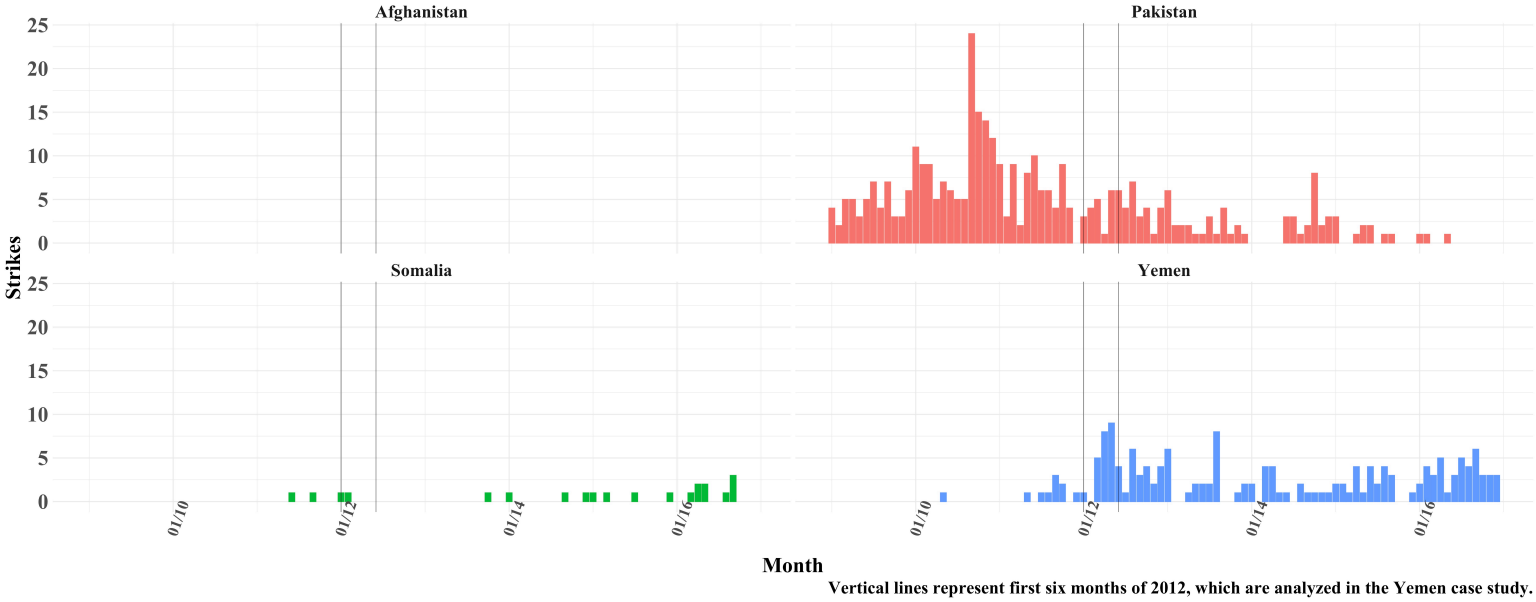


Figure 6.1 identifies terrorism trends in Yemen as well as the other countries included in this thesis's dataset. Yemen and Somalia experience relatively few terrorist attacks in the identified time period compared to Afghanistan and Pakistan. This distinction could be significant, as organizations that are capable of committing more attacks are likely to be able to commit many different types of attacks. The relationship between a group's attack capability and the probability of it becoming a U.S. counter-terror target was previously discussed, and its importance as a potential confounder in quantitative models was noted. Thankfully, the timing of the Yemen drone campaign — at an early peak in AQAP's terrorist activity — tests the central takeaways from the quantitative portion without the concerns of such a confounder. The data indicate AQAP lacked displays of diversification capacity prior to the case study's timeframe.

[88] Jones, Clive. "The Tribes That Bind: Yemen and the Paradox of Political Violence." *Studies in Conflict & Terrorism* 34, no. 12 (December 1, 2011): 902–16. https://doi.org/10.1080/1057610X.2011.621117., p. 910.

Figure 6.2: Drone Trends Across Countries



Shortly after AQAP's spike in consistent activity, the U.S. significantly ramped up the number of drone strikes against the organization. Drone trends — shown in Figure 6.2 — highlight the rarity with which such a tactic occurs. ISIL (Afghanistan, Late 2014) and AQAP (Yemen) appear to be two of the few possible cases where sudden increases in terrorist activity were met with large increases in drone activity. Though, the counter-terror response to ISIL, unlike the response to AQAP, was multilateral, combining ground forces and airstrikes from a broad coalition of military powers. This case stands as a singular opportunity to discuss the impact of drone strikes on a diversifying group.

AQAP prior to the rise of the U.S. drone program in Yemen — a young organization that attacks their government and limits violence against civilian populations — provides fertile ground for assessing whether drone strikes change the composure of an organization during their diversification.

Analysis

President Hadi confronted a growing threat in AQAP when he inherited the Yemeni Presidency in early 2012. AQAP's recruiting numbers were strong, and their operational capacity was displayed when a group of 200 militants overtook Rida, a town of 60,000 people, to facilitate a jailbreak of their captured members.[89] During their ten-day control of the town, there were few civilian casualties. This activity was emblematic of AQAP during this period. Similar operations would net AQAP tens—if not hundreds—of millions of dollars when they raided town banks.[90] Their ability to overwhelm government forces, achieve their well-defined objective, and retreat without any major casualties contributed to the turbulent transition of power in Yemen. News of military success for the government was few and far between before the U.S. ramped up its drone campaign.

