

Assessing Border Walls' Varied Impacts on Terrorist Group Diffusion

Andrew S. Rosenberg* and Nazli Avdan†

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Abstract

Do border walls inhibit the spread of transnational terrorism? Previous research has primarily measured the volume of terrorism without explicitly modeling its diffusion or considering how walls might affect different groups differently. To address these oversights, the study adopts a network-based approach, analyzing the impact of border walls on the spread of violence among 63 extremist organizations from 1970 to 2017. The findings show that barriers generally inhibit diffusion, but their effectiveness varies significantly among groups. This research challenges policymakers who regard walls as a catch-all solution for terrorism, offering a fresh perspective on whether walls' effects justify their cost.

*Department of Political Science, University of Florida. E-mail: andrewrosenberg@ufl.edu

†Department of Political Science, University of Kansas. E-mail: n716a235@ku.edu

Introduction

The proliferation of border walls is old news to international security scholars (Avdan and Gelpi 2017; Brown 2010; Carter and Poast 2020). As of 2021, the number of border walls has risen to seventy-five, and their construction has proliferated since the start of the so-called European migration crisis in 2015 (Tinti and Reitano 2018).

While much ado has been made about the contemporary global increase in wall construction, states have long used walls to provide security in conventional interstate conflicts (Sterling 2009). For instance, France used the Maginot Line unsuccessfully to repel the German armies in 1940, while Israel's Bar Liev Line consolidated its control over Sinai Peninsula after its victory in the 1967 war. Other examples abound, dating from the ancient world through the twentieth century.

In the contemporary era, border walls have been recast as tools to ward off non-state threats (Avdan and Gelpi 2017; Carter and Poast 2017; Hassner and Wittenberg 2015). Politicians have also specifically touted walls as effective counterterrorism tools and cited militancy as the rationale for walling off their borders. Turkey began construction on a wall across its borders with Syria and Iran in 2015 and 2021, respectively, citing PKK training camps as their *raison d'être*.¹ In other cases, states erect barriers to blunt militancy in general, as Pakistan did in 2006 to thwart entry of militants from Afghanistan. And threats do not need to be real or imminent for leaders to use them to warrant border fortification. The Trump administration notoriously pushed for a wall on the U.S.-Mexico border, going so far as to claim, without evidence, that “nearly 4,000 known or suspected terrorists come into our country illegally.”² In these cases, many leaders and citizens presume that building a border wall will alleviate these fears. Given this conventional wisdom, we ask: do border walls actually prevent the spread of transnational terrorism?

To be sure, we are not the first to pose this question. While a handful of studies provide cautious evidence that walls do mitigate flows of violence, the empirical literature is not discerning. For instance, Avdan and Gelpi (2017) show that fenced borders lower the volume of transnational terror-

1. <https://www.dailysabah.com/politics/war-on-terror/security-wall-on-turkey-iran-border-almost-complete>

2. <https://www.nytimes.com/2019/01/08/us/politics/trump-border-wall-terrorists.html>

ism among contiguous dyads. While Linebarger and Braithwaite (2020) find the beneficent effects are conditional on favorable terrain, Carter and Ying (2021) dispute walls' reductive effects on violence altogether.

These countervailing findings reveal that the debate is far from resolved. While this literature provides rich evidence for or against the putative effect of walls on terrorism, it is limited in several ways. First, scholarship considers the impact of walls on the volume and frequency of terrorism, but not on the transnational spread of terrorism. Second, and related, scholars have not isolated the effect of walls on specific terrorist groups. Groups have different capabilities, strategies, and tactics, which suggest that walls should have heterogeneous effects. Linebarger and Braithwaite (2020)'s recent study is a pioneer in focusing on diffusion, but its unit of analysis is the directed dyad. Therefore, it does not model the spread of particular militant groups across borders. And it is confined to viewing diffusion across a pair of states, rather than within a network. This oversight is important because while fences may prevent the diffusion of some terrorist groups, they may inadvertently *facilitate* the spread of others.

Below, we explicitly model the transnational diffusion of terrorism. We argue that while walls lock groups in and damage their ability to spread across countries, they do not prevent the diffusion of older, more capable groups with a significant transnational presence. This heterogeneity has important implications for the diffusion and contagion of violence. Specifically, this paper makes three contributions. First, we operationalize and conceptualize diffusion as the sequential "adoption" of terrorist groups across contiguous borders. Second, we shift focus from the directed dyad to the group level and ask whether a border fence inhibits the spread of a particular group to contiguous territories. Third, we define the network of operation for a group by identifying the subset of countries where the group has established a base and where it has executed attacks, and all states contiguous to this subset. By doing so, we can study whether border fences prevent the diffusion of a specific group within its "politically relevant" network of states. Finally, we reveal the conflicting "prevention" and "backlash" effects of border walls, which further complicate leaders' decisions on whether to advocate for their construction.

This approach allows us to probe whether fences lock groups in by damaging their network. We track the diffusion of violence by 63 organizations across five continents (North America, South America, Africa, Europe, and Asia), from 1970 to 2017. We choose transnational groups, as well as those with contiguous networks that include at least one border fence in this time period. This sampling choice accommodates ideological and regional heterogeneity across groups. We find that while barriers impose overall reductive effects on the spread of violence, the effects are heterogeneous across group-years.

Do Border Walls Impede the Diffusion of Terrorism?

Conventional wisdom—particularly among policymakers and laypersons—holds that border walls prevent the spread of terrorism. In theory, walls impose several logistical barriers on the diffusion of terrorism. We specifically expect them to constrain the operation of terrorist groups to domestic theaters and roll back, and even unravel, their transnational mobilization.

Barriers significantly impede the cross-border movement of personnel and materials, challenging groups' operational capacity. Blair (2023) notes that walls directly obstruct mobilization efforts and, as a consequence, hinder transnational operations. These barriers not only increase the costs related to revenue generation and recruitment but also amplify operational risks. In response, groups may shift their activities to areas more vulnerable to state interception (Avdan and Gelpi 2017). Furthermore, political geographers argue that barriers push individuals into harsher terrains and indirect routes, potentially leading to higher mortality rates (Tinti and Reitano 2018; Chambers et al. 2021). While these observations mainly focus on migration, they hint that groups could face increased losses, from detainment to environmental hazards.

A second mechanism proposes that barriers directly limit groups' ability to conduct cross-border attacks, acting as a denial-of-access measure that complicates militants' infiltration efforts into neighboring territories for assaults (Avdan and Gelpi 2017). This heightened security increases the chances of state forces apprehending militants or disrupting their strategic plans. Consequently, these barriers not only hinder the groups' ability to mobilize resources but also significantly reduce their capacity

to initiate violence.

Third, border walls reduce militant groups' territorial control, a critical factor for their strength given the significant power imbalances with states (De la Calle and Sánchez-Cuenca 2012). Territorial control also indirectly influences access to resources (Asal, Rethemeyer, and Schoon 2019; Avdan and Omelicheva 2021). Fortifications compromise this dominance, necessitate operational shifts, and increase interception chances by authorities, thereby disrupting engagement in lucrative illicit markets (Blair 2023).

Fourth, barriers hinder militant groups' capacity to sustain multiple operational bases across borders. Having bases in countries characterized by state fragility, corruption, and weak law enforcement provides a tactical edge, allowing groups to "venue shop" for optimal attack locations or to exploit vulnerabilities for violence (Gaibulloev 2015; Gaibulloev and Sandler 2021). Walls limit this strategic flexibility, confining their operational scope.

Walls also disrupt militant groups' transnational networks by severing their links to external support, which is essential for their revenue and sponsorship (Byman 2005; Jones 2017). This support includes access to safe havens, crucial for transnational militancy (Salehyan, Gleditsch, and Cunningham 2011), making cross-border sanctuaries less accessible. Furthermore, barriers obstruct the flow of foreign fighters, who contribute new skills and tactical knowledge (Chu and Braithwaite 2017; Malet 2013). Thus, by limiting access to both sanctuaries and foreign fighters, walls curtail the groups' ability to operate beyond their national borders.

This discussion suggests the following hypothesis:

Hypothesis 1 (H₁). *Border walls reduce the transnational diffusion of terrorist attacks.*

The Heterogeneous Effects of Walls

Other cross-disciplinary scholarship questions the efficacy of border walls in curbing transnational terrorism and broader cross-border movements. Contrary to common expectations, Carter and Ying (2021) apply an economic gravity model to reveal that walls may not effectively block the movement of terrorism. Further research suggests that any observed effectiveness is conditional (Linebarger

and Braithwaite 2020) or confined to specific national contexts (Blair 2023). Beyond terrorism, a wider body of literature highlights the impracticality of completely fencing borders due to challenging terrain (Sterling 2009; Cannon 2016; Blair 2023) and the adaptability of various actors—including irregular migrants, smugglers, and militants—who often bypass controls through unmonitored, vulnerable sections of the border (Getmanski, Grossman, and Wright 2019; Carling 2007; Felbab-Brown 2017). These findings underscore the limitations of physical barriers in attenuating transnational movement, pointing to the need for multifaceted strategies that consider the diverse motivations and tactics of those attempting to cross borders.

The effectiveness of walls in countering terrorism spread is further complicated by the inherent diversity among terrorist groups.(Asal, Rethemeyer, and Schoon 2019; Hou, Gaibulloev, and Sandler 2020). For example, larger and more resourceful groups are often better equipped to overcome logistical hurdles. Organizations with transnational operations and a history of foreign attacks are also likely more adept at circumventing such barriers (Gaibulloev and Sandler 2021). In contrast, groups that rely heavily on foreign fighters and external support may find their operations more significantly hampered by fortified borders (Blair 2023).

Contradictory empirical findings in the literature may also stem from the heterogeneous motivations for terrorist diffusion. These diverse motivations, ranging from geographic proximity (LaFree, Xie, and Matanock 2018) to forced displacement, underscore the complex challenge border walls present to counterterrorism strategies. For example, the Lashkar-e-Jhangvi (LeJ) was compelled to relocate to Afghanistan after being banned in Pakistan, while the Islamic Movement of Uzbekistan (IMU) sought refuge in other Central Asian states following expulsion from Uzbekistan. Furthermore, internal constraints or threats within their home countries might also drive these groups to extend their operations abroad (Asal, Conrad, and White 2014). This complexity in motivations reveals why physical barriers may not uniformly impact the diffusion of terrorist activities, highlighting the need for nuanced approaches in counterterrorism efforts.

However, strategic considerations often dictate the internationalization of terrorist campaigns. Factors such as proximity, wealth, and democratic governance serve as magnets (Gelpi and Avdan

2018; Krieger and Meierrieks 2011). Terrorists may target affluent democracies to exploit freedoms of press and movement, enhancing their visibility and recruitment (Asal and Hoffman 2016). Establishing bases abroad also bolsters their logistical capabilities (Hou, Gaibulloev, and Sandler 2020).

In the model posited by Bapat (2007), groups use neighboring territories as sanctuaries, leveraging violence as a bargaining tool against target states. For instance, Lashkar-e-Taiba (LeT) operates against India from Pakistan and Afghanistan. Alliances, such as those between LeT and the Afghan Taliban or the IMU and ISIS, underscore the strategic depth of transnational operations, enabling groups to extend their influence across regions.

Given these insights, it is apparent that barriers' effectiveness in curbing the diffusion of terrorism is contingent upon the specific motivations and strategies of terrorist groups. While some are propelled by strategic objectives or state sponsorship, making them more resilient against physical barriers, others may find their operations significantly constrained.

