Barriers to Entry: Who Builds Fortified Boundaries and Why?\(^1\)

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Abstract

“Fortified boundaries” are asymmetrical, physical barriers for the purposes of border control. These boundaries are more formidable in structure than conventional boundary lines but less robust than militarized boundaries. Their goal is not to eliminate the cross-border movement of clandestine transnational actors but to impose costs on would-be infiltrators and in so doing deter or impede infiltration. This paper introduces a novel dataset encompassing all pairs of contiguous states worldwide. Of these 635 dyads, 45 are separated by fortified boundaries. We find that states are building fortified boundaries at an accelerating rate. Barriers tend to be built by one authoritarian country against another. Over half of the barrier builders and over three quarters of their targets are Muslim-majority states or groups. We find no support for the thesis that fortified boundaries are routinely constructed as an attempted land grab but we also find no evidence that states who build barriers have experienced a disproportionate number of terror attacks. Instead, the data show that differences in state wealth and migration rates are the best predictors of barrier construction. We conclude with hypotheses about the effectiveness of fortified boundaries. Throughout, our argument is illustrated with detailed case studies, ranging from the Moroccan Berm to the Israeli West-Bank barrier.

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Barriers to Entry: Who Builds Fortified Boundaries and Why?

In October 2006, President George W. Bush signed a bill authorizing the construction of a 700-mile fence along the U.S.-Mexico border. The barrier, consisting of reinforced fencing, cameras, lighting and sensors, was designed to stem the flow of illegal immigrants and smugglers into the United States. Critics were quick to attack the feasibility of the project on three primary grounds: expenditure, complexity and effectiveness. Several barrier opponents argued that the costs of constructing the fence, at an estimated $1-2 million dollars per mile, would be prohibitive. Others doubted the feasibility of the project given the challenges posed by border length and terrain. The most vocal group of opponents expressed skepticism over the effectiveness of a fence,

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arguing that illegal immigrants would be able to circumvent the barrier with ease by climbing over it, digging under it or cutting through it.\textsuperscript{6}

The passion with which both proponents and opponents of the US-Mexico border wall cling to their views is surprising given how little we actually know about these barriers. In this paper we present a novel database of similar barriers around the world, analyze the conditions under which such barriers are constructed, and hypothesize about their effectiveness.

In the first part of this paper, we elaborate the concept of “fortified boundaries,” which are asymmetrical, physical barriers for the purposes of border control. These boundaries are more formidable in structure than conventional boundary lines but less robust than militarized boundaries. Their goal is not to eliminate the cross-border movement of clandestine transnational actors (CTA’s) but to impose costs on would-be infiltrators and in so doing deter or impede infiltration. The states that construct fortified boundaries tend to do so unilaterally. We illustrate these characteristics by describing a paradigmatic case: the fortified boundaries around the Spanish enclaves of Ceuta and Melilla in Morocco.

In the second part of this paper, we review the literature pertaining to borders and boundaries, and offer some preliminary speculation on state motives for the construction of fortified boundaries. Our analysis throughout is both state-centric and rationalist: We assume that states are unitary actors that engage in cost-benefit analyses prior to

constructing fortified boundaries.\textsuperscript{7} We illustrate the process of deliberation that leads to barrier construction by means of a second detailed case study that explores the Israel-West Bank barrier.

Third, we introduce a novel dataset encompassing all pairs of contiguous states worldwide. Our data include a range of economic and demographic variables for the years 1995 and 2000. To distinguish builders from targets and account for the existence of reciprocal fortified boundaries, we list each dyad twice in our dataset, yielding 635 dyads, of which 45 are separated by fortified boundaries.\textsuperscript{8} These data illustrate several points. First, states are building fortified boundaries at an accelerating rate. Half of all post-World War II barriers were initiated after 2000. Moreover, several of these barriers cover greater distances, traverse more challenging terrain, and place a far greater burden on the finances of the initiating states than the proposed U.S.-Mexico border fence. Second, we show that while barrier builders tend to be considerably richer than barrier targets, they are not freer or more democratic than target states. Finally, our data reveal that Muslim-majority states are more likely to be the targets of fortified boundary construction than other types of states.

The fourth part of this paper presents a multivariate analysis of these data. We find no evidence for the thesis that fortified boundaries are routinely constructed as an attempted land grab but we also find no evidence that states who build barriers have experienced a disproportionate number of terror attacks. Instead, the data show that

\textsuperscript{7} This distinguishes our analysis from studies that emphasize the role of domestic political interests and constraints on border policy. See George Gavrilis, \textit{The Dynamics of Interstate Boundaries} (Cambridge: Cambridge University Press, 2008); and Peter Andreas, \textit{Border Games: Policing the U.S.-Mexico Divide} (Ithaca: Cornell University Press, 2009).

\textsuperscript{8} We exclude islands that do not share land borders with other countries.
differences in state wealth and migration rates are the best predictors of barrier construction.

In the fifth part of this paper we consider the difficulties in assessing the effectiveness of fortified boundaries. The paucity of data on the stopping power of barriers, the challenge in posing counterfactuals and the problem of selection bias all encumber the analysis of fortified boundary success. Moreover, even obviously successful barriers can create long-term reputational costs and provide disincentives for compromise, a dilemma illustrated by Moroccan construction of the Western Sahara Berm.

We propose two hypotheses regarding the effectiveness of fortified boundaries in the sixth part of this paper. First, we expect the effectiveness of a barrier to increase as a function of a state’s ability to control the territory on both sides of the barrier. Second, we expect effectiveness to decrease if CTA’s can find alternative routes for crossing into the state that circumvent the fortified boundary. These hypotheses result in a fourfold typology of fortified boundaries by effectiveness. We suspect that the most effective fortified boundaries will be found where the initiating state controls the territory beyond a boundary that blocks the only route of access into the state. The fourth and final case study in this paper, the Morice Line, designed by the French in 1957 to prevent insurgent infiltration into Algeria, exemplifies this kind of robust barrier.

1. Defining Fortified Boundaries

Fortified boundaries share three qualities that distinguish them from other types of borders or fortifications. First, their primary function is border control, not military
defense or territorial demarcation. Second, they are physical barriers as opposed to virtual, symbolic or declaratory boundaries. Third, they are asymmetrical in origin and intent. These interrelated characteristics deserve closer scrutiny.

Unlike military fortifications or defenses, such as the French Maginot Line or its German counterpart, the Siegfried Line, fortified boundaries serve a law enforcement function. Their goal is not to deter or impede a conventional military assault but to prevent the cross-border flow of what Peter Andreas has termed “clandestine transnational actors.” Actors targeted by a fortified boundary can range from the relatively innocuous, such as unauthorized immigrants or refugees, through traffickers in drugs, weapons or humans, to more imminent security threats such as spies, insurgents, or terrorists.

Fortified boundaries impede CTA movement by imposing costs on those seeking to cross a border, thus deterring or dissuading would-be infiltrators. At the same time, fortified boundaries should not be expected to stop CTA’s cold. Barrier critics who emphasize successful instances of infiltration thus misstate the purpose of barrier construction and, in so doing, critique a straw-man argument. Fortified boundaries are merely designed to dissuade CTA’s from attempting to cross a particular border at a particular location or to slow the movement of CTA’s so as to increase the chances of their being apprehended by security forces. This reasoning applies even where fortified boundaries resemble fences more than walls and leave gaps through which individuals might pass. Even a simple barrier can impede CTA movement or encourage potential

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infiltrators to follow more circuitous or costly routes. Partial barriers that redirect movement to as-yet unprotected parts of the border relieve the barrier builders of the burden of having to survey the entire border and increase the odds of apprehending infiltrators. CTA’s may attempt to breach barriers but such efforts require significant coordination, impose costs on CTA’s, draw attention to their presence, and result in temporary success, at best.