In March of 2012, the United States began to supplement Yemeni military activities with drone strikes. They launched eight strikes in March, almost doubling the total number of drone strikes ever launched in Yemen. Twenty-seven more drone strikes would come over the three-month period spanning April, May, and June of 2012. Anywhere from 203–261 militants were eliminated in these strikes, including five upper-echelon leaders.[91] The U.S. drone program was fully engaged with AQAP in the ongoing Yemeni civil war.

The drone campaign immediately affected the organizational structure of AQAP, prompting an expansion of their propaganda department. AQAP produced a flagship report called *Expectations Full*, which was authored by Samir Kahn, the previous editor of the group's

[89] Terrill, W. Andrew. "The Struggle for Yemen and the Challenge of Al-Qaeda in the Arabian Peninsula." Strategic Studies Institute and U.S. Army War College Press, June 2013. https://ssi.armywarcollege.edu/the-struggle-for-yemen-and-the-challenge-of-al-qaeda-in-the-arabian-peninsula/., p. 41.
[90] "Al-Qaeda in the Arabian Peninsula (AQAP)," Counter Extremism Project, accessed February 18, 2020, https://www.counterextremism.com/threat/al-qaeda-arabian-peninsula-aqap.
[91] Bergen, Sterman, and Salyk-Virk, New America, Accessed October 7, 2019.

magazine, *Inspire.*[92] The guide is targeted at western recruits, encouraging them to forgo the "heretical" values instilled by western — and chiefly American — education. They advise the recruits to flee the country and join AQAP abroad or to attack the enemy on their homeland. Media reports even attribute some acts of lone wolf terrorism against the United States to Al-Qaeda and their propaganda machine's influence.[93]

AQAP turned to social media as well, taking advantage of chat rooms, Twitter, YouTube, and other broad-reaching platforms that had not yet learned to censor terrorist recruitment material. When accounts were shut down, AQAP established the infrastructure to immediately repopulate their presence, launching new accounts with nearly identical usernames or identification tags. [94]

AQAP's propaganda expansion reflects a targeted, risk-focused composure for two reasons. First, the pivot to recruiting lone wolves provides another tactical outlet to continue their work against the United States. Internet propaganda only requires an internet connection to be produced. Should AQAP's capabilities be severely limited by Yemeni and American offensives, global outreach serves as a viable last resort to continue their jihad.

Second, propaganda is especially effective against drone strikes, which may kill many civilians. Propaganda arms of AQAP would repeatedly use drones in their recruitment material.[95] As AQAP faced increasing pressure from U.S. drone strikes, their leaders publicly denounced Yemeni leaders as weak, claiming their government would have crumbled if not for the support

[92] "Al-Qaeda in the Arabian Peninsula (AQAP)," Counter Extremism Project
[93] Meleagrou-Hitchens, Alexander, and Peter R. Neumann. "Al Qaeda's Most Dangerous Franchise; It Is from Yemen, Not Tribal Pakistan, That the Group Is Most Likely to Strike America Next." *The Wall Street Journal*, May 10, 2012. http://search.proquest.com/docview/1012098801/B009D6696A9845ADPQ/8?accountid=12861.
[94] ibid.
[95] MacDonald, Myra. "New Jihadi Magazine Appeals for Help against Drones." *Reuters*, May 6, 2013. https://www.reuters.com/article/us-security-magazine-idUSBRE9450M620130506.

of the United States.[96] AQAP's social media savviness worked well during Yemeni offensives and in the aftermath of drone strikes. Misinformation spread via coordinated media posts played off the already rampant distrust of the Yemeni government. The social media tactics overpowered the few accurate journalists reporting facts from remote regions of Yemen, painting AQAP in a more favorable light and undermining the government's rapport with its citizens.[97]

AQAP's social media usage was calculated, positioning their organization on the side of the Yemeni people. So long as AQAP's grip on the tribal communities, and therefore the populace at large, was secure, they limited their violence against civilians. There was little need to deter defections through fear.

In March, April, and May, only eight out of the 66 terrorist attacks perpetrated by AQAP included civilians as a major target.[98] Many civilians were targeted because their behavior did not comply with the strict sharia law enforced by Al-Qaeda. On March 18th, for instance, Joel Shrum, an English teacher from the United States who was working in Yemen, was killed for "spreading Christianity" to Muslim students.[99] Similarly, another private citizen was executed for, reportedly, practicing "sorcery."[100] These attacks are emblematic of AQAP's violence against civilians in the early months of the drone campaign: limited, discriminate, and purposeful.

When AQAP did retaliate against drone strikes, their targets were military bases, police stations, or public utilities. In late March, a U.S. drone strike reportedly killed five Al-Qaeda members. Several days later, AQAP responded by bombing an oil pipeline connected to a

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[96] Terrill, 2013, p. 42
[97] Baron, Adam. "Yemen's Latest, Greatest Threat: Twitter?" *The Christian Science Monitor*. Accessed February 18, 2020. http://search.proquest.com/docview/1520820104/3F117F610B5E4415PQ/2?accountid=12861.
[98] "Global Terrorism Database (Data File)" (National Consortium for the Study of Terrorism and Responses to Terrorism (START)., 2019).
[99] Almasmari, Hakim. "Al Qaeda Claims It Killed American in Yemen." *CNN*, March 20, 2012. https://www.cnn.com/2012/03/18/world/meast/yemen-american-killed/index.html.
[100] Associated Press, "Al-Qaeda Abuses in Yemen Included Beheading Alleged Sorcerer, Crucifying Accused Spy: Report," *The National Post*, December 4, 2012, https://nationalpost.com/news/al-qaeda-abuses-in-yemen-included-beheading-alleged-sorcerer-crucifying-accused-spy-report.