Moreover, the impact of barriers can vary depending on a group's formation relative to the construction of a wall. Newer groups might struggle more with circumventing barriers compared to those with established networks and knowledge of the terrain. Thus, the age of a group, along with factors like size and capabilities, plays a role in the varied impact walls have on different organizations.

The relevance of border walls also shifts depending on how groups recruit. Walls might be less significant for groups that can recruit via air travel, adding another layer to the varied impacts of such barriers. Groups depending on land crossings for recruitment are more affected by walls than those recruiting locally or through air travel. However, it's common for foreign fighters to use a mix of air and land routes to join militant groups, exemplified by Western ISIS recruits who typically flew to Turkey before crossing into Syria and Iraq by land.

Finally, border walls may also signal that a country is tightening its air travel rules.³ Walls may either have no independent effect on diffusion because they are bundled with other measures (Schon and Leblang 2021) or other measures may moderate their effect (Hassner and Wittenberg 2015). Similarly, factors such as terrain, economic development, and international cooperation in border surveil-

3. We thank an anonymous reviewer for pointing out this possibility.

lance can influence the effectiveness of barriers, underscoring the multifaceted nature of counterterrorism strategies.

The preceding discussion indicates that walls may not effectively curb the spread of transnational terrorism. Furthermore, it suggests that walls could have varying impacts on terrorist groups with distinct characteristics. Based on these insights, we propose the following conditional hypotheses:

Hypothesis 2 (H₂). *Border walls prevent the spread of smaller groups that are less capable, less transnational, and more dependent on foreign fighters.*

Hypothesis 3 (H₃). *Border walls prevent the spread of younger groups.*

Analysis

Existing studies on the diffusion of terrorism adopt a dyadic perspective, a notable oversight considering many terrorist groups operate across multiple states. This limitation becomes apparent in the context of Turkey's 2015 fence construction along its Syrian border, intended to curtail smuggling and militant infiltration.⁴ Previous studies, such as those assessing the Turkey-Syria fence's impact on diffusion, measure transnational terrorism based on attacks by Syrian nationals in Turkey (Avdan and Gelpi 2017), or they assess barriers' efficacy in preventing *inflows* of militancy (Linebarger and Braithwaite 2020), thereby neglecting the dynamics of *outflows* from the wall-constructing state.

Evidence from the Extended Dataset of Terrorist Groups (EDTG) indicates that around 18% of terrorist groups establish operational bases across multiple countries (Hou, Gaibulloev, and Sandler 2020; Gaibulloev and Sandler 2021), suggesting that dyadic analyses fail to account for the complexity of these groups' transnational activities. The ability of terrorist groups to operate beyond a single state's borders underlines the inefficacy of dyadic models to capture their capacity to evade surveillance and exploit porous borders.

We move beyond this dyadic model for two further reasons. First, no group-level data exist at the directed-dyad level, preventing existing approaches from examining group-level heterogeneity.

4. <https://www.aa.com.tr/en/turkey/turkey-building-concrete-wall-on-its-syrian-border/16792>

To create such a dataset from available sources, one would need to assume either that all groups flow from one of the group's bases to a given state where they commit an attack, or that groups sequentially move from state to state. Both assumptions are unrealistic. Second, a dyadic analysis presumes that a border wall only affects the direct flow of violence from state A to state B. However, groups may move across several borders in a given year, and dyadic models cannot capture the effect of a border wall on these more circuitous movements.

Instead, to analyze the impact of border walls on the diffusion of terrorist groups, we employ methods from network theory traditionally used to study the spread of innovations (Valente and Vega Yon 2020). This network approach allows us to estimate the effect of walls on diffusion not only on average, but also on a group-by-group basis, appreciating the heterogeneous effects walls may have across different groups.

Specifically, we conceptualize diffusion as the *occurrence* of violence by a specific terrorist group in a new state, marking a clear departure from the emphasis on the emergence of new groups (Linebarger and Braithwaite 2020). We assume that the occurrence of an attack is a reasonable indicator of the group's operational presence in the state. Attacks represent the culmination of planning, resource allocation, and logistical coordination, all of which can be disrupted by physical barriers. In contrast, establishing bases might involve covert activities less directly affected by border fences. This focus on attacks captures the actual operational activities of terrorist groups and better reflects the barriers' effects on their movements. We identify each group's network as its original base countries of operation—according to the EDTG—alongside countries where the group has executed attacks and all neighboring countries. This network represents the potential geographic expanse for the group's activities. These “bases of operation” are outposts where the group trains, recruits, and conducts other logistical tasks, and not necessarily where it launches attacks.

Accordingly, this analysis is *monadic*. It considers the spread of terrorist groups to specific countries, rather than the flow of total terrorism between countries. Importantly, it avoids both of the issues with dyadic analyses. It assumes the agnostic spread of groups within a politically relevant network of countries, circumventing the availability of data, and it makes no strong assumptions

about how groups move.

Considering the timing of diffusion is also critical. Groups often rely on cross-border networks to funnel fighters and materiel into new states, and the timing of these movements can vary significantly. A group may establish a base long before launching an attack, complicating the ability to measure diffusion based on base formation alone accurately. To illustrate this point, consider the case of the Islamic Movement of Uzbekistan (IMU). The group was first established in 1998 in Tajikistan, according to the EDTG and Stanford's Mapping Militant Organizations (MMO). The EDTG lists the IMU's bases of operation as: Afghanistan, Iran, Kazakhstan, Tajikistan, Kyrgyzstan, Pakistan, and Uzbekistan. The MMO is unclear on when each base was established but specifies that it formed bases in these countries after initially setting up operations in Tajikistan. The EDTG, nonetheless, lists all these states as its bases as of 1998.

Importantly, however, the first known attack is not even in its primary and initial base, Tajikistan, but instead in Uzbekistan in 1999 according to the MMO (an unverified claim of credit) or in 2000 in Kyrgyzstan, according to the GTD. The group did not conduct attacks in Tajikistan until 2000, two years after the creation of its base of operations in the country. If we assume based on the EDTG that the IMU set up bases in 1998 in all seven states, it took a year to carry out an attack in Uzbekistan (though the GTD does not include this as a verified attack by the IMU), and two years to carry out one in Kyrgyzstan.

This example shows that even when a group has established bases in multiple countries, there can be significant delays before attacks occur, reinforcing that an attack is a more reliable indicator of operational diffusion than the establishment of a base.

Despite these timing issues, the IMU case justifies our focus on attacks to study diffusion. By observing where and when attacks occur, we can more accurately capture the operational impact of border fences. Since attacks culminate substantial logistical and operational efforts, they provide a clearer indicator of a group's operational presence and activities. This is essential for evaluating whether border fences effectively limit the diffusion of terrorism.

This analysis proceeds in several steps. First, we use the Global Terrorism Database (GTD) to

select our universe of terrorist groups and create our final data set. We begin with all groups that committed attacks in at least two countries because fences cannot affect groups with a presence in only one country. We are left with 97 groups from 1970 to 2016 after this first step.

Second, we create a diffusion network for each group. We define a terrorist group's network as its original base of operations, the countries where it commits attacks throughout its existence, and all countries contiguous to these states. This approach allows us to study the effect of border walls on the diffusion of specific groups while including only the relevant countries.⁵ Including irrelevant countries would bias our analysis toward finding that border walls work. For example, we would wrongly infer that the border wall between the U.S. and Mexico has prevented the spread of the Islamic Movement of Uzbekistan to the U.S., even though the IMU had no intention of doing so.

This method gives us the network of contiguous states through which the group diffused and for which a border fence could plausibly have an effect. We exclude groups with diffusion networks that do not include at least one border fence during any period. Our final dataset includes 63 groups. Figure 1 shows the geographic distribution of the groups' original bases of operation according to the GTD. Our dataset includes groups from five continents—North America, South America, Europe, Africa, and Asia—allowing for a general analysis that is not limited to a specific region or time period. The list of groups is available in appendix table A2.

Third, we create a time-series edge list that begins at the year the group was established and ends at the year of its most recent attack. For each country in this edge list, we denote the year the group at hand diffused. This gives us a dynamic network data set that captures the diffusion of a given terrorist group over time.

Fourth, we transform this dynamic network into a monadic, time-series data set. This data set records whether the terrorist group diffuses to a country in a given year, as well as other covariates of interest, including whether the country has a border fence. Table 1 shows a truncated example of the PKK data for Syria. Finally, we use this data set to test the effect of a border fence on the probability that a given group diffused to a given country.

5. This strategy is analogous to the concept of "politically relevant" dyads.

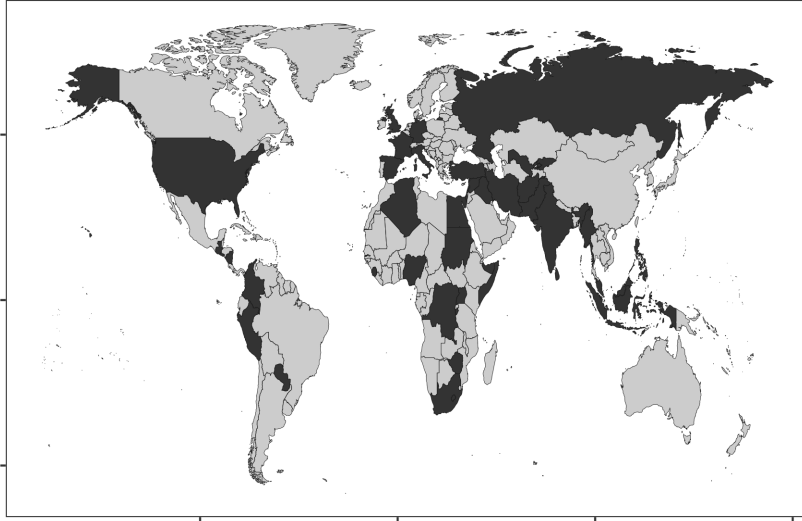


Figure 1: Geographic distribution of terrorist groups in our analysis. The countries shaded in black contain the primary base of at least one group while the countries shaded in white contain no groups.

Country	Year	Diffused	Fenced
SYR	1994	0	0
SYR	1995	0	0
SYR	1996	0	0
SYR	1997	0	0
SYR	1998	1	0

Table 1: A truncated example of the PKK diffusion data for Syria

Main Variable Definitions

The dependent variable in this analysis measures whether a given terrorist group diffused to a given country in a given year. To create this measure, we rely on the GTD, which provides information on domestic and international terrorist attacks since 1970. Each row in this database corresponds to a single attack that occurs in a given state. We subset this database to include only the attacks perpetrated by a group in our sample and use information about their earliest, latest, and intermittent attacks to measure diffusion over time. Recall that in a given year, we cannot be certain how a group diffused into a new state, we can only know the states in which the group had committed attacks in the previous year. As a result, this measure of diffusion captures the *agnostic spread* of a terrorist group over time, rather than the specific, dyadic spread from one country to another.

The main independent variable of interest is whether a given state has built a border wall in a given year against any of its neighbors. These data are derived primarily from the replication data of Avdan and Gelpi (2017) and encompass all border walls built from 1945 to 2007. We extend the study's dataset of border barriers to 2017. To do so, we relied upon several sources, including the World Population Review's list of countries with border walls,⁶ Wikipedia's list of updated border walls,⁷ and the Transnational Institute's report for border barriers within the European Union and Schengen zone (Benedicto and Brunet 2018). Additionally, we cross-checked our updated list of border barriers with scholarly pieces that have recently assembled and examined data on border barriers (Carter and Poast 2020; Linebarger and Braithwaite 2020).