Because fortified boundaries are designed for policing the movement of individuals across a border, they are less robust than military fortifications, built to prevent a border crossing by military personnel and militarized vehicles, yet more formidable than conventional boundary lines. In occupying the middle ground between the function provided by military fortifications and the functions provided by conventional boundary lines, fortified boundaries integrate physical elements from both types of borders. They tend to be composed of some combination of ditches, barbed wire, fences, walls and guard towers to form a moderate obstacle. Impervious to unarmed assault, they can withstand modest attacks by small or lightly armed groups long enough to provide advanced warning and allow for mobilization by security forces. Consequently, they tend to be patrolled by border police or semi-militarized units or, at the very least, are surveyed by electronic means.

We can imagine a continuum of border institutionalization in which military fortifications occupy one extreme. At the other extreme lie customary boundaries that have not been enshrined in law. Once delimited, boundaries become legal fictions that draw their authority from maps and treaties. The next step in the institutionalization of a boundary is demarcation, the representation of a boundary on the ground in some form,
be it a sign, a marker, or a fence. As the physical representation of a boundary is bolstered, it ceases to provide the merely symbolic function of declaring the location of a border and begins to form a physical impediment. This bolstering can be uneven across a single boundary line: some states can afford to demarcate or reinforce only small segments of the border or only significant border crossings, leaving the rest of their boundary open to population movements. Other states prefer non-physical means for securing their boundaries against the flow of goods and people, from economic borders established by means of tariffs, quotas and customs houses to virtual borders composed of surveillance and detection devices. In this paper, however, we use the term “fortified boundary” to refer exclusively to a border that has been reinforced, in whole or in large part, to form a physical obstacle.

The third characteristic of a fortified boundary, directly related to its function and appearance, is its asymmetry. Whereas the physical appearance of a fortified boundary serves to distinguish it from a conventional border, its asymmetrical nature helps to differentiate it from a militarized border. When states compete over territory, become embroiled in a boundary dispute or commence hostilities the outcome tends to be mutual border militarization. Although weaker states have a greater incentive to construct military fortifications along borders with superior neighbors, these neighbors are motivated to even the score by emulating the construction of defenses, leading to reciprocal (if sometimes uneven) militarization of the border.

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For a fortified boundary to arise, on the other hand, it suffices for one state to perceive a unilateral threat from CTA’s in a neighboring state. The threatened state will construct a fortified boundary if its neighbor is unwilling or incapable of stemming the flow of CTA’s across the border. The construction of fortified boundaries is thus a one-sided act in response to a unilateral threat, executed without the support of the target state, and often accompanied by protests from the target state. After all, in constructing a fortified boundary a state sends a clear message to its neighbor that the threat of CTA’s is overwhelmingly one-sided and that it perceives the neighboring state as uncooperative in stemming that threat.

**Case Study I: Ceuta and Melilla**

One contemporary case included in our dataset below, the fortified boundary around Ceuta and Melilla, merits closer analysis since it exemplifies the three characteristics of fortified boundaries on a small scale.

Ceuta and Melilla are two Spanish cities in Morocco, some 11 square miles and 8 square miles in size respectively. Both were retained as autonomous enclaves by Spain in 1956, despite Spain’s recognition of Morocco’s independence. After Spain’s accession to the Schengen Agreement in 1995, the border between Spain and Morocco in Ceuta and Melilla created tempting opportunities for migrants and smugglers to access the European mainland, a mere eight miles away. The resulting spate of illegal border crossing into Spain prompted Spanish authorities to construct fences around Melilla and

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Ceuta in 1998 and 2001 respectively.\(^{13}\) Each city was surrounded by two parallel fences enclosing the city perimeters. The ten foot-tall fences were topped with barbed wire and equipped with spotlights. Sound sensors, motion sensors and cameras along the fence were connected to central hubs via miles of underground cables. The road between the two fences was patrolled by officers from the Spanish \textit{guardia civil} as well as regular police, amounting, in the case of Ceuta, to well above one-thousand patrolling officers. Coastal access to the enclaves was guarded by means of a dozen patrol boats.\(^{14}\) The Ceuta fence alone cost $350 million, subsidized by the European Union.\(^{15}\)

The fortified boundaries around Ceuta and Melilla dramatically reduced the number of illegal immigrants that succeeded in crossing into Spanish territory. In 1999 and 2000, before the Ceuta fence was completed, about ten thousand African migrants crossed the border illegally every year and demanded Spanish asylum from within the city. That number fell to about two thousand yearly asylum seekers in 2001 through 2003. By 2004, there were only 129 African migrants in Ceuta requesting asylum.\(^{16}\)

Nonetheless, critics of the fortified boundaries around Ceuta and Melilla pointed to a constant flow of persons and goods “over, underneath, through or around” the fences and judged the walling-off of the two cities to be “more apparent than real.”\(^{17}\) Indeed, in September 2005, the fortified boundaries around Ceuta and Melilla were put to test when thousands of immigrants attempted to charge the fences in several coordinated attacks.

\(^{17}\) Andreas (2009), ibid., pp.135-6.
The smaller assault on the Ceuta fence left some eighteen migrants dead, including two that had managed to cross onto the Spanish side. The massive attacks on the Melilla fence left six migrants dead but one thousand immigrants managed to break through the fence.\textsuperscript{18} In consequence, the Spanish government ordered the construction of a third fence around Melilla at a cost of $47 million. The three fences, each about seven miles in length, were also raised to a height of twenty feet to hamper the use of steps and ladders by assailants. These policies have halted all attempts at massive border crossings in Ceuta or Melilla.\textsuperscript{19}

The fortified boundaries around Ceuta and Melilla are paradigmatic of the types of borders we examine in this paper. They are international boundaries that have been bolstered to provide enhanced border security against CTA’s. Although they pose successful barriers to the cross-border movement of peoples and goods, they do not amount to military fortifications and would not withstand even the slightest assault by Moroccan military forces. Their purpose is asymmetric: There has been no need for Morocco to fortify its side of the border since there is no illegal immigration from Spain into Northern Africa. Finally, although the borders were fortified with policing concerns in mind, the Moroccan government has protested the construction and expansion of the fences because it continues to claim these territories as its own.

In sum, fortified boundaries can be distinguished from conventional interstate boundaries by virtue of their physical appearance, which is designed to enhance border control. Fortified boundaries are distinct from militarized boundaries because of their asymmetrical origin and intent. Salient historical cases of fortified boundaries include

\textsuperscript{19} Wellshe, ibid.; Winter, ibid.
the Great Wall of China (started in the 5th century BCE), the Roman *limes* (including, most famously, Hadrian’s Wall in northern England, constructed in the 1st century A.D.), Offas Dyke between Wales and England (8th century), and the Danevirke in Schleswig-Holstein (9th century).

2. Theorizing Fortified Boundaries

Scholarly research has had relatively little to say about why a state might build a fortified boundary, preferring instead to focus on the significance of borders more generally. At the risk of oversimplification, we can identify two overarching schools of thought. One tradition elides the physicality of borders, preferring instead to emphasize the symbolic functions of boundaries rather than their impact on state power, resources and security.20 In these analyses, boundaries are treated as institutions that take part in a global system of ordering, construct differences and mobilize identities, rather than as obstacles to the movement of peoples and goods.21

A second school at least implicitly acknowledges the physical function of borders, but views them as ineffective. The globalization literature, for example, emphasizes the permeability and increasing irrelevance of boundaries, at times going so far as to


prophesize their ultimate demise. Similarly, the literature on non-state actors has sought to highlight the ease with which immigrants, refugees, smugglers, insurgents and terrorists can cross boundary lines. Although the study of boundary fortifications was a major topic of research prior to World War II, the consensus among scholars of post-war military technology is that technological progress has favored offensive weapons and offensive doctrine, relegating old-fashioned fortifications, like the infamous Maginot Line, to the dustbin of history.