Balhalf liquid natural gas plant. The production from the plant was forced to stop, and AQAP members later texted journalists to claim credit for their attack. They also mentioned drone strikes as the motivation for their retaliation.[101] The pipeline's primary stakeholder was a French gas corporation, so the burden of the attack was largely felt by western powers and the Yemeni government.

Yet, AQAP's strategy began to change as their control over territory broke down in late May of 2012. The first step in Yemen's summer offensive was to buy the support of tribal communities with the logistical and financial support of the United States and Saudi Arabia. Tribal communities have long been willing to accept government money to support military operations, and this government maneuver undermined the tribal bonds that AQAP established. To add to AQAP's loses, the U.S. eliminated one of its senior leaders, Fahd al-Qusa. In quick succession, AQAP was weakened, and the Yemeni government reclaimed an AQAP munitions facility and two major cities.[102]

These significant loses severely altered AQAP's strategic calculus, and the group began to rely on asymmetric terror tactics to save face. Insurgents concealed themselves in urban landscapes while larger forces retreated to their strongholds in more rural areas. Bombings in cities and assassinations of intelligence officers or foreign officials quickly became their go-to tactics.[103]

The elimination of AQAP's leaders prompted a change in their internal succession procedures. Normally, the promotion of a new leader is associated with a social media bombardment. New leaders normally declare their predecessors to be martyrs, commit more

[101] Mukhashaf, Mohammed. "Yemen Gas Pipeline Blown up, Output Halted after Drone Attack." *Reuters*, March 30, 2012. https://www.reuters.com/article/us-yemen-qaeda-drone-idUSBRE82T1E820120330.
[102] Terrill, 2013, p. 46-48
[103] Ibid., p. 50.

attacks, and recruit more members. Yet, AQAP took steps to limit publicity of their members' deaths. They also stopped releasing the names of their new leaders.[104] Captured internal communications define drone strikes as the causal factor in this change, as terrorist leaders feared public statements might make them a priority target. AQAP even invested in motorcycles for their operatives' use to decrease the odds that they were targeted by drone strikes.[105]

AQAP's attacks increasingly targeted civilians: five of the 30 attacks conducted by AQAP during June and July of 2012 were primarily against private citizens.[106] Though assassinations became more popular — nine of AQAP's 30 attacks in June and July were assassinations compared to the eight assassinations AQAP conducted in their 102 attacks from January through May — they were more frequently conducted with explosive devices than with firearms, killing civilians in the process. The change their strategic calculus was highlighted in late May. AQAP launched their deadliest attack in 2012, killing 97 people at a military parade.[107] The effect of these attacks was not lost among civilians. Many mentioned to reporters that they felt AQAP had become more violent. They noticed "a shift in targets for the terrorist group" from earlier in the year.[108] The terrorists recognized their patterns of violence had changed as well, leaving leaflets "apologizing for any harm endured" by civilian populations under their occupation.[109]

Pressure from the U.S. drone campaign incentivized AQAP to expand their target portfolio and to inflict more damage on the United States, but extreme losses from leaders'

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[104] Al-Fatash, Ramadan. "Report: Al-Qaeda Radicals Appoint New Leaders in Southern Yemen." *Tribune Business News*. March 30, 2012. http://search.proquest.com/docview/960396174/7DE2B2FA610C48D4PQ/10?accountid=12861.
[105] Terrill, 2013, p. 51
[106] "Global Terrorism Database (Data File)" (National Consortium for the Study of Terrorism and Responses to Terrorism (START)., 2019).
[107] Ali, Almujahed, and Raghavan Sudarsan. "Blast in Yemeni Capital Underscores Al-Qaeda's Reach." *The Washington Post*, May 22, 2012. http://search.proquest.com/docview/1015054918/E6547F25010840BDPQ/1?accountid=12861.
[108] Kasinof, Laura. "In Yemen, New Leader Faces Threats In the South." *The New York Times*. March 18, 2012. http://search.proquest.com/docview/928777949/fulltext/8DC2F42AC78546F4PQ/9?accountid=12861.
[109] Kasinof, Laura. "Yemen Says Militants Are Driven From 2 Cities." *The New York Times*. June 13, 2012. http://search.proquest.com/docview/1020035759/fulltext/BF625AF924A8480FPQ/7?accountid=12861.

deaths and captured cities forced the group to alter its strategy. They diversified their tactical portfolio to prepare for an asymmetric war rather than a traditional civil war. Diversification occurs with drone strikes, but the amount of damage inflicted by counter-terror measures is important in defining the color of a group's diversification.

Discussion

The resilience of AQAP's strategy to the initial barrage of drone strikes began to fade when the pressure from Yemen's summer ground offensive and U.S. strikes against key leaders reached a "critical mass." This characterization falls in line with the theories from Hypothesis 2 and Hypothesis 3 as well as the empirical results discussed in the prior two chapters. Civilian targets, businesses, and utilities came under fire when AQAP suffered more significant losses in late May.