Our augmented dataset covers all border barriers from 1945 until 2017, for all states in the international system, as defined by the Correlates of War (COW) state membership dataset (Correlates of War Project 2017). That is, the data records the building and target state of border barriers, the year that construction began; and, for defunct barriers, the year that the barrier was dismantled. The Avdan and Gelpi (2017) data that we build upon is directed-dyadic. In this analysis, we are concerned with whether a given group is less likely to diffuse into a country that has fenced any of its borders; accordingly, we convert the dataset into monadic format. We do so by coding 1 where a state is the builder of a wall on any of its frontiers and 0 otherwise.⁸ As well, the dataset lends information on the year the barrier was constructed. This binary approach is standard in the published literature on the effects of border walls (see e.g., Avdan and Gelpi 2017; Carter and Poast 2020; Hassner and Wittenberg 2015; Linebarger and Braithwaite 2020).

Other Variable Definitions

We include several other control variables in this analysis.⁹ First, we control for each country's exposure to adoption over time because extant work reveals its importance to many diffusion processes

6. <https://worldpopulationreview.com/country-rankings/countries-with-border-walls>

7. https://en.wikipedia.org/wiki/Border_barrier#List_of_current_barriers

8. Thus, the monadic version would not code 1 where a country is only the target of a wall built by a neighbor but has not fenced off any of its borders (e.g., Mexico).

9. Descriptive statistics for all variables used in this analysis are in Appendix table A1.

(Valente and Vega Yon 2020). This variable measures the proportion of a country's immediate neighbors that were exposed to a given terrorist group in the previous year. We argue that countries with previously exposed neighbors are both more likely to build a border wall and experience a terrorist attack by that group.

Second, terrorist groups are not islands unto themselves. Recent work shows that roughly 50 percent of groups form alliances with others (Phillips 2019, 997), and these alliances affect the lethality of attacks from core groups (Horowitz and Potter 2014). Using the same logic, this cooperation increases both the likelihood that a state will construct a border fence—due to the enhanced risk of attacks by allied groups—and the probability that a given group will diffuse to a new state—due to help from an ally. To measure this cooperation, we use new data from the Militant Group Alliances and Relationships (MGAR) data set, which describes roughly 6,000 cooperative relationships among 2,316 groups from 1950 to 2016 (Blair et al. 2022, 165). Specifically, we include the number of allies a given group has in the state to which it intends to diffuse.

Third, we expect that countries that receive refugee flows are also more likely to build border walls. Milton, Spencer, and Findley (2013) find that international refugee flows increase the likelihood a state experiences a terrorist attack. And perceptions surrounding this association drive leaders to push for border wall construction because of the political cache they provide (Linebarger and Braithwaite 2022).

Fourth, states also build walls to alleviate the consequences of transnational violence (Carter and Poast 2017). Although scholars dispute walls' efficacy in preventing the spread of violence (Carter and Ying 2021; Hassner and Wittenberg 2015; Salehyan 2009), we include this factor because violence remains an important aspect of states' wall-building calculus. We use the Gibler-Miller-Little Militarized Interstate Dispute (MID) data, a revision of the Correlates of War MID data set, to account for whether a given country is involved in an ongoing MID (Gibler, Miller, and Little 2016). Similarly, we control for a state's peace years—the number of years since a state's last MID initiation—because states experiencing longer spells of peace are less likely to build walls. We also include a measure of a country's national material capabilities (CINC score). States with greater material capabilities are

more likely to build successful fortifications and stave off the diffusion of terrorist groups.

Fifth, although existing literature provides countervailing evidence of the effect of economic conditions on terrorism, we control for a state's per-capita GDP in levels. Many assume that poverty increases susceptibility to terrorism because it often arises out of desperation and insufficient state capacity to stem new terrorist threats. While, the evidence linking economic development and the transmission of terrorism remains mixed (Burgoon 2006; Hendrix and Young 2014; Piazza 2011), we suppose that richer countries are more likely to build border walls because they possess the necessary resources. We also control for a state's trade exports as a proportion of GDP to measure its openness to the global economy. States more integrated into the global economy are more susceptible to its transnational risks and rewards, including the diffusion of terrorism.

Sixth, we include a measure of ethnic fractionalization. Ethnic fractionalization is associated with the quality of domestic institutions and economic growth, both of which affect a state's capacity to prevent the spread of terrorist groups (Alesina et al. 2003).

Finally, we control for the country's regime type. To this end, we use the polyarchy index from the Varieties of Democracy Project (V-Dem) (Coppedge et al. 2019). We chose this variable because it is a continuous measure that better accounts for variation within both democracies and autocracies and recent work shows that the V-Dem out-performs alternative indices, such as Freedom House and Polity, because it better captures the "multidimensional" nature of democracy (Lindberg et al. 2014, 159). Liberal democracies are less likely to enact restrictive immigration policies (Hollifield 2004), and more autocratic states are less likely to experience terrorist diffusion because they possess greater coercive capabilities.

Pooled Results

To begin, we pool data from all of the groups together and estimate multilevel logistic regressions. The resulting pooled data set contains the diffusion network for all 63 terrorist groups. Observations are nested in countries, years, *and* groups. The goal of this analysis is to use the variance between terrorist groups to more precisely estimate the overall effect of border walls, as well as the individual

	Model 1	Model 2	Model 3	Model 4
Border Fence	-0.33** (0.14)	-0.56*** (0.14)	-0.35*** (0.09)	-0.39** (0.14)
Exposure	2.23*** (0.07)	2.21*** (0.07)	2.03*** (0.06)	2.15*** (0.07)
Log GDPc	1.46*** (0.29)	0.36 (0.30)	1.27*** (0.11)	0.69** (0.30)
CINC Score	-0.30 (0.41)	-0.54 (0.43)	0.00 (0.08)	-0.83* (0.44)
Polyarchy (V-Dem)	0.34** (0.16)	0.25 (0.16)	0.53*** (0.09)	0.09 (0.16)
Trade Openness	0.97** (0.41)	0.07 (0.42)	-0.42 (0.29)	0.28 (0.42)
Ethnic Fractionalization	0.54* (0.33)	0.11 (0.34)	0.12* (0.07)	0.06 (0.34)
Peace Years	-0.05 (0.12)	-0.07 (0.12)	-0.62*** (0.09)	-0.07 (0.12)
Ongoing MID	0.08 (0.07)	0.13* (0.07)	0.21*** (0.06)	0.04 (0.07)
Group Allies	1.44*** (0.08)	1.41*** (0.08)	1.38*** (0.07)	1.40*** (0.08)
Log Refugees	0.43*** (0.11)	0.15 (0.11)	0.45*** (0.07)	0.13 (0.11)
Year		0.05*** (0.01)	0.03*** (0.00)	0.23*** (0.02)
Year ²				-0.01*** (0.00)
Year ³				0.00*** (0.00)
Intercept	-3.22*** (0.28)	-4.78*** (0.36)	-2.77*** (0.17)	-5.59*** (0.36)
AIC	8799.91	8738.61	10428.79	8687.68
BIC	8914.95	8853.64	10543.82	8818.05
Log Likelihood	-4384.96	-4354.30	-5199.39	-4326.84
Num. obs.	15818	15818	15818	15818
Var: Group (Intercept)	0.60	0.81	0.60	0.84
Var: Country (Intercept)	5.61	6.52		6.47
Var: Year (Intercept)	0.12			
Var: Region (Intercept)			0.03	

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$

Table 2: Border fences and terrorist group diffusion; pooled multi-level logit results

effects for each group.

In these models, we use various combinations of random effects. We acknowledge that data requirements pose an important trade-off for the rich structure of these models. As a result, we cannot both estimate all of these random effects structures in the same model and estimate all of the main coefficients. To ameliorate this issue, we estimate several models with different combinations of random effects. First, we include random intercepts for terrorist groups which assume that the coefficients for each terrorist group are modeled by a group-level distribution. Second, in models 1, 2, and 4, we include destination country random intercepts. These random effects account for the data's country-level structure. Third, in model 1, we include year random effects to account for temporal dependence in the data. To further account for temporal dependence, we include a linear time trend (models 2 and 3) and a cubic polynomial time trend (model 4) (Carter and Signorino 2010). Finally, we estimate region random effects in model 3 to account for broader geographic diversity in border fence construction and the diffusion of terrorist groups.

The results are found in Table 2. In all four models, we estimate a negative effect of border barriers,¹⁰ That is, we infer that, on average, border walls inhibit the diffusion of terrorist groups. Figure 2 presents the average marginal effects for each model. The effects support H_1 and suggest that the presence of a border fence decreases the probability that a terrorist group diffuses by 0.02 to 0.04 ($p < 0.05$). This reduction is substantively significant as the modal number of groups that diffuse to a country in a given year is 0. This result shows that border fences impede terrorist group diffusion, *on average*. The notion that border fences inhibit the spread of terrorist groups is consistent with both the academic literature and the conventional wisdom among policy-makers. We also find associations for each of the control variables that are consistent across specifications and are in line with theoretical expectations.

Be that as it may, the variance in the random effects is large (e.g., for model 2, $\sigma_{\text{Group}}^2 = 0.81$, $\sigma_{\text{Country}}^2 = 6.52$), which implies that the models estimate significant heterogeneity in the effects. Predicted probability plots bear out this heterogeneity. In figure 3, we compare the predicted probability

10. We replicate these models with the proportion of border fenced and find consistent results. See Appendix table A3.

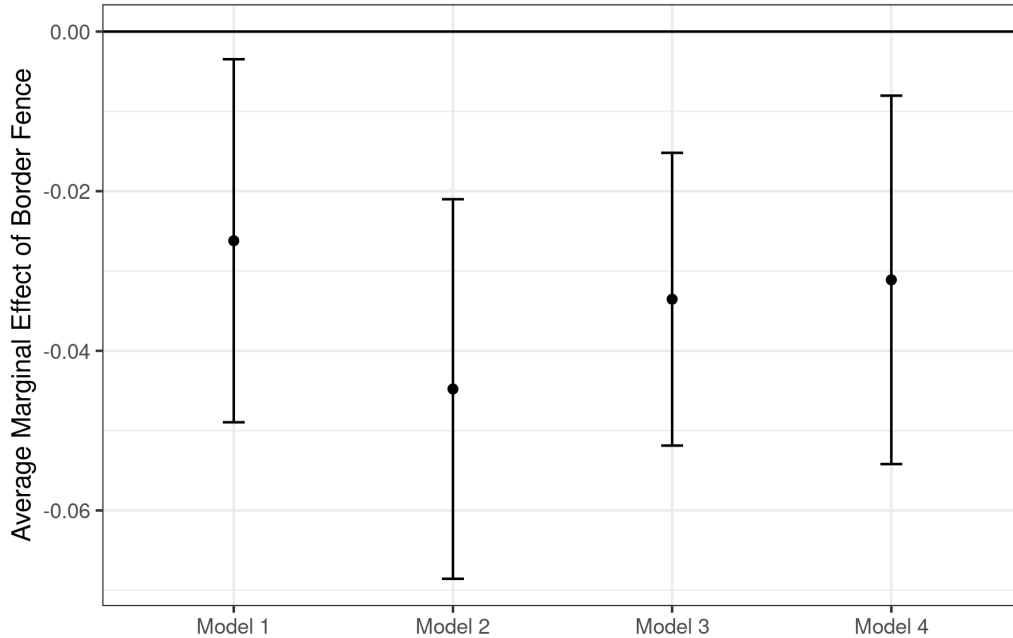


Figure 2: The average marginal effect of a border fence on the diffusion of terrorist groups. Point estimates are average marginal effects from the models in table 2 averaged over the sample.

of terrorist group diffusion over time between states with and without border fences. While the negative and significant effects in each model in table 2 suggest that walls prevent the diffusion of groups, inferences from the predicted probabilities are not so clear. Indeed, figure 3 shows that the probability of diffusion increases from 1968 to 2013; however, there is no significant predictive difference in the effect of fences. This finding reflects the underlying variance among terrorist groups and destination countries. This variance makes it difficult to estimate an over-arching effect of border fences. In the next section, we explicitly estimate heterogeneous effects across groups, testing H_2 and H_3 .