The emphasis on transnational threats unhindered by state borders has led international security scholars to focus on boundaries in the context of militarized interstate conflicts, offering little insight about the effectiveness of borders in repelling


non-state actors.\textsuperscript{26} Paradoxically, then, the combined effect of the neglect of borders by both students of globalization and international security scholars is to open a space for an analysis of why fortified boundaries get built and, ultimately, their effectiveness against insurgents, immigrants and smugglers.

Why, then, do states erect fortified boundaries? We identify two broad schools of thought that differ in the motives each imputes to the building state. One group of explanations sees states as interested primarily in the power of barriers to stop CTA’s from crossing borders. If that is the state’s motive, then fortified boundaries would get built under three conditions. First, states would initiate the construction of fortified boundaries when leaders perceive that unfortified borders no longer offer sufficient protection against CTA’s. Second, leaders must believe that these barriers can significantly reduce those unwanted flows. Third, leaders must feel that the benefits of barrier construction outweigh the costs. These conditions are consonant with most states’ justifications of their barriers, which are said to serve as a defense against some combination of insurgents, smugglers, undocumented migrants, and terrorists.

Under what conditions might a state perceive its neighbor as a source of unwanted cross-border flows, and therefore the potential target of a fortified boundary? Dramatic differences in wealth and economic opportunity between neighboring countries might propel states to contemplate barrier construction, as it did along the U.S.-Mexico border and around Ceuta and Melilla. We would expect wealthier countries to build fortified boundaries against their poorer neighbors. Another, related condition might be a

significant difference in freedom and political opportunity between two neighbors. We might expect freer countries to erect barriers against political migrants. Finally, we would expect fortified boundaries against states suspected of harboring terrorists.

A second school of thought imputes a different motive to states, and highlights alternative political agendas for their construction. Fortified boundaries create highly visible “facts on the ground” which can become a source of tension, particularly when the presence of CTA’s coincides with boundary disputes. Whereas a state may intend the construction of a fortified boundary as a defensive act, aimed at reassuring its domestic audience, others may interpret its appearance as a declaratory act, designed to assert the location of a disputed boundary to a foreign audience. Moreover, since the course of a fortified boundary is determined in large part by law enforcement needs and not by legal, humanitarian or environmental considerations, its construction may meet increasing opposition from a wide variety of affected audiences, including individuals who might respond with acts of terrorism. For this group of explanations, then, fortified boundaries actually magnify the problem they are allegedly intended to resolve.

Case Study II: The Israel-West Bank Barrier

Nowhere has the decision to construct a fortified boundary proven as controversial as in the case of the Israeli separation barrier along the West Bank. The originator of the idea to construct a physical barrier between Israel and the West Bank was Israeli Prime Minister Yitzhak Rabin. In a series of public addresses in the early 1990s, each following a spate of terror incidents, Rabin called on Israelis to consider
physical separation from the Palestinians. Rabin also established an inter-ministerial committee to discuss the construction of a security barrier separating the two communities, ordered the construction of short wall segments designed to prevent sniper fire from Palestinian towns into Israel, and directed that all access routes into Israel from the West Bank be either blocked or controlled by checkpoints.

The current barrier’s immediate predecessor was Israel’s Gaza Fence. The Gaza fence was a continuous obstacle, 45 kilometers long, that was constructed by Israel in 1994 on the occasion of transferring Gaza to Palestinian control as mandated by the Oslo Accords. Palestinian activists succeeded in dismantling segments of this fence in December 2000, but it was rebuilt by March 2001, at a cost of $2.5 million dollars, with improved security features. The new fence was 12 feet high, equipped with sensing equipments and punctuated by watchtowers and pillboxes, armed with machine guns, motions detectors, and night vision capability. Its buffer zone was expanded from one thousand feet to half a mile, patrolled by armored vehicles and unmanned aircraft. This new fence was said to have achieved “near-total containment of terrorism.”

Statistics gathered by the Israeli government suggest that not a single Palestinian suicide bomber succeeded in infiltrated Israel from Gaza between 2001 and March 2004. The head of the IDF’s Southern Command at the time, Major General Doron Almog, counted 400

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27 Responding to the first significant wave of terror attacks towards the end of the first Palestinian uprising in 1992, Rabin declared that Israel “must take Gaza out of Tel Aviv” and curtailed Palestinian worker access to Israel. Yet another string of terror attacks led Rabin to propose that Israelis “have to decide on separation as a philosophy.” After a terror attack claimed the lives of 21 Israelis, Rabin declared that “The path must lead to separation.” David Makovsky, “Rabin: We Need Border with Palestinians,” Jerusalem Post, October 20, 1994; “Rabin: Peace ‘Must Lead to a Separation’ between Israelis and Palestinians,” Mideast Mirror, January 24, 1995, cited in Makovsky, A Defensible Fence: Fighting Terror and Enabling a Two-State Solution (Washington, D.C.: Washington Institute for Near East Policy, April 2004), p.4.


attempts by Palestinians to cross the fence between 2000 and 2003, all of which are said to have failed.\textsuperscript{30}

The perceived success of the Gaza fence led the Israeli public to conclude that physical barriers could stop Palestinian terrorism.\textsuperscript{31} Rabin’s successors, however, were hesitant to construct a barrier between Israel and the West Bank. Any West Bank barrier would have to be six times as long as the Gaza Fence, traversing both rugged and urban terrains, including the city of Jerusalem. Several analysts raised fears of a “substitution effect”: The Gaza Fence had raised the number of Israeli fatalities within the fenced-in strip and had led Palestinian to adopt alternative tactics, such as resorting to ballistic and mortar attacks.\textsuperscript{32} Rarely, terrorists had succeeded in infiltrating from Gaza by passing checkpoints undetected or by tunneling under the fence.\textsuperscript{33}

Prime Minister Ehud Barak revived the idea of a physical barrier in 1999. Barak vowed to build “a physical separation” between Palestinians and Israelis and ordered Deputy Defense Minister Ephraim Sneh to propose the location for a partition line.\textsuperscript{34} By 2001, when Ariel Sharon replaced Ehud Barak as Prime Minister, a dramatic escalation in suicide attacks had created a groundswell of support in Israel for a physical barrier to stop terrorist movement. One poll in this period found 83 percent of Israelis in support of


\textsuperscript{32} Frish, ibid., pp.15-16; Brom and Shapir, ibid.


physical separation from the Palestinian territories.\textsuperscript{35} Grassroots movements, such as the “Fence for Life” organization, mobilized to protest, lobby parliament and file suits at the Supreme Court demanding a security fence.\textsuperscript{36} Some settlements in the West Bank began building their own improvised fences.\textsuperscript{37} Sharon, one of the staunchest opponents of the barrier, resisted these pressures fearing that physical separation would create a de facto Palestinian state in the West Bank.