Diversification occurred in response to the U.S. drone campaign, but the drone campaign was not the sufficient factor. Rather, the Yemeni ground offensive in the summer of 2012 was critical to forcing AQAP's new defensive posture. The empirical results presented in the prior chapters established that many drone strikes against an organization in a given year are required to associate the tool with a substantive effect on a terrorist organization's tactical or target diversity. This is seen in the case of AQAP, as the organization only abandoned the two strategic cornerstones of their fight against Yemen when major cities were surrendered, effective control over great territories was lost, and key leaders were killed. AQAP abandoned their tendency to capture cities and administrate. Their insurgents blended with urban landscapes. Their attacks more openly targeted civilians, and the civilian casualty count in many of the summer 2012

attacks surpassed those of the year's winter months. Possibly, none of these changes would have occurred in the absence of Yemen's ground assault.

The strategic logic of violence holds in the case of AQAP. As the need to deter defections arises, violence against civilians increases. Yet, it is becoming clear that a singularly robust drone strike campaign is required to alone affect the strategic objectives of a terrorist organization. Drone strikes were met with retaliations, but those attacks still meshed with AQAP's strategic paradigm. Pipelines, military outposts, and police stations were all acceptable targets. Explosive attacks on possible informants or civilians in direct response to drone strikes, which normally mark indiscriminate acts of violence to quench paranoia, did not occur until after Yemen's summer offensive.

Broader societal and military conditions impact the effectiveness of the drone program. Echoing the results of Mitakides's dissertation, social services and the hearts-and-minds of the populace played an important role in the conflict between AQAP and Yemen. Payments to tribal leaders were an effective military tactic that aided in recapturing cities from AQAP while degrading the relationships with the local populace that the group tried so hard to establish. Successful counter-terrorism requires more than the elimination of the terrorists. Over the long-term, terrorism can only be thoroughly removed through strategies that reduce a group's ability to win the support of the population. These denial of territory strategies are recounted as one of the positive developments in counter-terrorism strategy to come out of the Obama administration, and their use is likely to continue to increase with future counter-terrorism operations.[110] This is a factor likely missed by my statistical regressions.

[110] Anderson, Kenneth. "Denial of Territory to Terrorist/Insurgent Groups in Counterterrorism Strategy." Lawfare, January 27, 2013. https://www.lawfareblog.com/denial-territory-terroristinsurgent-groups-counterterrorism-strategy.; Mudd, Philip, and Andrew Liepman. "Lessons from the Fifteen-Year Counterterrorism Campaign." *Combating Terrorism Center at West Point* 9, no. 10 (October 25, 2016). https://ctc.usma.edu/lessons-from-the-fifteen-year-counterterrorism-campaign/.

Though the regressions included counter-terrorism controls, they mainly accounted for the United States' monetary contributions in military aid. Money is fungible, and the aid provided by the U.S. — and accounted for in the regression — could have freed the capital for Yemen to launch the summer offensive in the first place. At best, though, the impact of the summer offensive would be measured latently by the regression models. Future analyses should account for denial of territory strategies, such as the one discussed in this case. To do so would require a more granular dataset with a monthly, rather than yearly, timeframe, but the analysis would be quite valuable in assessing the marginal impact of drone strikes on a terrorist organization's tactical diversity.

The case of AQAP in the first half of 2012 demonstrates, in part, the thesis's empirical results in action. Increased pressure from a drone campaign along with other counter-terror strategies contributes to a terrorist group's tactical and target diversification, but the pressure must be substantial to force an organization to diversify. As the organization diversifies, it is quite possible that the organization maintains its composure, morphing solely within the bounds of calculated risk management. This was the case with AQAP in March, April and early May. However, it is also quite possible to force an organization to lose its composure, abandon its initial strategy, and drastically alter its targets and tactics: AQAP in late May, June, and July. How a terrorist organization reacts to drone strikes, and other counter-terror measures, is a function of their ability to withstand increasing strategic losses. If drone strikes can diminish an organization's strategic positions incredibly so, then the organization's structure and tactics will likely change to reflect its revised goals in the face of their limited capacity for victory.

Policy Implications

Terrorist organizations react to drone strikes, but these reactions alone do not determine the effectiveness of the policy. As seen in this case, drone strikes were not the primary factor in forcing AQAP to abandon its administrative territories and increase their attacks against civilians. More pressure was needed, and Yemen's ground forces provided the additional stress.

However, Yemen's security situation did not improve over the long-term. Even during the series of successful military operations in the summer of 2012, there were still concerns over the long-term viability of the Yemen's government.[111] AQAP's tactical portfolio continued to expand following 2012, peaking in 2014 at seven different tactics used. Though drone strikes skyrocketed during that two-year period, AQAP continued to expand. This is not to say that drone strikes were instrumental in AQAPs rise over the two-year period. Rather, the rise of the Houthi rebels, a Shiite political movement, destabilized the government and limited AQAP's ability to project power.[112]

Long-term security conditions were largely dictated by the government's ability to project power. President Obama declared Yemen a counter-terrorism success and a model that ought to be followed in other countries.[113] Many intelligence and security analysts backed the assessment from the Obama administration. Of course, this assessment came before the Yemeni government's capabilities deteriorated.