Group-Specific Results

Given the variance we observe in the previous section, we analyze the effect of border fences for each terrorist group. To do so, we extend Model 2 in table 2 by using random slopes to allow the estimated association between border fences and diffusion to vary across groups. The full model is,

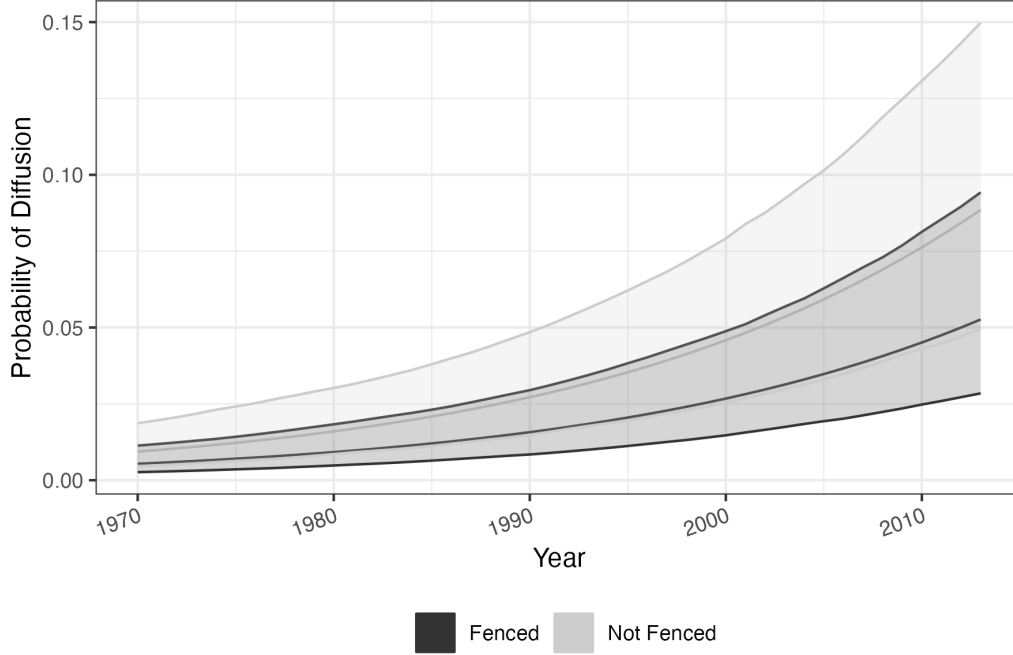


Figure 3: Predicted probabilities of diffusion for fenced and unfenced states from 1968 to 2013. Results are from model 2 in table 2 and all other variables are held at their means.

$$Y_{\text{Diffusion}} \sim \text{Bernoulli}(p_i)$$

$$p_i = \text{Logit}^{-1}(\alpha_{\text{State}[i]} + \beta_{\text{Group}[j]}x_i + \gamma z_i)$$

$$\begin{bmatrix} \alpha_{\text{State}} \\ \beta_{\text{Group}} \end{bmatrix} \sim \text{MVNormal} \left(\begin{bmatrix} \alpha_{\text{State}} \\ \beta_{\text{Group}} \end{bmatrix}, \begin{pmatrix} \sigma_{\alpha}^2 & \rho\sigma_{\alpha}\sigma_{\beta} \\ \rho\sigma_{\alpha}\sigma_{\beta} & \sigma_{\beta}^2 \end{pmatrix} \right),$$

in which we estimate individual state intercepts ($\alpha_{\text{State}[i]}$) and group-specific effects of border fences ($\beta_{\text{Group}[j]}$). In addition, z_i represents a matrix of other covariates and γ represents a vector of coefficients that include a linear time trend. This model is more sophisticated than simply interacting the border fence variable with group dummy variables, the use of which assumes that the model cannot use information from the effect of border fences on PKK to learn about the effect of border fences on Boko Haram.

In table 3, we report the parameter estimates from this model. The results are similar to model 2

	Model 1
Border Fence	-1.31** (0.48)
Exposure	2.29*** (0.07)
Log GDPc	0.31 (0.30)
CINC Score	-0.25 (0.42)
Polyarchy (V-Dem)	0.28* (0.16)
Trade Openness	0.28 (0.43)
Ethnic Fractionalization	0.24 (0.35)
Peace Years	-0.08 (0.12)
Ongoing MID	0.14* (0.07)
Group Allies	1.44*** (0.08)
Log Refugees	0.16 (0.11)
Year	0.06*** (0.01)
Intercept	-4.79*** (0.36)
Group RE	Yes
Country RE	Yes
AIC	8476.28
BIC	8606.65
Log Likelihood	-4221.14
Num. obs.	15818
Var: Country (Intercept)	6.49
Var: Group (Intercept)	1.08
Var: Group Border Fence	7.05
Cov: Group (Intercept) Border Fence	-1.34

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$

Table 3: Border fences and terrorist group diffusion, group-level random slopes. These models estimate the average effect of border fences and individual effects for each group.

in table 2. Nearby exposure to a group is strongly associated with the diffusion of that group to a given country. In addition, states engaged in an ongoing military industrialized dispute are more likely to experience the diffusion of terrorist groups, as are those that contain a group's allies. Conversely, states that have been at peace longer are less likely to experience diffusion. We also observe that the probability of group diffusion has increased over time, a finding that is consistent with figure 3. Most importantly, this model estimates a strong negative association between border fences and terrorist group diffusion. This estimate is stronger than the corresponding parameter in table 2, and it provides our mean effect estimate.

However, as expected, we report significant variation in the effect of border fences across groups ($\sigma_{\text{Group}}^2 = 7.05$), which validates our exploration of these group-level effects. To do so, we simulate 5,000 times from the coefficient distribution to produce 5,000 estimated effects for each group. We use the median as the point estimate and the 0.025th and 0.975th quantiles as the 95% confidence interval. Figure 4 presents the results for each group. The model estimates that border fences are negatively associated with the probability of diffusion for 15 groups, positively associated for 13 groups, and insignificantly associated for the remaining 35 groups. So, while border fences are negatively associated with diffusion, on average, they either do not affect, or provoke a backlash from, the majority of groups. In table 4, we list each group based on its estimated effect.

The geographic distribution of these effects is noteworthy. In figure 5, we take the groups in each of the categories in table 4 and note their main base of operations. Doing so demonstrates whether groups for which fences prevent their diffusion, for example, are clustered in particular geographic areas. Such clustering would reveal whether certain effects are localized to specific regions, rather than are general.

On the one hand, we observe geographic clustering in groups for which border fences prevent their diffusion. Most of these groups are based in the Middle East and North Africa, such as the PKK, but we see a presence in South Asia, South America, and Europe. On the other hand, we do not observe similar geographic clustering in groups for which fences provoke a backlash or are unassociated with their spread. This weak evidence for clustering in one of the three categories suggests that our results

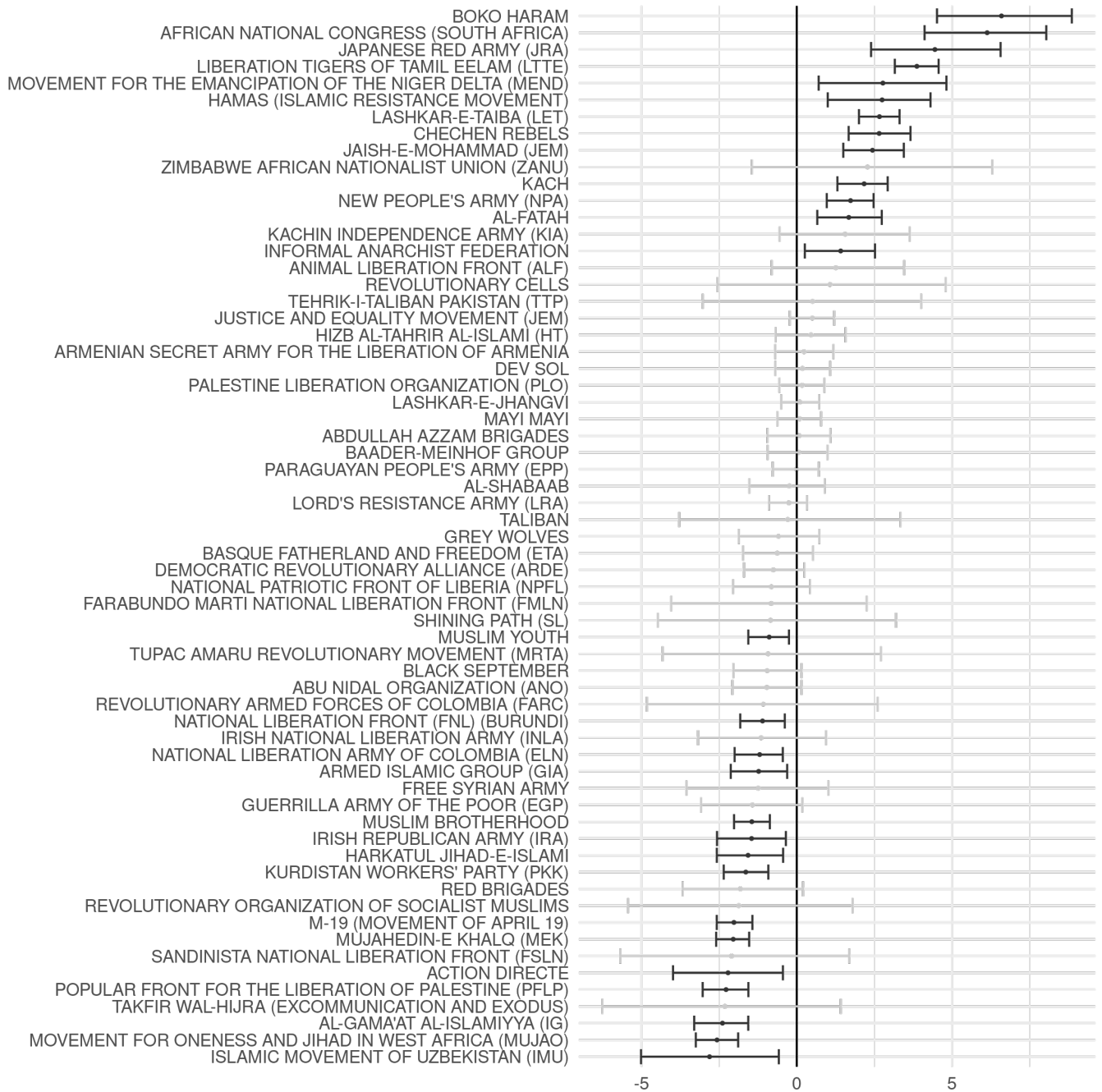


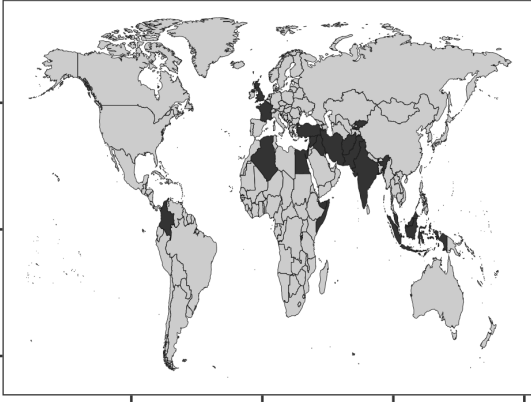
Figure 4: The effect of border fences on group diffusion. Note: all models include the following control variables: exposure, refugees (log), GDPc (log), liberal democracy, ongoing MID (COW), group ally in a given state, peace years, trade openness, ethnic fractionalization, CINC score, a linear time trend, and group and country random effects.