Increased public pressure eventually forced Sharon’s hand. In a “seismic shift”, he advocated a policy of unilateral withdrawal from the Palestinian territories.\textsuperscript{38} In June 2001, he established a national security steering committee that proposed a temporary measure: three discontinuous barriers against motor vehicles “to prevent the penetration of terrorists from the area of Judea and Samaria into Israel.”\textsuperscript{39} A car bomb attack in June 2002 that killed seventeen Israelis brought the total number of Israeli fatalities from Palestinian attacks during the second Intifada to 500, persuading the Israeli government to opt for a more extreme measure. That month, the Israeli cabinet approved the first stage of a contiguous barrier designed to surround the entire West Bank. Subsequent stages passed approval in December 2002 and September 2003.\textsuperscript{40} The barrier is projected

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\textsuperscript{37} David Ratner, “Gilboa Towns build DIY Separation Fence,” Ha’aretz, December 17, 2002.


\textsuperscript{39} Beit Sourik Village Council v. Government of Israel, High Court of Justice Case HCJ 2056/04 (“Beit Sourik Case”), section 3; Lein, ibid., p.4; Frisch, ibid., pp.9-10.

\textsuperscript{40} Beit Sourik Case, ibid., sections 3-6.
to extend 450 miles at an estimated cost of $1 to $2.5 million per mile. By July 2009, about sixty percent of the barrier had been completed leaving two large gaps in the south and southwest of the West Bank.

The barrier is composed of a multi-layered system that includes chain-link fences, electronic sensors, tracking paths, barbed wire, and the several segments composed of concrete walls. Its primary component is an electronic fence, equipped with intrusion detection equipment, bordered in the east by a road, barbed wire, and a trench (to prevent vehicles from crashing through the fence). On its west the primary fence is bounded by three paths: a trace road (intended to reveal footprints), a patrol road and a road for armored vehicles. “Depth barriers” east of the primary barrier, consisting of trenches and barbed-wire, are designed to direct movement to security control points. The average width of the barrier is 150 feet, though some sections of the barrier reach 300 feet, depending on topographic constraints. About 6% of the total barrier length will be constructed out of 25-foot tall concrete slabs, 10 feet wide. These sections are concentrated in urban areas and are designed to block sniper fire. The barrier is protected by observation posts at regular intervals. Its gates are controlled by Israeli soldiers, while the entire length of the barrier is patrolled by soldiers and border police.

Israeli decision makers conceived of the barrier as a crucial component in a larger counter-terrorism strategy that includes security patrols, assassination of terrorist leaders,
infiltration of terrorist organizations, and efforts at targeting funding sources.\textsuperscript{46} The barrier was designed to raise the costs and risks of launching suicide attacks by forcing terrorists to follow a circuitous route in order to reach targets, thus providing security forces enough time to locate and arrest terrorists en route.\textsuperscript{47}

Proponents of the barrier have emphasized its success in dramatically reducing the number of suicide attacks in Israel. According to statistics published by the Israel Defense Forces, the yearly number of attacks fell from a high of sixty attacks (with 220 casualties) in 2002 to five attacks (with 5 casualties) in 2006.\textsuperscript{48} These figures are particularly notable given the reported rise in attempted attacks in this period.\textsuperscript{49}

The geographic distribution of successful attacks lends further credence to the effectiveness of the barrier, even in its incomplete state. As the length of various barrier segments increased, they gradually channeled attacks towards Israeli cities in the vicinity of gaps in the barrier, forcing perpetrators to either take longer routes to superior targets with an increased chance of being apprehended, or to select inferior targets.\textsuperscript{50} The Palestinian cities of Tulkarm and Qalqilya had served as the launching point for multiple suicide attacks against the Israeli city of Netanya, seven miles away, yet not a single attack originated from those cities after the barrier was constructed in their vicinity in

\textsuperscript{46} Nadav Morag, “Measuring Success in Coping with Terrorism: The Israeli Case,” \textit{Studies in Conflict and Terrorism}, Vol. 28, No. 4 (2005); and Frisch, ibid., p.15.
\textsuperscript{47} Morag, ibid.; and Baskin, ibid.,
\textsuperscript{48} The number of attacks and casualties reported for the intervening years is 23 attacks (142 casualties) in 2003, 15 attacks (55 casualties) in 2004, and 7 attacks (23 casualties) in 2005. “Anti-Israeli Terrorism, 2006: Data, Analysis and Trends,” Intelligence and Terrorism Information Center at the Israel Intelligence Heritage & Commemoration Center (IICC), March 2007, p.51. For alternative figures demonstrating similar trends, see Dion Nissenbaum, “Death Toll of Israeli Civilians Killed by Palestinians Hit a Low in 2006,” \textit{McClatchy Washington Bureau}, June 14, 2007; Amos Harel, “Shin Bet: Palestinian Truce Main Cause for Reduced Terror,” \textit{Ha'aretz}, January 2, 2006; Sagi Or, “Intifada’s 5\textsuperscript{th} Year Saw Lowest Death Toll,” \textit{Ha'aretz}, September 29, 2005; and Morag, ibid., p.310.
\textsuperscript{49} The IDF is said to have intercepted 96 potential suicide bombers in 2005 and 187 potential suicide bombers in 2006. Nissenbaum, ibid.
\textsuperscript{50} Morag, ibid., p.311; and Kliot and Charney, ibid., p.365.
July 2003.\textsuperscript{51} Statements by the heads of Palestinian terror organizations further attest to the obstacle posed by the barrier.\textsuperscript{52} For example, the leader of the Palestinian Islamic Jihad, Ramadan Abdallah Shalah, admitted that “it limits the ability of the resistance to arrive deep within [Israeli territory] to carry out suicide bombing attacks.”\textsuperscript{53}

Opponents of the barrier have argued that reductions in attacks since the construction of the barrier can be attributed to a cease-fire declared by Palestinian groups in 2006 and to IDF incursions into the West Bank starting in 2002 that disrupted militant planning.\textsuperscript{54} Critics have also argued that, prior to the construction of the barrier, most terrorists did not enter Israel through open areas but through checkpoints, where they underwent faulty security screenings. These vulnerability of these checkpoints, argue critics, obviate the utility of the barrier.\textsuperscript{55}

3. Who Builds? Data and Descriptive Statistics

Table 1 lists all fortified boundaries built since 1945, sorted in order of the date in which boundary construction began, though these data are not always known with precision. The table also includes information on the approximate length of the fortified boundary, its alleged purpose (based on statements by representatives of the building state), and an estimate of our confidence in start date. Our dataset includes additional information not displayed in this table, such as the size, GDP, and regime type for both

\textsuperscript{51} Avi Dichter, “There is Life after Terror,” speech presented at the Fourth Annual Herzliya Conference, December 16, 2003; and Makovsky, ibid., p.55.
\textsuperscript{52} Report by the Intelligence and Terrorism Information Center at the Israeli Intelligence Heritage and Commemoration Center (IICC), March 26, 2008.
\textsuperscript{53} Ibid., citing \textit{Al Sharq} (Qatar), March 23, 2008.
\textsuperscript{55} Lein, ibid., p.29, citing Israel’s State Comptroller, \textit{Audit Report on the Seam Area} (in Hebrew), Report No. 2 (Jerusalem, July 2002), p.35.
builder and target states, and the estimated cost of barrier construction. The asterisk accompanying some barrier lengths indicates some uncertainty in the estimate.