U.S. counter-terrorism policy cannot rely solely on drones. Drones are an effective tool in eliminating high-value targets, but the civilian casualties they leave in their wake and the legality concerns they foster must be taken into account. Though the debilitative effects of drone strikes are not supported by this thesis's empirical results until country-level controls, group-level

[111] Eva Sohlman, "Al Qaeda in Yemen Pushed Back, but Terrorism Threat Remains Strong," *Current*, no. 550 (February 2013): 11–14.;
[112] Kasinof, Laura, and Evan Hill. "Playing a Double Game in the Fight Against AQAP." *Foreign Policy* (blog), January 21, 2015. https://foreignpolicy.com/2015/01/21/playing-a-double-game-in-the-fight-against-aqap-yemen-saleh-al-qaeda/.
[113] Ibid.

controls, and counter-terrorism-level controls are included in the statistical analyses, the importance of both a government's competency and the broader counter-terrorism strategy at play, as demonstrated by the Yemen case, lends more credence to the final models results. For drone strikes to be considered an effective counter-terrorism strategy, they must be paired with other elements of national power that gain administrative control of territory, improve host government capacity, and win the hearts-and-minds of the local populace.

Chapter 8

Conclusion

This thesis attempts to close a gap in the drone literature, answering *why* and *how* drone strikes succeed or fail as a counter-terrorism tactic. Focusing on the relationship between drone strikes and a terrorist organizations' tactical diversity provides more useful information to policymakers than raw terrorist attack figures may provide alone. Hopefully, the findings presented in this thesis allow U.S. officials to plan for a terrorist group's reaction and adjust their overarching counter-terrorism strategy to improve the security situation of countries abroad and for Americans at home.

Using 175 observations of group-country-year data from Yemen, Afghanistan, Pakistan, and Somalia, linear regression models and their robustness checks, ordered logit models and fixed-effects models, indicate the following three results.

First, drone strikes are associated with an increase in a terrorist organization's attack diversity, confirming the theory presented in Hypothesis 1a. The models support a more reserved estimate of drone strikes' effect on terrorist organizations' tactical diversity, predicting a terrorist organization to add another tactic to their repertoire for every 39 drones strikes conducted against them in a given year. It is important to remember that only four of the 24 cases in which there was at least one drone strike met the more aggressive 25-strike threshold calculated by the OLS model. Drone strikes likely produce a marginal effect on a terrorist organization's tactical diversity, but a sustained campaign is necessary for such an outcome. These effects, contrary to the prediction of Hypothesis 1b, do not appear to be limited to the short-term; lagging the drone strike independent variable produces similar results.

Second, there is weak support for Hypothesis 2, which predicts the cumulative number of drone strikes to be negatively associated with a terrorist organization's tactical diversity, especially so after a group has previously been targeted. The OLS model supports the hypothesis only after all control variables are included in the model. As addressed in the discussion of the quantitative results, this limits the confidence readers should have in the regression. However, the case analysis of Yemen underscored the importance of a broad counter-terrorist strategy that incorporates a country's conditions and a terrorist organization's characteristics into their plans. The qualitative evidence provides more support for Hypothesis 2 and claims that drone strikes can debilitate terrorist organizations over time — even despite organizations' efforts to mitigate the risk of their collapse through diversification.

Third, drone strikes are associated with an increase in a terrorist organization's target diversity, confirming Hypothesis 3. The primary OLS model predicts a terrorist organization to attack a new target group for every 16 drone strikes against that organization in a year, but the robustness checks, again, provide a more conservative assessment for a drone strike's marginal effect. Civilians, religious groups, military assets, and local police are the most likely targets to be attacked as terrorist organizations diversify. This is driven largely by the strategic logic of violence mentioned in the hypothesis section. Terrorist groups are expected to retaliate against state enemies to limit their civilian casualties, save face, and win over the populace. Discriminate attacks against civilians may be necessary to deter defections and halt the flow of information to counter-terrorists. The results speak to this process.

The empirical results help illuminate how terrorist organizations respond to a drone campaign, but they do not provide evidence towards the "success" of drones as a counter-terrorism tool.

The case study of Yemen's AQAP in 2012 helps answer some of the lingering question about the drone program's success, showing whether terrorist groups maintain their composure through adaptation or lash out as their capabilities degrade. AQAP expanded their propaganda network in March, retaliated against police and military forces for successful drone strikes, and limited their attacks against civilians to discriminate attempts to prevent defections and enforce their ideology. As loses mounted in the face of a heightened drone campaign and a Yemeni ground offensive in late May, June, and July of 2012, AQAP abandoned its administrative territories, reduced their leaders' public engagements, and increased the number of indiscriminate attacks against civilians. The evidence from the case study suggests drones can both provoke strategic diversification in a terrorist organization and debilitate the organization should there be enough pressure.

Policymakers should be cautious when considering drones a sufficient solution for terror threats. The success of a drone campaign is contingent upon the strength of the broader counter-terrorism strategy at work. Whether counter-terrorists can win the hearts-and-minds of the country's populace or improve the host country's administrative capacities is crucial to the success of a drone program, a fact demonstrated in both the case of AQAP in 2012 and this thesis's empirical results. U.S. policymakers can use the findings of this thesis to anticipate terrorist groups' reactions to drone and, potentially, broad counter-terrorist campaigns. Protecting civilians, religious, military, and police assets should be prioritized in the midst of a drone campaign, and campaigns should be robust if counter-terrorists wish to largely rely on the tool to debilitate organizations. However, security situations are unlikely to improve in target countries if local governments are unable to maintain administrative control over territories.