	Group
Prevent	Action Directe, Al-Gama'at Al-Islamiyya (IG), Armed Islamic Group (GIA), Harkatul Jihad-e-Islami, Irish Republican Army (IRA), Islamic Movement of Uzbekistan (IMU), Kurdistan Workers' Party (PKK), M-19 (Movement of April 19), Movement for Oneness and Jihad in West Africa (MUJAO), Mujahedin-e Khalq (MEK), Muslim Brotherhood, Muslim Youth, National Liberation Army of Colombia (ELN), National Liberation Front (FNL) (Burundi), Popular Front for the Liberation of Palestine (PFLP)
Backlash	African National Congress (South Africa), Al-Fatah, Boko Haram, Chechen Rebels, Hamas (Islamic Resistance Movement), Informal Anarchist Federation, Jaish-e-Mohammad (JeM), Japanese Red Army (JRA), Kach, Lashkar-e-Taiba (LeT), Liberation Tigers of Tamil Eelam (LTTE), Movement for the Emancipation of the Niger Delta (MEND), New People's Army (NPA)
Insignificant	Abdullah Azzam Brigades, Abu Nidal Organization (ANO), Al-Shabaab, Animal Liberation Front (ALF), Armenian Secret Army for the Liberation of Armenia, Baader-Meinhof Group, Basque Fatherland and Freedom (ETA), Black September, Democratic Revolutionary Alliance (ARDE), Dev Sol, Farabundo Marti National Liberation Front (FMLN), Free Syrian Army, Grey Wolves, Guerrilla Army of the Poor (EGP), Hizb al-Tahrir al-Islami (HT), Irish National Liberation Army (INLA), Justice and Equality Movement (JEM), Kachin Independence Army (KIA), Lashkar-e-Jhangvi, Lord's Resistance Army (LRA), Mayi Mayi, National Patriotic Front of Liberia (NPFL), Palestine Liberation Organization (PLO), Paraguayan People's Army (EPP), Red Brigades, Revolutionary Armed Forces of Colombia (FARC), Revolutionary Cells, Revolutionary Organization of Socialist Muslims, Sandinista National Liberation Front (FSLN), Shining Path (SL), Takfir wal-Hijra (Excommunication and Exodus), Taliban, Tehrik-i-Taliban Pakistan (TTP), Tupac Amaru Revolutionary Movement (MRTA), Zimbabwe African Nationalist Union (ZANU)

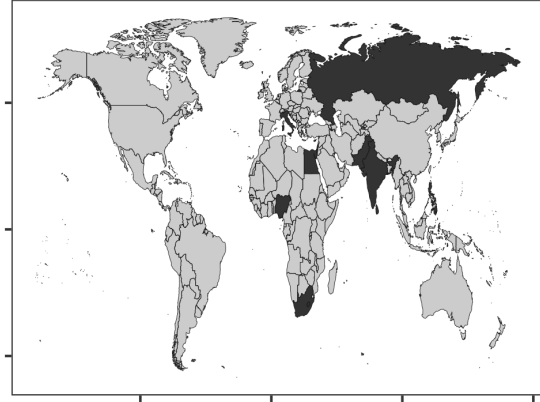
Table 4: Terrorist groups separated into those for which border fences are positively, negatively, and insignificantly associated with diffusion

are not driven solely by unobserved regional confounders. Rather, estimated differences in the effect of border fences on diffusion are likely driven by group-level heterogeneity.

Prevent, $\beta < 0$



Backlash, $\beta > 0$



Insignificant Effect, $\beta = 0$

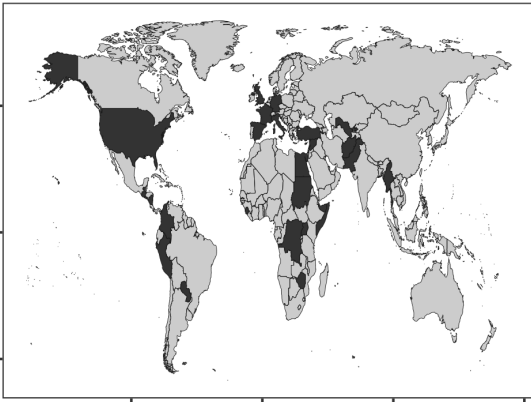


Figure 5: The geographic distribution of the effect of border fences. Highlighted countries contain the base of a group for which border fences are positively, negatively, or insignificantly associated with its diffusion.

However, country-level economic factors may also play a role in this variation in clustering. Figure 5 reveals that border walls impede diffusion in the Middle East and North Africa and are insignificantly associated with diffusion in more developed states. It could be the case that walls “work” in the former cases because these regions are less developed and militant groups, rely more on foot traffic.¹¹ Accordingly, in figure 6, we use Hainmueller, Mummolo, and Xu (2019)’s binning estimator

11. We thank an anonymous reviewer for raising this point.

to test whether economic development moderates the walls' effects. The results suggest that walls impede diffusion in low and high-income states; militants likely use more foot traffic in low-income states, which walls are more adept at stopping, and high-income states build more expensive and more effective barriers.

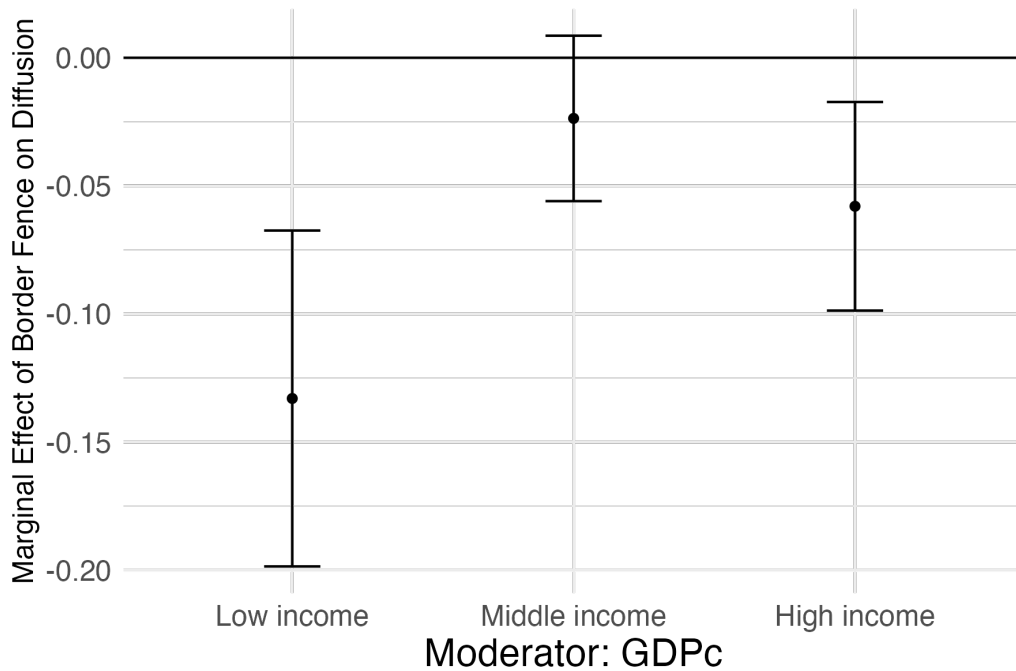


Figure 6: How economic development moderates the association between border fences and the diffusion of terrorism

Furthermore, this discussion raises potential endogeneity concerns in this analysis. It could be the case that the construction of border walls aggrieves local populations and produces violence, especially in cases in which communities rely on border crossing for economic well-being. Attacks by other groups could also prompt the construction of a fence, which would produce a type of reverse causality. These issues are inherent to this analysis, where states do not randomly construct border walls and multiple groups are often active in the same state. While controlling for potential confounders addresses some endogeneity concerns, this pooled time-series cross-sectional analysis cannot entirely mitigate all of them. Below, we analyze specific groups in individual country contexts. Such case studies are necessary to process trace the effect of treatments, like border fences, which present so many endogeneity problems.

Robustness Checks

Several robustness checks provide further confidence in the statistical findings. First, we replicate these results with a different measure of border fencing. An indicator of whether a state builds a wall on any of its borders is a coarse measure. As a remedy, we use the proportion of a state's borders that are fenced to provide a more nuanced measure. The results are in Appendix table A3 and are largely consistent with those above. While we estimate a negative and significant association between the proportion of border fenced and diffusion in Models 2 and 3, we observe an insignificant negative relationship in Models 1 and 4. We also use a linear probability model to replicate our analysis. In appendix table A5, we present the pooled linear probability model results that are analogous to those in table 2. These models estimate a negative and significant association between border fences and the probability that a terrorist group diffuses to a given state.

In both sets of models, the precision of our estimates and the variance in the group random intercepts further corroborate the use of a random slopes model, which we present in appendix table A4 and A6. In the former, we report a negative and significant association between the proportion of border fenced and diffusion, while in the second we estimate a negative, but insignificant, association. Importantly, there is significant convergence in the group-level results. The estimated effect of border fences on diffusion is consistent across the two models for 44 out of our 63 groups ($\sim 70\%$).

Given the coarseness of both the binary border fence and the proportion of border-fenced variables, we also use Kenwick, Simmons, and McAlexander (2023)'s Border Crossings of the World data set to corroborate our results. Kenwick, Simmons, and McAlexander (2023) collect data on the authority and infrastructure at a country's border, including split-lane inspection facilities, official buildings, and gates. As such, this data set provides the most comprehensive and detailed information on border crossings in the world. The limitation of this data set is that it only is available from the early 1990s. Due to this limitation, we include it as a robustness check of our main results. We use their aggregate structures index which is an additive index of the lower-level variables (gates, split lanes, and official buildings). The results are in appendix table A7 and they report a negative and significant association between fortified border structures and the probability of group diffusion.

Heterogeneity and Possible Mechanisms

While these robustness checks provide confidence in our results, we must highlight an important limitation that we cannot resolve with such tests. While we observe significant variation in the effect of border fences on the diffusion of terrorist groups, we do not know what drives this variation. Ideally, we would use a data set like the Extended Data on Terrorist Groups (EDTG) to estimate the correlates of a backlash effect, for example. However, the EDTG does not have sufficient coverage of our sample, and many of the variables are time-varying. We lack the data to estimate group-year effects, which precludes us from taking advantage of this data set.