Table 1: Post-1945 Fortified Boundaries

<table>
<thead>
<tr>
<th>Builder-Target</th>
<th>Start Date</th>
<th>Length (km)</th>
<th>Stated Target</th>
<th>Confidence in Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. USSR (E Germany)-W. Germany (Inner German Border)</td>
<td>1952</td>
<td>1408</td>
<td>Fascism</td>
<td>HIGH</td>
</tr>
<tr>
<td>2. France (Algeria)-Tunisia</td>
<td>1957</td>
<td>285</td>
<td>Insurgents</td>
<td>HIGH</td>
</tr>
<tr>
<td>3. USSR (E. Germany)-W. Germany (Berlin Wall)</td>
<td>1961</td>
<td>155</td>
<td>Fascism</td>
<td>HIGH</td>
</tr>
<tr>
<td>4. Israel-Lebanon</td>
<td>1975?</td>
<td></td>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td>5. South Africa-Mozambique</td>
<td>1976</td>
<td></td>
<td></td>
<td>MODERATE</td>
</tr>
<tr>
<td>6. USSR-Norway</td>
<td>1976?</td>
<td></td>
<td></td>
<td>VERY LOW</td>
</tr>
<tr>
<td>7. USSR-Finland</td>
<td>1978?</td>
<td></td>
<td></td>
<td>VERY LOW</td>
</tr>
<tr>
<td>9. Morocco-Western Sahara</td>
<td>1980</td>
<td>1700*</td>
<td>Militants</td>
<td>HIGH</td>
</tr>
<tr>
<td>11. Egypt-Gaza</td>
<td>1982</td>
<td>11</td>
<td>Smuggling</td>
<td>HIGH</td>
</tr>
<tr>
<td>12. Israel-Syria</td>
<td>1984?</td>
<td></td>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td>13. South Africa-Swaziland</td>
<td>1985?</td>
<td></td>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td>15. Thailand-Cambodia</td>
<td>1987?</td>
<td></td>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td>16. USSR (Hungary)-Austria</td>
<td>Pre-1989?</td>
<td></td>
<td></td>
<td>VERY LOW</td>
</tr>
<tr>
<td>17. Uzbekistan-Afghanistan</td>
<td>Pre-1989?</td>
<td>137</td>
<td></td>
<td>LOW</td>
</tr>
<tr>
<td>18. Romania-Hungary</td>
<td>1989</td>
<td></td>
<td></td>
<td>MODERATE/ HIGH</td>
</tr>
<tr>
<td>20. India-Bangladesh</td>
<td>1989-1994</td>
<td></td>
<td>Immigration, Illegal Activities</td>
<td>MODERATE</td>
</tr>
<tr>
<td>23. Israel-Gaza</td>
<td>1994</td>
<td>52</td>
<td>Terrorism</td>
<td>MODERATE/ HIGH</td>
</tr>
<tr>
<td>24. Kuwait-Iraq</td>
<td>1994</td>
<td>203</td>
<td></td>
<td>MODERATE</td>
</tr>
<tr>
<td>25. Spain (Ceuta)-Morocco</td>
<td>1995</td>
<td>8</td>
<td></td>
<td>HIGH</td>
</tr>
<tr>
<td>26. Spain (Melilla)-Morocco</td>
<td>1998</td>
<td>10</td>
<td></td>
<td>HIGH</td>
</tr>
</tbody>
</table>
One striking feature of Table 1 is the apparent acceleration in the rate of barrier construction over time, from only two during the 1950’s to fifteen since the year 2000. We illustrate this pattern in Figure 1. Although the increase in barrier construction is not monotonic, the trend is clearly increasing over time. Moreover, at least since the 1990’s the fences have become significantly more ambitious in terms of their length. We discuss further below some potential reasons for the spread in barrier-building.
Figure 1: Number of separation barriers initiated and total length of barriers constructed, by decade.

Table 2 compares building states with target states. This table strongly suggests that builders face a greater human influx than targets.\textsuperscript{56} First, building states are significantly richer than target states. The average GDP per capita for builders is $8,608 versus only $2,082 for target states.\textsuperscript{57} This is consistent with the idea that building states seek to limit the influx of economic migrants. At the same time, however, there is not much of a difference between builders and targets in the percentage of the population below the poverty line. This result could, of course, be due to differing definitions of “poverty” across countries. Second, although builders are more democratic than targets in

\textsuperscript{56} We exclude Europe from this analysis because within much of that region states are not free, by prior agreement, to erect fortified boundaries even if they wanted to. We drop barriers that were erected before 1989 so that the values of our explanatory variables better correspond with the actual situation at the time barriers are erected.

\textsuperscript{57} Measured in dollars for the year 2000 using purchasing power parity.
relative terms (4.5 versus 5.6), the average builder is still authoritarian in absolute terms. Barriers tend to be built by one authoritarian country against another. Third, over half of the barrier builders and over three quarters of their targets are Muslim-majority states or groups, whether or not Europe is included in the calculation. Of twenty-nine barriers built worldwide since 1990, twenty-two were constructed against Muslim-majority targets. Of those twenty-two, fourteen, or 63 percent, were also initiated by Muslim-majority states. Thus, nearly 50 percent of post-1990 walls separate Muslims from Muslims.

Table 2: How do builders differ from targets?

<table>
<thead>
<tr>
<th></th>
<th>Builder</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average GDP per capita, excluding Europe (PPP in 2000 $)</td>
<td>8608 (N=26)</td>
<td>2082 (N=22)</td>
</tr>
<tr>
<td>Average 2000 Freedom House score, excluding Europe (7 is most authoritarian)</td>
<td>4.5 (N=27)</td>
<td>5.6 (N=25)</td>
</tr>
<tr>
<td>Average % of pop below poverty line in 2000</td>
<td>33 (N=14)</td>
<td>30 (N=15)</td>
</tr>
<tr>
<td>Nominal Religion, excluding Europe, year 2000</td>
<td>55% of building countries Muslim (N=27)</td>
<td>81% of target countries Muslim (N=27)</td>
</tr>
<tr>
<td>Nominal Religion, including Europe, year 2000</td>
<td>52% of building countries Muslim (N=29)</td>
<td>76% of target countries Muslim (N=29)</td>
</tr>
<tr>
<td>Cumulative # of terror attacks endured from 1970 to 2000, excluding Europe</td>
<td>788 (N=27)</td>
<td>297 (N=25)</td>
</tr>
</tbody>
</table>

Sources: Military expenditure, ISSS; GDP per capita, World Bank; Freedom rating, Freedom House; Percentage of population below poverty line, CIA; nominal (majority) religion, CIA; Cumulative number of terrorist attacks, Global Terrorism Database.
One might account for the predominance of walls within and against the Muslim world by means of an economic logic. For example, one might argue that the unequal geographic distribution of petroleum has created a situation in which several wealthy Muslim states are bounded by poor neighbors. Several of these states have consequently constructed fortified boundaries, as have Saudi Arabia and the UAE against Yemen and Oman, respectively. Yet if economic differences between neighboring states were sufficient for one side to erect a barrier, then we ought to observe more such barriers worldwide than we actually do. No such barriers exist in Latin America, despite equivalent income disparities between relatively affluent Chile and its neighbors Bolivia and Peru; or, even more obviously, between French Guiana and any of its neighbors.

Samuel Huntington famously quipped that “Islam has bloody borders,” a reference to Muslim borders with the non-Muslim world. Our data suggest that the Muslim world is unique in its “barrier building” tendencies. Out of 148 bilateral intra-Muslim boundaries, 16, or roughly 11 percent, feature barriers. Perhaps the explanation lies in internal learning and emulation across Muslim regimes, who perceive one another to be sharing similar threats. This observation is consistent with a final pattern in the data visible in table 1: half of post-war barriers were built in or after the year 2000. Given the timing of much of this barrier construction, we speculate that this common threat might be that of terrorism. The last row of Table 2 supports the notion that barrier builders endure significantly more terror attacks than their targets, though these data do not include information on the source of the attacks. We address this problem in the next section.