Prior to this thesis, the drone literature focused on catch all metrics, such as terrorist attack frequency and terrorist attack lethality, to measure outcomes of drone campaigns. The findings in this thesis demonstrate the benefits of looking at other outcome metrics, mainly tactical diversity, to understand the impact that drones have on terrorist organization. The strategic implications of tactical diversification complicate the relationship between terrorist attack frequency or lethality and success that much of the drone literature has assumed. A decrease in terrorist attack frequency or lethality is not always indicative of a group's declining threat. Beyond these findings' implications for U.S. policymaking, I hope they push the literature's notion of success in counter-terrorism to a more nuanced definition.

Future research should take a more nuanced view of success — one not attached to the often-cursory catch-all outcome metrics of attack frequency and lethality — while employing more advanced statistical and qualitative research methods that can improve upon those of this thesis. Namely, research can account for a confounding factor illuminated by the case study: military offensives. Though this thesis attempts to include other elements of national power in its counter-terrorism controls, they likely do not account for the effect of ground offensives. Such a control variable would need to be coded at a more granular time-level than that of this thesis; monthly or weekly observations may be preferable for analyses that wish to consider this specific confounder.

Ultimately, this work lays the foundation for understanding drones' effect on the tactical diversity of terrorist organizations and for prescribing how the U.S. might effectively use the tool in modern counter-terror operations.

Appendix

Figure A.1: Interplot of Drone Strikes and Lagged Drone Strikes Interaction

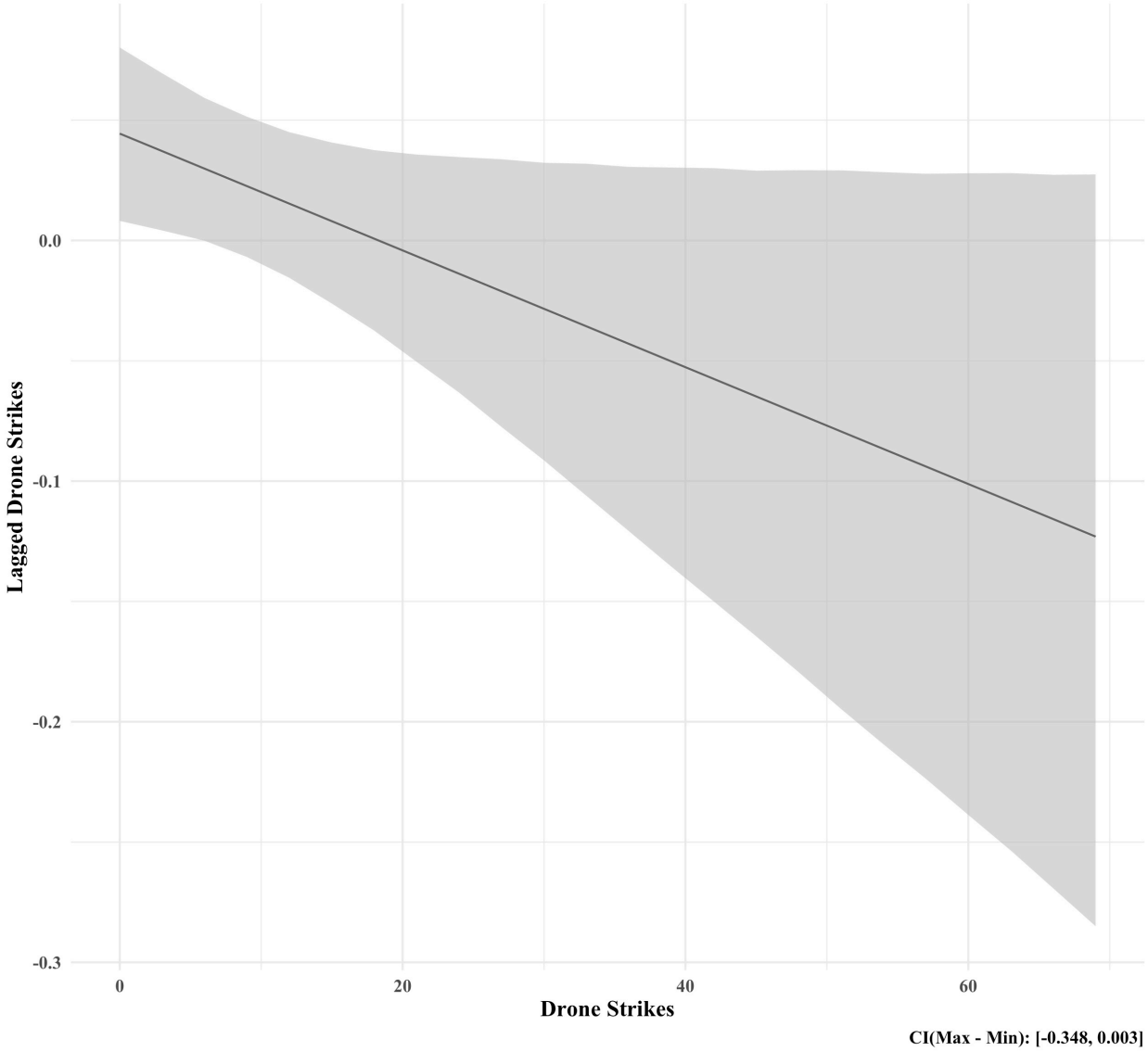

Table A.1: Tactical Diversity by year, Cumulative Strikes (Ordered Logit)