But understanding this heterogeneity is crucial. Not only does it emphasize the varied nature of militant organizations, but it also underscores why we expect border walls to have differential impacts. Given the data limitations, we examine eight militant organizations from Egypt and Pakistan to explore how specific group characteristics influence the effectiveness of border fences in preventing or exacerbating the spread of terrorism. Both Egypt and Pakistan provide optimal settings for this analysis, as each country hosts groups for which border fences have varying impacts—be it positive, negative, or negligible—on the diffusion of terrorism. We can therefore hold the country context constant and examine between-group heterogeneity. The groups are in table 5 and a summary of our analysis is in appendix table A8.

Country	Group	Effect
EGY	ABDULLAH AZZAM BRIGADES	$\beta = 0$
EGY	AL-GAMA'AT AL-ISLAMIYYA (IG)	$\beta < 0$
EGY	MUSLIM BROTHERHOOD	$\beta < 0$
EGY	JAPANESE RED ARMY (JRA)	$\beta > 0$
PAK	LASHKAR-E-JHANGVI	$\beta = 0$
PAK	TEHRIK-I-TALIBAN PAKISTAN (TTP)	$\beta = 0$
PAK	ISLAMIC MOVEMENT OF UZBEKISTAN (IMU)	$\beta < 0$
PAK	LASHKAR-E-TAIBA (LET)	$\beta > 0$

Table 5: Egypt and Pakistan contain groups for which walls have all three effects: insignificant, backlash, and prevention. Group-level heterogeneity likely explains these divergent findings within the same country context.

To interrogate how group characteristics shape the heterogeneity of effects, we examine several

traits that fit under broader umbrellas of transnational spread, capabilities, total activity, as well as ideology, and group goals. Piazza (2009) notes that even within Islamist groups, those that draw on universalist ideologies enjoy broader support compared to ones that operate locally. Others have suggested that having multiple bases grants groups options, either in terms of relocating to countries with weaker regimes or in terms of convenience, by providing plentiful nearby targets abroad (Gaibullov and Sandler 2021). Drawing on these insights, we conjecture that older groups that draw sustenance from a wider, transnational community and that operate across multiple bases may more easily circumvent the logistical handicaps imposed by fences.

We consider eight specific militant organizations, particularly focusing on their operational bases and the proportion of their transnational attacks, as captured by the EDTG's share of transnational terrorism. In general, we reason that more capable groups should be better equipped to withstand any damaging effects of border barriers. Groups that control territory also enjoy command over illicit routes, which facilitates clandestine movement across borders (Asal, Rethemeyer, and Schoon 2019; Avdan and Omelicheva 2021). Access to funding, such as through the financial backing of a state sponsor, or participation in illicit trades, such as the drug trade, are other factors that boost the group's material capabilities. Participation in the drug trade may also lend militants intimate knowledge of clandestine routes across porous stretches of the border (Asal, Rethemeyer, and Schoon 2019).

Overall activity, especially lethality, and sophisticated attack tactics may render groups more resilient in the face of logistical barriers. Thus, we examined these eight groups' total number of attacks and fatalities across their lifespans and their average fatality rates per year. We also looked at the diversity of attacks, an indicator in EDTG that varies from 0 to 1. Fences may not dent the overall volume of terrorism but instead compel groups to innovate and substitute alternative attack modes (Avdan and Gelpi 2017; Blair 2023). We surmise that any of these factors, independently, or in combination, may explain why we observe differentiated effects of fences.

Finally, the age of a terrorist group relative to the construction of a fence presents an additional factor. Existing walls may more effectively restrict the expansion of nascent groups compared to older ones, which might have developed strategies to bypass counterterrorism measures. Our analysis,

while not pinpointing the specific effects of individual fences on particular groups, considers the founding year of each group against the backdrop of fences erected by states within the potential geographic expanse for diffusion.

Egypt

We turn first to the Egyptian case. We begin with the Abdullah Azim Brigades, where border walls appear to have no discernible impact on their diffusion. This observation prompts us to consider various elements that might contribute to this result. The group maintains six bases and exhibits moderate activity outside its primary region, with about 10% of its attacks being conducted abroad annually. It also ranks towards the larger end of the size spectrum. The group expanded its operations to Israel in 2013, nine years after its formation. Yet, Israel is fortified by fences along its borders with Egypt (constructed in 1968) and Lebanon (erected in 2000). These walls could potentially neutralize the group's strengths, explaining the null finding.

Fences inhibit the spread of the next two groups, Al-Gama'at Al-Islamiyya (IG) and the Muslim Brotherhood. At first glance, both groups initially seem to possess advantages that could overcome the effect of walls, such as state sponsorship and territorial control. IG uses a diverse array of tactics, with an average diversity score of 0.42 and it is both lethal and active, responsible for an average of 79.5 fatalities annually. Despite these strengths, both organizations exhibit limited transnational operations, as reflected by a low ratio of transnational to total attacks.

The Muslim Brotherhood's activities are largely confined within Egypt, further restricting its transnational reach. This limited geographic scope likely overwhelms the effect of age in our model. It was founded in 1970 and diffused to India in 1986 at 16 years of age, but the model estimates that fences have a reductive impact.

Additionally, IG is experiencing a decline in its capabilities, a consequence of diminished support from Libya and Sudan in the aftermath of the Cold War. The group also faces internal challenges, including factional disputes, especially notable following its ceasefire agreement with the Egyptian government in 1997. These factors highlight the complex factors at play, including geopolitical dy-

namics and organizational structures, that influence the effectiveness of physical barriers like fences in impeding the spread and operations of militant groups.

The case of the Japanese Red Army (JRA) exemplifies a backlash effect against the intended purposes of border walls. Notably, the JRA established a base in Lebanon, which, in line with the concept of having convenient access to foreign targets (Gaibulloev and Sandler 2021), likely aided its diffusion into Egypt, even in the face of border fortifications. This strategic positioning, combined with the group's already significant propensity for transnational attacks, contributes to the positive coefficient observed in our analysis. The existence of such a base underscores how geographical and strategic factors can circumvent the physical barriers intended to thwart terrorist movements, suggesting that the mere presence of border walls may not be sufficient to prevent the spread of determined and resourceful militant groups.

Pakistan

In Pakistan, we analyze four groups, each with a distinct response to border barriers. The first two, Lashkar-e-Jengvi (LeJ) and Tehrik-i-Taliban (TTP), although diverse in their attack tactics, have not executed a significant number of attacks outside their base country. TTP operates strictly within Pakistan. Yet, both groups exhibit characteristics that might neutralize or circumvent the intended effects of physical barriers. LeJ, active in both Pakistan and India, is known for its moderate activity level and lethality. TTP stands out for its lethality, size, and the advantages of state sponsorship and territorial control. While it remains speculative to identify specific attributes that directly mitigate the impact of fences, the underlying pattern suggests that certain inherent features of these groups might enable them to navigate around the restrictions imposed by walls.

Nevertheless, India's fence with Pakistan, erected in 1989 did not prevent LeJ's diffusion, despite the group's relative infancy. However, we emphasize that the average effect of fences on LeJ is null. This example complicates the picture of how the age of groups relates to their ability to diffuse in the network. Of course, given the proliferation of border walls over time, newer groups encounter more barriers to movement, suggesting that the cumulative lock-in effect for newer groups may be

stronger.

In contrast, the Islamic Movement of Uzbekistan (IMU) serves as a clear example of how fences can thwart the transnational diffusion of militant groups. Initially, the IMU's activities were limited, characterized by a lack of diverse tactics and an absence of transnational attacks. This is supported by detailed case histories from START's Big, Allied and Dangerous (BAAD) online platform and Stanford's Mapping Militant Organizations (MMO), which confirm the group's restricted operational scope.¹² Despite establishing bases in multiple locations, the IMU failed to achieve its primary objective of overthrowing the Uzbek government. Following its establishment, the group's militants were expelled from Uzbekistan, spreading across seven countries, beginning with Tajikistan and moving into other Central Asian states. The group's campaign against the Uzbek regime ceased in 2001 following the US invasion of Afghanistan, leading to a significant decline in its operational momentum, characterized by reduced attacks, casualties, and a loss of members. Consequently, Pakistan's fencing has played a pivotal role in hindering the IMU's ability to spread into the country, exemplifying a case where barriers have effectively curtailed the capabilities of a militant group.

Finally, for Lashkar-e-Taiba (LeT), the backlash effect we see may be credited to the group's capabilities. It is relatively large and lethal, netting a total of 793 fatalities over its lifespan. Importantly, it is also fairly active abroad and operates in Pakistan and India.¹³

Summary

These dynamics underscore the multifaceted impact of barriers on militant activities. As we reflect on our analysis, a few overarching themes emerge. First, factors that typically enhance a group's operational strength can sometimes counteract the intended effects of walls. In cases where groups

12. See <https://www.start.umd.edu/baad/database/islamic-movement-uzbekistan-imu-2012.html> START's BAAD Database; https://cisac.fsi.stanford.edu/mappingmilitants/profiles/islamic-movement-uzbekistan#highlight_text_10187 Stanford's Mapping Militant Organizations

13. We should reiterate that our model does not parse attacks by origin country. As such, for this case, we would be measuring whether fences impact the ability of LeT to conduct attacks in one of its bases of operation, Pakistan, regardless of whether attacks are conducted by militants already in Pakistan or flow from India. Taking a cue from Blair (2023) we posit that fences not only impede the movement of militants across borders, but also derail the movement of materiel, funding, and arms. Consequently, by encircling groups, fences geographically delimit their operations. By inhibiting mobility overall, fences could in principle lower the probability that a militant group conducts attacks in its base country of operation.

Predicted Effect	Factors
Reduction	Smaller Groups Low Diversity of Attacks Lack of Bases
Backlash	Multiple Outside Patrons Multiple Bases Older Groups

Table 6: Summary of Heterogeneous Effects: Factors Predicting Backlash and Prevention

are losing influence or have minimal international presence, barriers tend to be more effective at curtailing terrorism’s spread. Interestingly, attributes like group size and territorial control do not consistently correlate with the effectiveness of barriers, and predicting the insignificance (i.e., $\beta = 0$) of these factors remains challenging. Table 6 summarizes these heterogeneous effects.

This lesson is an important takeaway from this analysis because it shows that leaders must refrain from presuming that policy interventions provide universal solutions and instead consider how specific means might satisfy different ends. In contemplating the construction of border walls, policymakers face the delicate task of balancing the implementation of a costly and potentially divisive strategy, which may achieve desired outcomes on average but could also lead to unintended consequences that undermine their objectives. Applying this network approach to the study of terrorist group diffusion provides specific empirical evidence for this important lesson.

Conclusion

Our study contributes to understanding the effect of border walls on the diffusion of terrorist groups. Our findings reveal that while border fences can reduce the spread of transnational terrorism, their effectiveness is highly variable and contingent upon specific group characteristics.

We find that the impact of border barriers varies significantly across different terrorist groups. Groups with a history of regional violence, established alliances, or significant operational capabilities are less deterred by border fences. Conversely, walls are more likely to constrain newer and smaller groups with fewer resources. This heterogeneity highlights the difficulty of using physical barriers as

a counterterrorism measure and suggests that a one-size-fits-all approach is insufficient.

These findings suggest significant policy implications. Border walls entail considerable monetary and political costs, and our results suggest they are not a panacea for preventing the spread of terrorism. As such, policymakers should carefully evaluate the justification for constructing border walls.

Future research should continue to explore the heterogeneous effects of walls, particularly by examining how groups' tactics and strategies evolve in response to these physical constraints. Additionally, expanding the analysis to include a wider range of groups and regions will provide a more comprehensive understanding of how border walls affect the transnational diffusion of terrorism.