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4. Who Builds? Multivariate Analysis

What factors best predict the erection of a fortified boundary? In table 3 we present the results of a series of logit models in which the dependent variable is dyadic, measuring whether or not a country initiated the construction of a fortified boundary along its border with a neighboring country at any point since 1989. As noted above, explanations for fortified boundaries can be divided into those that highlight alternative political agendas such as grabbing land, and those that emphasize the need to stem unwanted cross-border flows of CTA’s.

We employ multiple measures to distinguish between these two schools of thought. To test whether barriers are a means of territorial consolidation, we include a binary variable coded as 1 if there is a territorial dispute between a builder and a target and 0 otherwise (authors’ data). To test for barrier construction as a means for stemming CTA flows, we distinguish between political, economic, and terrorist cross-border flows. Our political explanatory variable is the difference in freedom between target and builder, as measured by Freedom House. If fortified boundaries are built to stop political refugees, we expect the occurrence of fortified boundaries to be correlated with differences in freedom. Our economic explanatory variables include the difference in gross domestic product (GDP) per capita between builder and target (from the UN), the rate of outmigration from the target (from the CIA), and the percentage of the target population below the poverty line as defined in the target country (from the CIA). If building fortified boundaries is about stemming the flow of those seeking better economic prospects, we expect a positive correlation between the existence of a barrier

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59 As before, we exclude Europe from this analysis and omit barriers that were erected before 1989. See note 55, above.
and wealth differences between builder and target that lead to population migration from the target to the builder.

Our terrorism explanatory variables include the cumulative number of terrorist attacks that a builder has endured (adapted from the Global Terrorism Database), the cumulative number of terrorist attacks launched from the a target to a builder (adapted from the ITERATE project), and a binary variable computed from the ITERATE data that indicates whether terrorism from target to builder has increased since 1990 or not. Each of these indicators implies a slightly different way in which building countries interpret terrorist attacks against them. Do builders decide to build based on the overall amount of terrorism they have endured, irrespective of where those attacks actually originate? If so, then there should be a positive correlation between the Global Terrorism Database cumulative attack numbers and the existence of a fortified boundary. Do builders keep tabs on which neighbors are the source of terrorism, and build fortified boundaries only against terrorist sources? If so then we should expect dyad-level terror attack counts from the ITERATE project to be positive correlated with the erection of such boundaries. Finally, do countries decide to build a fortified boundary by comparing the number of terror attacks they endure with the number other countries endure? Or do they take into account only their own experience with increasing numbers of attacks? If the former, we expect the cumulative number of attacks to be significant; if the latter, only the trend across time should matter.

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To compute this for each dyad we regress the yearly count of terror attacks between target and builder on year. Where the resultant slope coefficient is positive we code the trend as increasing (1); where the resultant slope is non-positive, we code the trend as 0.
To test the idea that nominally Muslim countries are inordinately the target of fortified boundaries we include a binary variable indicating whether the target country’s population is nominally Muslim or not (from the CIA). Finally, we control for the capacity of states to erect fortified boundaries. Many states might see a need for a fortified boundary but have neither the capacity nor the funds to erect one. Our measure of this capacity is builder’s GDP (from the UN) per kilometer of border with the target (from the US Census Bureau). We illustrate our results in Table 3, which displays the results of three different statistical models, each of which employs different indicators for economic factors and terrorism. Unless otherwise specified, explanatory variables refer to the year 2000.

Table 3: Logit model predicting separation barriers for barriers begun after 1989. Unless otherwise specified data explanatory variables are from the year 2000, and standard errors are robust and computed with clustering on target.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient (Robust SE)</td>
<td>Coefficient (Robust SE)</td>
<td>Coefficient (Robust SE)</td>
</tr>
<tr>
<td>Target Religion (0 =non-Muslim, 1= Muslim)</td>
<td>1.87*** (.69)</td>
<td>1.51*** (.55)</td>
<td>1.58*** (.70)</td>
</tr>
<tr>
<td>Difference in Freedom (1=most free, 7=least free)</td>
<td>.02 (.18)</td>
<td>-.25 (.16)</td>
<td>-.24 (.17)</td>
</tr>
<tr>
<td>Territorial Dispute in 1995?</td>
<td>.006 (.97)</td>
<td>-.04 (.81)</td>
<td>.35 (78)</td>
</tr>
<tr>
<td>Capacity--Builder GDP per km of dyadic border (millions of PPP $)</td>
<td>.00004** (.00002)</td>
<td>.00006*** (.00002)</td>
<td>.00003* (.00002)</td>
</tr>
<tr>
<td>Economic Factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difference in GDP per capita (current PPP $)</td>
<td>.0002*** (.00004)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Target migration rate (per 1000 population) in 2005</td>
<td>-</td>
<td>-.17* (.10)</td>
<td>-</td>
</tr>
</tbody>
</table>

61 Excludes Afghanistan due to very high levels of reported in-migration during the current war.
Although the magnitudes of logit coefficients are not directly interpretable or comparable with one another, we can draw four conclusions based on the signs of the coefficients. First, there is no evidence that states tend to erect fortified boundaries along disputed borders. There is no cross-national correlation between territorial disputes and the existence of fortified boundaries worldwide.

Second, our findings support the claim that states build fortified boundaries to stem unwanted cross-border flows stemming from differences in wealth between builder and target. This is true whether such differences are measured in terms of GDP per capita (between builder and target, model 1) or as migration rate from the target (model 2). The coefficient is negative on “Target migration rate (per 1000 population) in 2005” because negative migration rates indicate net outflow from the target. The negative coefficient thus implies a positive relationship between out-migration from a target and a builder’s fortified boundary. Though we do not include all the output, the relationship between the propensity of a builder to construct a fortified boundary and both difference in GDP per capita and target migration rates is robust to different model specifications. By contrast,
“Difference in freedom” has no explanatory power. It is not true that freer states build fortified boundaries against less free ones.

Third, although states often invoke the threat of terrorism as a reason for their fortified boundaries, there is virtually no statistical relationship between actual levels of terrorism and the propensity of states to construct such boundaries, even after controlling for the capacity of states to erect such boundaries (Capacity). This is true whether terrorism is measured in terms of an increasing trend within dyads since 1990 (model 1) or the cumulative number of terrorist attacks across dyads (from target to builder) since 1990 (model 2). There is a positive correlation in model 3 between the occurrence of a fortified boundary and the total number of domestic and transnational terrorist attacks endured by the builder since 1970 (“Cumulative # of terror attacks on builder”), suggesting that countries targeted by terrorism are more apt to build walls regardless of the source of those attacks. However, the correlation disappears when model 3 is estimated with a different economic factor. There are in fact several dyads in which there are significant numbers of recorded terror attacks from target to builder but no fortified boundary along their common border. For example, we would have expected fortified boundaries to separate Greece from Turkey, Turkey from Iran, Ecuador from Colombia, and Namibia from Angola, yet terror targets chose not to construct fortified boundaries in these cases.

Finally, our most robust positive result concerns the nominal religion of the target state. Predominantly Muslim states have an increased probability of becoming the targets of a fortified boundary, even after taking account of disparities of wealth, freedom, and experience with terrorism. This finding is consistent with the claim that building states
are justifying their fortified boundaries based on the potentiality of terrorism, and that such justifications are most warranted when the target state is Muslim. However, as noted earlier, this finding is out of line with Huntington’s thesis. Fourteen out of the twenty-two boundaries erected against Muslim states since 1990 were constructed by other Muslim states. If Israel is excluded from the dataset, then 75 percent of fortified boundaries constructed against Muslim states were built by other Muslim states.