	Model 1	**Model 2**	**Model 3**	**Model 4**
Predictors	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*
Lagged Drone Strikes	1.006	1.005	1.003	1.005
	(0.003)	(0.003)	(0.004)	(0.004)
Economic Aid (Log)		1.123	1.200	1.181
		(0.158)	(0.197)	(0.241)
Military Aid (Log)		1.003	1.019	1.067
		(0.041)	(0.045)	(0.047)
Military Trainees (In Hundreds)		1.001	1.000	0.999
		(0.002)	(0.002)	(0.002)
Lagged Terrorist Attacks			1.024 ***	1.022 ***
			(0.005)	(0.005)
All Channel			3.552 ***	4.432 ***
			(0.348)	(0.368)
Hub and Spoke			31.723 ***	21.551 ***
			(0.663)	(0.680)
Liberal Democracy Score				0.019
				(3.555)
State Fragility Index				1.105
				(0.092)
Observations	175	175	175	175
R^2 Nagelkerke	0.016	0.027	0.453	0.483
		** p<0.05*	*** p<0.01*	**** p<0.001*

Table A.2: Tactical Diversity by year, Cumulative Drone Strikes (Fixed Effects)

	Model 1	**Model 2**
Predictors	*Estimates*	*Estimates*
(Intercept)	-13.439 ***	0.201
	(3.593)	(3.602)
Cumulative Drone Strikes	0.001	0.005
	(0.003)	(0.003)
Economic Aid (Log)	0.612 ***	-0.015
	(0.169)	(0.171)
Military Aid (Log)	0.053	0.060
	(0.029)	(0.034)
Military Trainees (In Hundreds)	-0.000	-0.000
	(0.000)	(0.000)
Liberal Democracy Score	1.941	
	(2.753)	
State Fragility Index	-0.061	
	(0.084)	
AQ Pakistan	0.280	
	(0.668)	
AQ Somalia	1.693 **	
	(0.547)	
Al-Shabaab Somalia	6.991 ***	
	(0.560)	
AQAP Yemen	3.639 ***	
	(0.772)	
Baitullah Mehsud Faction Pakistan	-0.158	
	(0.696)	
Haqqani Network Afghanistan	0.613	
	(0.463)	
Haqqani Network Pakistan	-0.084	
	(0.709)	

ISIS Afghanistan	5.532 ***	
	(0.717)	
ISIS Pakistan	2.817 ***	
	(0.784)	
ISIS Somalia	0.775	
	(0.930)	
ISIS Yemen	1.690	
	(0.861)	
Islamic Movement of Uzbekistan Afghanistan	-0.280	
	(0.512)	
Islamic Movement of Uzbekistan Pakistan	-0.195	
	(0.708)	
Taliban Afghanistan	5.776 ***	
	(0.406)	
Taliban Pakistan	0.827	
	(0.718)	
Lagged Attacks		0.022 ***
		(0.003)
All Channel		1.223 ***
		(0.267)
Hub and Spoke		4.219 ***
		(0.621)
Pakistan		-1.241 ***
		(0.349)
Somalia		-0.970
		(0.577)
Yemen		0.025
		(0.673)
Observations	175	175
R^2 / R^2 adjusted	0.797 / 0.769	0.628 / 0.605

** p<0.05 ** p<0.01 *** p<0.001*

Table A.3: Tactical Diversity by year, Cumulative Drone Strikes (Fixed Effects)

	Model 1	**Model 2**
Predictors	*Estimates*	*Estimates*
(Intercept)	-3.117 (9.369)	-3.162 (10.144)
Cumulative Drone Strikes	0.004 (0.009)	-0.012 * (0.007)
Economic Aid (Log)	0.168 (0.482)	0.285 (0.497)
Military Aid (Log)	0.191 ** (0.071)	0.197 ** (0.073)
Military Trainees (In Hundreds)	-0.000 ** (0.000)	-0.000 *** (0.000)
Liberal Democracy Score	13.054 * (6.862)	
State Fragility Index	-0.516 * (0.288)	
Al-Shabaab Somalia	10.951 *** (1.806)	
AQAP Yemen	8.606 *** (1.531)	
Haqqani Network Pakistan	0.041 (0.452)	
ISIS Afghanistan	9.575 *** (1.366)	
Taliban Afghanistan	10.472 *** (1.363)	
Taliban Pakistan	0.132 (0.664)	
Lagged Attacks		0.002 (0.003)

All Channel		1.204 **
		(0.586)
Pakistan		-6.051 ***
		(0.770)
Yemen		-0.839
		(1.290)
Observations	44	42
R^2 / R^2 adjusted	0.926 / 0.897	0.892 / 0.866

** p<0.1 ** p<0.05 *** p<0.01*

Note: Observations filtered for Cumulative Strikes > 25

Table A.4: Target Type by year (Logit Model)

Predictors	Airport and Aircraft	Business	Educational Insitution	Food and Water Supply	Diplomatic Government	General Government
	Odds Ratios	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*
(Intercept)	0.000 (11.221)	0.003 (7.257)	0.000 (1641.661)	4353053136952.389 (2450.103)	0.000 (8.068)	9.255 (5.364)
Drone Strikes	1.083 ** (0.035)	0.998 (0.047)	0.989 (0.043)	0.978 (0.103)	1.010 (0.027)	0.946 (0.057)
Economic Aid (Log)	0.772 (0.543)	0.520 (0.564)	3.352 (0.783)	0.121 (1.792)	1.258 (0.445)	0.598 (0.348)
Military Aid (Log)	0.961 (0.082)	1.928 * (0.342)	0.979 (0.095)	1.228 (0.227)	1.054 (0.082)	0.986 (0.065)
Military Trainees	14242.075 (9.958)	2.302 (12.707)	0.026 (8.130)	0.000 (20.768)	0.007 (6.357)	2.893 (6.673)