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Appendix

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A Summary of Data

Variable	n	mean	sd	max	min
Group Diffused	18848	0.18	0.39	1.00	0.00
Border Fence	18848	0.12	0.32	1.00	0.00
Prop. Fenced Border	18544	0.04	0.11	0.86	0.00
Exposure	18848	0.07	0.19	1.00	0.00
MID Ongoing	18848	0.39	0.49	1.00	0.00
Peace Years	18848	4.27	6.68	46.00	0.00
Group Allies	18848	0.11	0.55	9.00	0.00
Economic Openness	17509	0.01	0.02	0.35	0.00
Log Refugees	18848	4.18	5.15	15.99	0.00
Polyarchy (V-Dem)	18556	0.47	0.31	0.92	0.01
Log GDPc	18319	9.06	1.13	12.03	5.82
CINC Score	18707	0.01	0.03	0.23	0.00
Ethnic Fractionalization	16286	0.39	0.26	0.89	0.00

Table A1: Summary statistics of regression variables. Logarithmic transformations are included. Values are rounded to the nearest hundredth.

B Universe of Terrorist Groups

Abdullah Azzam Brigades	Jaish-e-Mohammad (JEM)
Abu Nidal Organization (ANO)	Japanese Red Army (JRA)
Action Directe	Justice and Equality Movement (JEM)
African National Congress (South Africa)	Kach
Al-Fatah	Kachin Independence Army (KIA)
Al-Gama'at Al-Islamiyya (IG)	Kurdistan Workers' Party (PKK)
Al-Qaida	Lashkar-e-Jhangvi
Al-Shabaab	Lashkar-e-Taiba (LET)
Animal Liberation Front (ALF)	Liberation Tigers of Tamil Eelam (LTTE)
Armed Islamic Group (GIA)	Libyan
Armed People	Lord's Resistance Army (LRA)
Armenian Secret Army for the Liberation of Armenia	M-19 (Movement of April 19)
Baader-Meinhof Group	Mayi Mayi
Basque Fatherland and Freedom (ETA)	Movement for Oneness and Jihad in West Africa (MUJAO)
Black September	Movement for the Emancipation of the Niger Delta (MEND)
Boko Haram	Mujahedin-e Khalq (MEK)
Chechen Rebels	Muslim Brotherhood
Commandos	Muslim Youth
Democratic Revolutionary Alliance (ARDE)	National Liberation Army of Colombia (ELN)
Dev Sol	National Liberation Front (FNL) (Burundi)
Farabundo Marti National Liberation Front (FMLN)	National Patriotic Front of Liberia (NPFL)
Free Syrian Army	New People's Army (NPA)
Grey Wolves	Palestine Liberation Organization (PLO)
Guerrilla Army of the Poor (EGP)	Paraguayan People's Army (EPP)
Hamas (Islamic Resistance Movement)	Popular Front for the Liberation of Palestine (PFLP)
Harkatul Jihad-e-Islami	Red Brigades
Hezbollah	Revolutionary Armed Forces of Colombia (FARC)
Hizb al-Tahrir al-Islami (HT)	Revolutionary Cells
Informal Anarchist Federation	Revolutionary Organization of Socialist Muslims
Irish National Liberation Army (INLA)	Revolutionary Workers Party
Irish Republican Army (IRA)	Sandinista National Liberation Front (FSLN)
Islamic Movement of Uzbekistan (IMU)	Shining Path (SL)

Table A2: Universe of terrorist groups used in the analysis

C Robustness Check: Proportion of Borders Fenced

	Model 1	Model 2	Model 3	Model 4
Proportion Fenced	-0.08 (0.10)	-0.27** (0.10)	-0.21** (0.06)	-0.14 (0.10)
Exposure	2.22*** (0.07)	2.21*** (0.07)	2.02*** (0.06)	2.14*** (0.07)
Log GDPc	1.34*** (0.28)	0.18 (0.29)	1.25*** (0.11)	0.58* (0.30)
CINC Score	-0.24 (0.41)	-0.44 (0.43)	-0.02 (0.08)	-0.75* (0.43)
Polyarchy (V-Dem)	0.37** (0.16)	0.28* (0.16)	0.58*** (0.09)	0.11 (0.16)
Trade Openness	1.07** (0.41)	0.24 (0.42)	-0.37 (0.29)	0.40 (0.42)
Ethnic Fractionalization	0.51 (0.32)	0.11 (0.34)	0.09 (0.07)	0.05 (0.34)
Peace Years	-0.05 (0.12)	-0.07 (0.12)	-0.63*** (0.09)	-0.07 (0.12)
Ongoing MID	0.08 (0.07)	0.12* (0.07)	0.21*** (0.06)	0.03 (0.07)
Group Allies	1.44*** (0.08)	1.41*** (0.07)	1.38*** (0.07)	1.40*** (0.07)
Log Refugees	0.42*** (0.11)	0.15 (0.11)	0.42*** (0.07)	0.13 (0.11)
Year		0.05*** (0.01)	0.03*** (0.00)	0.24*** (0.02)
Year ²				-0.01*** (0.00)
Year ³				0.00*** (0.00)
Intercept	-3.18*** (0.28)	-4.74*** (0.36)	-2.78*** (0.17)	-5.57*** (0.36)
Group RE	Yes	Yes	Yes	Yes
Country RE	Yes	Yes	No	Yes
Year RE	Yes	No	No	No
Region RE	No	No	Yes	No
AIC	8785.42	8728.55	10358.01	8674.18
BIC	8900.22	8843.36	10472.81	8804.29
Log Likelihood	-4377.71	-4349.28	-5164.00	-4320.09
Num. obs.	15578	15578	15578	15578
Var: Group (Intercept)	0.62	0.82	0.63	0.85
Var: Country (Intercept)	5.33	6.24		6.14
Var: Year (Intercept)	0.12			
Var: Region (Intercept)			0.03	

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$

Table A3: Proportion of border fenced and terrorist group diffusion; pooled multi-level logit results

	Model 1
Proportion Fenced	-1.10** (0.49)
Exposure	2.32*** (0.07)
Log GDPc	0.05 (0.31)
CINC Score	-0.06 (0.45)
Polyarchy (V-Dem)	0.32** (0.16)
Trade Openness	0.53 (0.43)
Ethnic Fractionalization	0.32 (0.38)
Peace Years	-0.08 (0.13)
Ongoing MID	0.14* (0.07)
Group Allies	1.42*** (0.08)
Log Refugees	0.16 (0.12)
Year	0.05*** (0.01)
Intercept	-5.04*** (0.38)
Group RE	Yes
Country RE	Yes
AIC	8388.03
BIC	8518.14
Log Likelihood	-4177.02
Num. obs.	15578
Var: Country (Intercept)	6.19
Var: Group (Intercept)	0.92
Var: Group Prop Fenced	7.49
Cov: Group (Intercept) Prop. Fenced	-0.68

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$

Table A4: Proportion of border fenced and terrorist group diffusion, group-level random slopes.

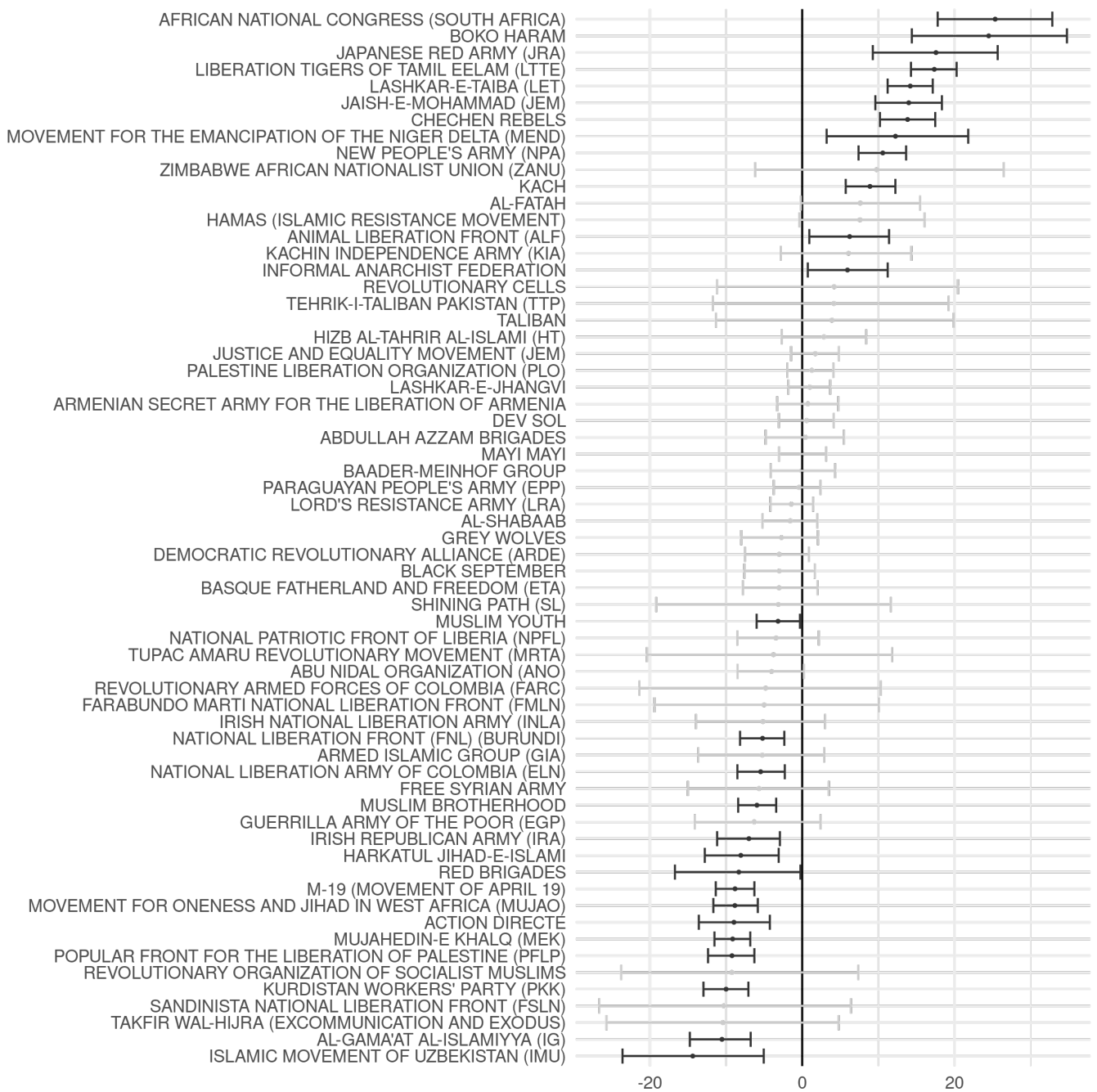


Figure A1: Group-specific effects of the proportion of a border fence on the probability of diffusion