5. The Challenge of Estimating Effectiveness

How might we measure *ex ante* the effectiveness of a fortified boundary? Since we define fortified boundaries as border control measures designed to ward off asymmetric, non-military threats, we define effectiveness in terms of the ability of a fortified boundary to prevent the influx of migrants, smugglers, and terrorists on the one hand and arms, goods, and diseases on the other. In other words, we are interested in assessing the stopping power of fortified boundaries.

Yet measuring effectiveness along these lines for the cases in our dataset is unfeasible, with a few exceptions. Governments, reluctant to provide information on the existence of their fortified boundaries, let alone on the parameters of these boundaries, have not been forthcoming in imparting data on illegal border crossings into their territories. Those regimes that have advertised the effectiveness of their fortified boundaries may well have done so to justify the construction of controversial fortifications, prompting us to suspect that data regarding success has been inflated.

Moreover, even where data on the stopping power of a fortified boundary is available, as in the case of the West Bank barrier, such data is insufficient for precise
measurement of boundary effectiveness. First, calculating the efficacy of a boundary requires some counterfactual measure of what the movement of peoples and goods across a given border would have been like had no fortified boundary been constructed. Measures of illicit movement pre-fortification might offer some estimate for this figure but these too can be difficult to acquire. Recent research regarding the Berlin Wall, for example, confirms that East German police killed between 100 and 200 individuals in the process of attempting to cross the wall in the period 1961-1989. Yet there exists no equivalent data for successful crossings, or crossings prevented by means short of bloodshed. Most importantly, there is no data on would-be crossers dissuaded from attempting to defect into Western Germany by virtue of the wall’s formidable presence.

A second challenge in attempting to determine the stopping power of a fortified boundary is that measuring the effectiveness of existing boundaries without attempting to assess the effectiveness of boundaries that have not been fortified would introduce a selection bias into our analysis. Most if not all states suffer from some form of unwanted cross-border traffic yet, as our dataset shows, only 45 boundaries worldwide have been fortified since 1945. Our analysis is thus skewed towards cases in which states, for one reason or another, chose to construct fortified boundaries. Since governments are likely to decide in favor of fortifying a boundary when they expect such fortifications to be effective, the analysis of already fortified boundaries can tell us little about the relative efficacy of fortification relative to alternatives.

Finally, any assessment of barrier effectiveness must ultimately account not just for its effectiveness at stopping CTA’s, but also its long-term strategic effects. Fortified

62 See data gathered by the Zentrum für Zeithistorische Forschung Potsdam (The Center for Contemporary Historical Research in Potsdam) at http://www.chronik-der-mauer.de/index.php/de/Start/Index/id/593792.
boundaries may provoke outrage by target states and others affected states or groups, with significant economic, political, or reputational costs for the builder. Such blowback is particularly likely to occur if the barrier is extensive, coincides with a boundary dispute, and is perceived as successful at the tactical level, all features shared by the bulk of cases in our dataset. Moreover, by alleviating short-term security risks and creating a viable status-quo, a successful fortified boundary can delay comprehensive dispute resolution, a cure for a symptom rather than the underlying disease. In restraining violence from escalating to war, a seemingly effective barrier may create disincentives for compromise, imposing long-term costs on builders and targets alike.

**Case Study III: The Moroccan Berm**

By way of illustration, consider the Moroccan Berm, a 2700 mile-long system of sand and stone walls, constructed by Morocco in the Western Sahara. The berm was designed to thwart incursions by the Polisario Front, an insurgent movement representing the indigenous Sahrawi population of Western Sahara. The berm crisscrosses 125,000 square miles of arid desert that is meager in oases, permanent rivers or arable land, and in which temperatures can reach 135°F in the summer months.63

The Moroccan government initiated construction in 1980, in response to a series of successful attacks by Polisario.64 Morocco sank an estimated 40% of its GDP into the berm’s construction and defense.65 It completed the construction project within six years,

65 *Arms Sales and the Conflict in Western Sahara: an Assessment of US Policy*, Hearing Before the Subcommittees on International Security and Scientific Affairs and on Africa of the Committee on Foreign
producing a 1700 mile-long external wall as well as four interior walls that dissect Western Sahara. The 7-foot tall walls are equipped with electronic sensors and radars, topped by barbed wire, and are flanked by a 23 foot-wide ditch as well as mine fields. The walls are punctuated, every 3 miles or so, by military bases, observation posts and underground bunkers.\(^{66}\)

Although the costs of maintaining a standing force of 100,000 troops along the berm placed a heavy burden on the Moroccan economy, it also enabled Morocco to resume phosphate extraction from the region at pre-conflict levels.\(^{67}\) While breachable, the berm made it increasingly difficult for Polisario to conduct raids, resulting in Moroccan military superiority. Its construction did not resolve the conflict between Morocco and Polisario but it eliminated Polisario incursions into Moroccan-held territories, leading to a cessation of violence since 1991. Polisario, which had controlled nine tenths of the Western Saharan territory before the berm was constructed, is now confined to a narrow strip of land, sandwiched between the berm and the Mauritanian border.\(^{68}\)

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\(^{67}\) By 1983, Morocco was exporting nearly 700,000 tons of phosphates, up from 150,000 tons prior to the construction of the berm. Hodges, ibid., p.13; Seddon, ibid., pp.105 and 108 and 122-4.

\(^{68}\) Erik Jensen, Western Sahara: Anatomy of a Stalemate (Boulder: Lynne Rienner, 2005), p.34; Hodges, ibid., pp.12-13; Ruf, ibid., pp.73-4.
6. Two Hypotheses on Barrier Effectiveness

Our analysis of existing barriers suggests two reasonable hypotheses regarding the short-term effectiveness of fortified boundaries. First, we expect the effectiveness of a fortified boundary to increase if it is coupled with other defensive measures against CTA’s. This hypothesis is based on the assumption that fortified boundaries cannot provide an effective barrier to cross-border traffic unless they are integrated into a broader repertoire of border control measures. Of those measures, the most crucial are means for protecting the fortified boundary itself. Absent such measures, CTA’s can circumvent the fortified boundary or even target the fortifications in an attempt to weaken or destroy them. The most effective means for a state to protect a fortified boundary is to control territory on both sides of the boundary. The wider the strip of land controlled by the state on the CTA side of a fortified boundary, the easier it will be for the state to preempt and prevent attempts at breaking through the boundary. Such control may entail cooperation or intelligence sharing with the state on the other side of the border, unilateral or bilateral surveillance, or the ability to use force on the other side of the border. The most extreme cases of such control involve states that are in effective occupation of the territory on the far side of the fortified boundary: The fortified boundaries erected by Israel are successful in large part due to the state’s ability to target CTA’s on both sides of the boundary.

Second, we hypothesize that fortified boundary effectiveness will decrease if CTA’s can find alternative routes for crossing into the state that circumvent the fortified boundary. CTA’s faced with a barrier along a particular boundary will seek alternative ways to enter a target state. Should they succeed, the fortified boundary would become
One of the primary reasons for skepticism regarding the effectiveness of a U.S.-Mexico border fence, for example, is the ease with which illegal immigrants from Mexico might enter the United States elsewhere, be it across the U.S.-Canada border or at any U.S. port and airport. Where a particular boundary holds monopoly over entry and egress, on the other hand, fortifications stand a better chance of deterring and preventing illicit movement. These hypotheses result in a typology of fortified boundaries of varying effectiveness [see table 4].