Predictors	Journalists	Military	NGO	Other	Police	Private Citizen or Property
	Odds Ratios	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*
(Intercept)	0.007 (7.165)	0.004 (6.821)	0.000 (1545.352)	0.001 (17.177)	0.068 (7.450)	0.000 (6.073)
Drone Strikes	0.998 (0.032)	1.098 ** (0.046)	0.976 (0.046)	1.040 (0.093)	1.015 (0.043)	1.074 ** (0.032)
Economic Aid (Log)	0.695 (0.433)	1.366 (0.501)	2.648 (0.693)	0.690 (0.930)	1.040 (0.523)	1.437 (0.399)
Military Aid (Log)	1.190 (0.138)	1.318 (0.186)	1.265 (0.163)	1.235 (0.349)	1.145 (0.160)	1.024 (0.071)
Military Trainees	132.619 (8.653)	0.000 * (9.089)	0.000 (8.541)	2975.899 (25.525)	0.000 (8.989)	0.002 (5.699)

Predictors	Religious	Terrorist or Non-State Malitia	Tourists	Unknown	Utilities	Violent Political Party
	Odds Ratios	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*	*Odds Ratios*
(Intercept)	0.000 ** (10.581)	0.000 (10.088)	0.000 (446811.578)	0.000 (10.674)	2.772 (6.387)	0.000 (471836.235)
Drone Strikes	1.104 *** (0.036)	1.250 *** (0.059)	4.339 (1755.543)	1.060 * (0.035)	1.003 (0.035)	0.153 (3791.078)
Economic Aid (Log)	1.673 (0.624)	0.997 (0.487)	0.004 (37645.050)	1.521 (0.631)	0.900 (0.422)	8516671.019 (25156.008)
Military Aid (Log)	1.082 (0.114)	0.967 (0.068)	216.482 (27804.821)	0.985 (0.105)	1.095 (0.137)	16.193 (4222.139)
Military Trainees	0.002 (6.963)	0.000 (6.736)	0.000 (1540816.746)	413.236 (9.690)	0.000 (9.336)	0.000 (250653.114)

R^2 Tjur	Observations	State Fragility Index	Liberal Democracy Score	Hub and Spoke	All Channel	Lagged Terrorist Attacks
0.310	175	1.000 (0.000)	17.642 ** (1.173)	1.298 (1.284)	1.009 * (0.005)	1.470 * (0.211)
0.709	175	1.000 (0.000)	1.445 (1.429)	1.585 (0.901)	1.128 *** (0.034)	1.114 (0.265)
0.444	175	1.000 (0.000)	482857878.697 (1641.605)	101320274.197 (1641.604)	1.014 *** (0.005)	1.086 (0.211)
0.407	175	1.000 (0.000)	5256126106477 .277 (2449.917)	4104887956905 .262 (2449.923)	1.033 * (0.017)	0.387 * (0.535)
0.278	175	1.000 (0.000)	8.712 ** (1.035)	3.720 * (0.752)	1.010 ** (0.004)	1.210 (0.157)
0.711	175	1.000 (0.000)	0.825 (1.501)	4.486 ** (0.752)	1.496 *** (0.114)	1.311 (0.172)
0.231	175	1.000 (0.000)	20.786 *** (1.086)	2.694 (0.803)	1.006 (0.004)	1.262 (0.173)
0.658	175	1.000 (0.000)	41.516 * (2.196)	2.531 (0.631)	1.311 *** (0.091)	0.726 (0.263)
0.493	175	1.000 (0.000)	996014187.265 (1545.293)	158303736.925 (1545.293)	1.010 * (0.006)	1.221 (0.217)
0.093	175	0.995 (0.005)	0.000 (4586.808)	0.238 (3.775)	1.023 (0.018)	1.313 (0.469)
0.701	175	1.000 (0.000)	0.432 (2.443)	6.439 ** (0.758)	1.401 *** (0.099)	0.861 (0.264)
0.535	175	1.000 (0.000)	38.010 ** (1.515)	3.658 ** (0.516)	1.079 *** (0.029)	1.006 (0.160)
0.434	175	1.000 ** (0.000)	24.951 ** (1.631)	75.656 *** (1.511)	1.015 ** (0.006)	1.215 (0.200)
0.598	175	1.000 (0.000)	4.606 (1.025)	1.952 (0.986)	1.018 *** (0.006)	1.438 * (0.198)
1.000	175	0.998 (2.878)	6.909 (115752.376)	0.000 (66224.763)	0.732 (960.493)	3.720 (29775.923)
0.530	175	1.000 ** (0.000)	16.432 ** (1.426)	1.526 (0.811)	1.043 *** (0.014)	1.063 (0.224)
0.250	175	1.000 (0.000)	0.491 (1.266)	0.612 (1.141)	1.021 *** (0.006)	0.923 (0.230)
1.000	175	0.942 (26.090)	0.000 (204060.026)	0.000 (217210.924)	4.328 (996.476)	18.051 (4429.388)

** p<0.1   ** p<0.05   *** p<0.01*