D Robustness Check: Linear Probability Model

	Model 1	Model 2	Model 3	Model 4
Proportion Fence	-0.03** (0.01)	-0.05*** (0.01)	-0.02* (0.01)	-0.03** (0.01)
Exposure	0.32*** (0.01)	0.32*** (0.01)	0.32*** (0.01)	0.31*** (0.01)
Log GDPc	0.09*** (0.02)	0.02 (0.02)	0.11*** (0.01)	0.05** (0.02)
CINC Score	-0.02 (0.03)	-0.02 (0.03)	-0.00 (0.01)	-0.04 (0.03)
Polyarchy (V-Dem)	0.02 (0.01)	0.01 (0.01)	0.06*** (0.01)	-0.00 (0.01)
Trade Openness	0.11** (0.04)	0.04 (0.04)	-0.05* (0.03)	0.06 (0.04)
Ethnic Fractionalization	0.03 (0.02)	0.02 (0.03)	0.01** (0.01)	0.01 (0.03)
Peace Years	-0.01 (0.01)	-0.01 (0.01)	-0.04*** (0.01)	-0.01 (0.01)
Ongoing MID	0.01 (0.01)	0.01** (0.01)	0.03*** (0.01)	0.00 (0.01)
Group Allies	0.17*** (0.01)	0.16*** (0.01)	0.17*** (0.01)	0.17*** (0.01)
Log Refugees	0.03** (0.01)	0.01 (0.01)	0.03*** (0.01)	0.01 (0.01)
Year		0.00*** (0.00)	0.00*** (0.00)	0.02*** (0.00)
Year ²				-0.00*** (0.00)
Year ³				0.00** (0.00)
Intercept	0.17*** (0.02)	0.06** (0.02)	0.10*** (0.02)	-0.04 (0.03)
Group RE	Yes	Yes	Yes	Yes
Country RE	Yes	Yes	No	Yes
Year RE	Yes	No	No	No
Region RE	No	No	Yes	No
AIC	6568.66	6529.39	8626.26	6504.86
BIC	6691.37	6652.09	8748.96	6642.90
Log Likelihood	-3268.33	-3248.70	-4297.13	-3234.43
Num. obs.	15818	15818	15818	15818

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$

Table A5: Border fences and terrorist group diffusion; pooled multi-level linear probability model results

	Model 1
Border Fence	−0.04 (0.04)
Exposure	0.32*** (0.01)
Log GDPc	0.01 (0.02)
CINC Score	0.00 (0.03)
Polyarchy (V-Dem)	0.01 (0.01)
Trade Openness	0.05 (0.04)
Ethnic Fractionalization	0.02 (0.02)
Peace Years	−0.01 (0.01)
Ongoing MID	0.01** (0.01)
Group Allies	0.16*** (0.01)
Log Refugees	0.01 (0.01)
Year	0.00*** (0.00)
Intercept	0.06** (0.02)
Group RE	Yes
Country RE	Yes
AIC	6211.53
BIC	6349.57
Log Likelihood	−3087.77
Num. obs.	15818
Var: Country (Intercept)	0.03
Var: Group (Intercept)	0.01
Var: Group Fenced	0.05
Cov: Group (Intercept) Fenced	−0.01
Var: Residual	0.08

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$

Table A6: Border fences and terrorist group diffusion, group-level random slopes (linear probability model).

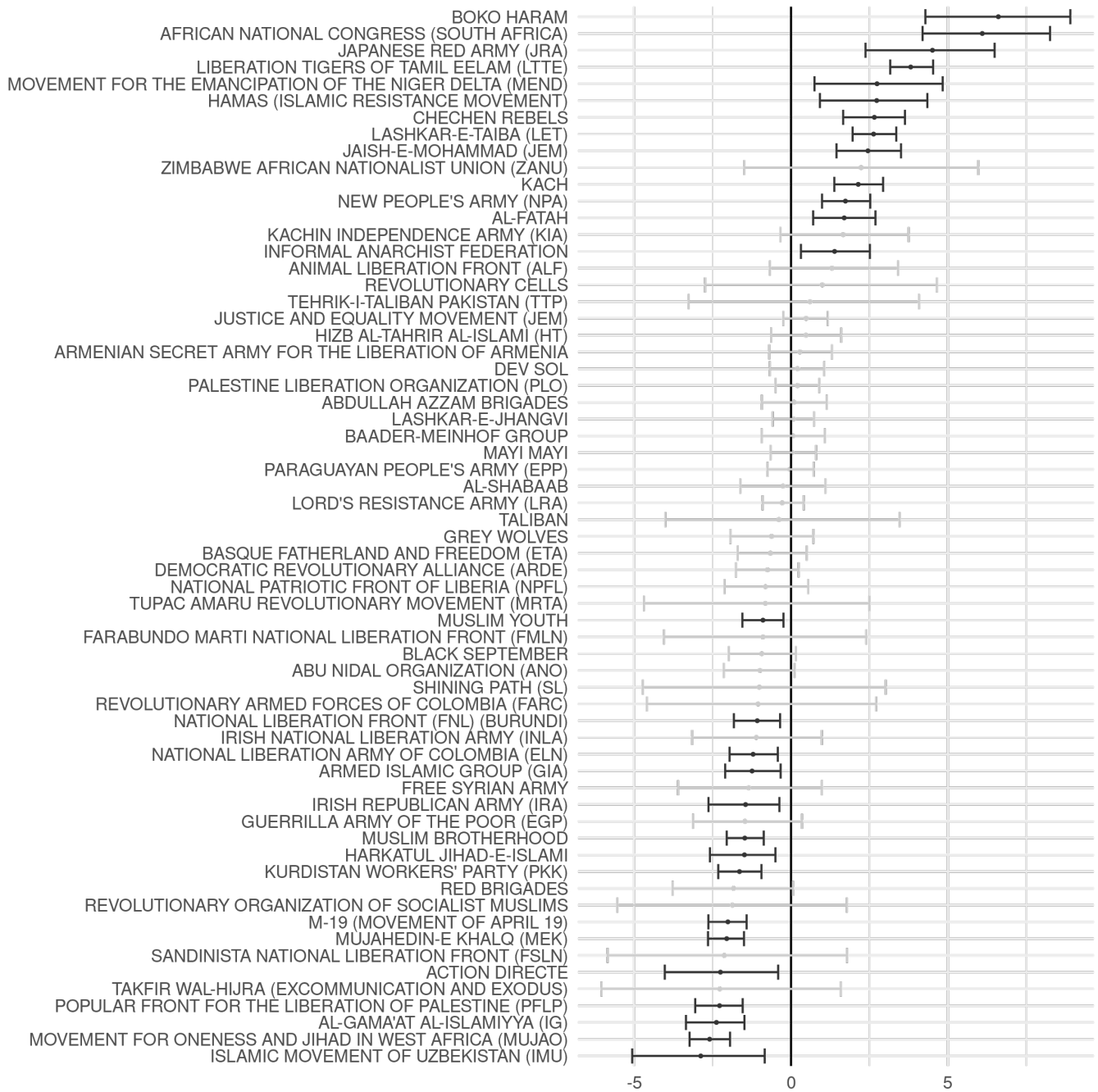


Figure A2: Group-specific effects of the proportion of a border fence on the probability of diffusion

E Robustness Check: Kenwick, Simmons, and McAlexander (2023) Data

	Model 1	Model 2	Model 3	Model 4
Border Structures	-1.40** (0.48)	-1.09** (0.47)	-1.00*** (0.12)	-1.24** (0.47)
Exposure	1.92*** (0.10)	1.87*** (0.10)	1.84*** (0.09)	1.85*** (0.10)
Log GDPc	1.19** (0.41)	0.93* (0.48)	1.80*** (0.19)	0.94** (0.47)
CINC Score	2.16*** (0.58)	1.80** (0.58)	0.53*** (0.14)	1.76** (0.57)
Polyarchy (V-Dem)	-0.25 (0.37)	-0.19 (0.37)	0.08 (0.15)	-0.22 (0.36)
Trade Openness	-0.26 (0.61)	-0.37 (0.62)	-0.59 (0.38)	-0.25 (0.62)
Ethnic Fractionalization	0.60 (0.45)	0.48 (0.46)	0.10 (0.10)	0.46 (0.45)
Peace Years	0.52** (0.19)	0.48** (0.19)	-0.41*** (0.11)	0.40** (0.19)
Ongoing MID	-0.10 (0.11)	-0.12 (0.11)	0.09 (0.09)	-0.01 (0.12)
Group Allies	1.52*** (0.10)	1.52*** (0.10)	1.53*** (0.10)	1.48*** (0.10)
Log Refugees	0.38* (0.20)	0.34* (0.20)	0.49*** (0.11)	0.34* (0.20)
Year		0.00 (0.01)	0.00 (0.01)	0.95 (0.85)
Year ²				-0.03 (0.03)
Year ³				0.00 (0.00)
Intercept	-3.30*** (0.31)	-3.26*** (0.48)	-2.35*** (0.34)	-12.50 (9.37)
Group RE	Yes	Yes	Yes	Yes
Country RE	Yes	Yes	No	Yes
Year RE	Yes	No	No	No
Region RE	No	No	Yes	No
AIC	4185.55	4186.87	4877.83	4186.60
BIC	4289.99	4291.30	4982.26	4304.96
Log Likelihood	-2077.78	-2078.43	-2423.91	-2076.30
Var: Country (Intercept)	4.57	4.40		4.20
Var: Group (Intercept)	0.49	0.49	0.41	0.50
Var: Year (Intercept)	0.00			
Var: Region (Intercept)			0.09	

*** $p < 0.001$; ** $p < 0.05$; * $p < 0.1$

Table A7: Replication of main models using the Kenwick, Simmons, and McAlexander (2023) border structures data

F Egypt and Pakistan Group Analysis (EDTG)

		Abdullah Azam Brigades	IG-Al-Gama'at	Muslim Brother- hood	Japanese Red Army (JRA)
EGYPT	Bases	EGY, IRQ, SYR, JOR, PSE, LBN	EGY, AFG	EGY	JPN LBN
	Share trans.	0.10/0.67	0.08/0.21	0.05/1	0.14/1
	Drug	no	no	no	no
	Sponsor	no	SDN, LBY	yes	no
	Terr. control	no	no	no	no
	Size	1000	500	-	10
	Attacks	17	255	94	8
	Fatalities	50	477	195	28
	Fatalities/yr	3.84	79.5	4.15	0.8
	Diversity	0.07/0.5	0.42/0.67	0.07/0.5	0.03/0.5
	Ideology	Rel	Rel	Rel	Left
	Goal	Ercsr	Ercsr	Ercsr	Ercsr
	Founded	2004	1993	1970	1970
Fence effect	NULL	NEGATIVE	NEGATIVE	POSITIVE	
PAKISTAN	Group	Lashkar-e-Jengvi	Tehrik-I Taliban	Islamic Move- ment of Uzbek- istan	Lashkar-e-Taiba
	Bases	IND, PAK	PAK	AFG, IRN, KAZ, TJK, KGZ, PAK, UZB	IND, PAK
	Share trans.	0.02/0.05	0.08/0.18	0	0.03/0.50
	Drug	no	no	yes	no
	Sponsor	no	2008-2010; AFG, IND	1998-2010; AFG	no
	Terr. control	no	yes	yes	no
	Size	10-100	20k-25k	100-1000	1000
	Attacks	108	636	2	120
	Fatalities	1028	3371	22	793
	Fatalities/yr	49	337	1.22	28
	Diversity	0.14/0.66	0.56/0.70	0	0.32/0.72
	Ideology	Rel	Nat	Rel	Rel
	Goal	Terr. Chg.	Status quo	Ercsr	Terr. Chg.
Founded	1996	2007	1998	1989	
Fence effect	NULL	NULL	NEGATIVE	POSITIVE	

Table A8: Analysis of the heterogeneous effect of border walls for terrorist groups from Egypt and Pakistan.