**Table 4: A Typology of Fortified Boundary Effectiveness**

<table>
<thead>
<tr>
<th>State lacks alternative control</th>
<th>State has alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weak</td>
<td>Intermediate</td>
</tr>
<tr>
<td>(Kazakhstan-Uzbekistan; Thailand-Malaysia)</td>
<td>(U.S.-Mexico; India-Pakistan)</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Robust</td>
</tr>
<tr>
<td>(Saudi Arabia-Yemen; Saudi Arabia-Iraq)</td>
<td>(Israel-West Bank; Morocco-Western Sahara)</td>
</tr>
</tbody>
</table>

Boundaries in the top left quadrant should prove the least effective: they are constructed by states as the only available means of deterring the cross-border movement of CTA’s, along one of multiple possible entry points for CTA’s. We should expect to see such relatively ineffective boundaries where states of limited means that lack the
ability to control both sides of a border attempt to secure the weakest of their boundaries. CTA’s are likely to respond by simply targeting the next weakest access point.

We expect boundaries in the bottom left and top right quadrants to be of somewhat greater effectiveness. States in the bottom left quadrant cannot operate on both sides of the relevant boundary but do control a primary CTA access point. CTA’s may find it easy to physically undermine the fortified boundary but will encounter difficulties seeking alternative access points. The ability of the boundary to withstand CTA assaults will thus determine whether the fortified boundary is effective.

States in the upper right quadrant are in the opposite position. They have some measure of control over CTA’s on both sides of the boundary. In the U.S.-Mexico case, for example, extensive security cooperation between the governments of the United States and Mexico enable these regimes to collude to some extent in preventing CTA access to the border. However, the ease with which these CTA’s can locate alternative means of entering the United States ensures that a U.S.-Mexico fence, while potentially effective in stemming border crossings along the southern border of the United States, will be of limited use in reducing the influx of illegal immigrants. Similarly, India is able to survey both sides of the Indi-Pakistani boundary and even conduct limited operations on the Pakistani side of that boundary. But the boundary is not the only pathway by means of which insurgents can enter India.

Only fortified boundaries in the bottom right quadrant are likely to be truly effective. The regimes constructing these fortifications have done so at the only significant point of entry for CTA’s, thus forcing their opponents to confront the fortified boundary. Yet they are able to defend not only their home territory by means of the
boundary but also the boundary itself by controlling territory on its far side. In addition to blocking the CTA’s path, these regimes confront CTA’s directly by means of intelligence gathering missions, cross-border raids, and aerial attacks. This integrated strategy makes it difficult for CTA’s to advance on, let alone destabilize, the fortified boundary.

**Case Study IV: The Morice Line**

The Morice Line, completed by French counterinsurgency forces in September 1957, exemplifies the potential resilience of a fortified boundary to infiltration. The line was designed to prevent Front de Liberation Nationale (FLN) guerillas, based, armed, and trained in Tunisia and Morocco, from entering Algeria. It stretched 285 miles along the Algerian border with Tunisia and 435 miles along the Algerian border with Morocco. The core of the line consisted of an 8-foot high electric fence, charged with 5,000 volts, and equipped with alarms, radars, and searchlights. It was flanked by barbed wire, patrol tracks and minefields extending 50 yards to each side. Sensors detected attempts at breaching the line and directed radar-guided artillery and mobile pursuit units, *commandos de chasse*, to the relevant sector.\(^{69}\) The line created a no-man’s land, under constant surveillance from land and air, transforming the FLN’s sanctuary into “a kind of closed hunting preserve.”\(^{70}\)

At the height of the French-Algerian conflict, in 1957-8, maintaining the integrity of the Morice Line became the foremost French priority while breaching it became the


FLN’s supreme objective. The former prevailed: despite repeated and escalating FLN attempts to overwhelm the line by means of novel tactics, ingenious tunneling, ramping, and wire-cutting tools, and brute numbers, the line held and decimated the FLN. According to French estimates, the percentage of infiltrations prevented rose from 35% in January-February 1958 to 60% the next month to 80% by the end of April 1958. In the first seven months after its completion, the line is said to have cost the FLN 6,000 men and 4,300 weapons. Overall, the line is estimated to have blocked 90% of all infiltrations.

In a final, desperate attempt to breach the line, FLN forces launched an all-out assault on two sectors of the line east of Souk-Ahras in April, throwing 820 men against the line. Of those, 620 were killed or captured, a “crippling… decisive defeat” for the FLN. The Battle of Souk-Ahras signified the last concerted FLN attempt to breach the Morice Line.

7. Conclusion

The proliferation of fortified boundaries shows no signs of abating. As one opinion editorial put it: “If good fences make good neighbors, then the world is experiencing an unprecedented outbreak of neighborliness.” The perceived success of the West Bank barrier, for example, has already prompted the construction of three additional barriers in the region. In preparation for its pullout from Gaza in 2005, Israel constructed a barrier along the border between Egypt and Gaza in order to curb arms

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71 Horne, ibid., pp.264-5.
72 Talbott, ibid., p.184.
73 Horne, ibid., p.266.
smuggling by Hamas from Egypt into Gaza. The 20-30 foot concrete and steel barrier includes electronic sensors and underground barrier to prevent tunneling.\(^75\) In late 2009, Egypt began construction of an underground steel wall on its side of the border with Gaza to sever hundreds of Hamas smuggling tunnels. The project, supported by the United States and France, is part of an Egyptian effort to stop smuggling into Gaza as well as prevent the infiltration of extremists from Gaza into Egypt. The 100-foot-deep barrier consist of steel tubes, 20 inches in diameter and 66 feet long, placed one above the other in an underground trench, as well as vertical steel beams pounded into the soil.\(^76\) And in March 2010, the Israeli government decided to build a barrier along its border with Egypt to prevent the movement of illegal immigrants into Israel. More than 15,000 such immigrants have entered Israel since 2005, mostly from Sudan and Eritrea.\(^77\)

This paper attempted to explain the increasing prevalence of this sub-species of inter-state border, the fortified boundary. More formidable than conventional borders but less robust than militarized boundaries, a fortified boundary is intended to thwart the flow on unwanted people and goods from a neighboring state. The US-Mexico border wall and the Israeli separation fence are the best-known contemporary examples, but we identify 45 such boundaries that have been built since 1945, roughly half of which have been


\(^77\) Nathan Jeffay, “Israel Builds Another Barrier, This One To Bar Illegal African Immigrants,” \textit{Forward}, April 5, 2010.
initiated since 2000. We find that rich countries tend to erect barriers against poor countries, and Muslim countries are the principal targets but also major builders of such barriers.

Analysts disagree on the reasons why states erect such barriers and whether they can ever be effective. We argue that there are good theoretical reasons to believe fortified boundaries can stem unwanted cross-border flows. First, clandestine transnational actors cannot walk through walls. Barriers substantially raise the cost of crossing a border illicitly. The French Morice Line surrounding Algeria and the Spanish walls around Ceuta and Melilla provide at least a partial illustration of the power of such boundaries to turn what had been a tide into a trickle. Second, effectiveness increases where fortified boundaries are integrated into a broader repertoire of border control measures. The most effective of these measures appears to be the control of territory on the far side of the fortified boundary. Both Morocco and Israel can prevent potential breaches of the berm and West Bank barrier, respectively, by targeting potential illegal entrants before they even reach the fortification. Third, effectiveness increases to the extent that entrants have no other choice but to enter through where the barrier is. This may be the case with the Saudi-Yemen border fortification, where there are few other avenues for entry.

Nonetheless, our hypotheses on barrier effectiveness and the resulting typology must remain in the realm of speculation: We lack even the rudimentary information necessary for slotting most of the cases we have identified into the appropriate quadrants in table 4. We hope that, as additional information about fortified boundaries becomes available and scholars engage in careful analyses of existing cases, our hypotheses will find some confirmation.