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Border Walls and the Economics of Crime

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Abstract

We estimate the causal effect of a large, plausibly random border fortification project on crime in Israel. The timing of border wall construction was staggered, disrupting smuggling access to some towns before others. Using data on the location of car thefts before and after fortification, we find a large deterrent effect in protected towns (41% decline) and substantial displacement to not-yet-protected towns (34% increase). For some protected towns, fortification also arbitrarily increased the length of preferred smuggling routes. These granular shocks to smuggling costs further deterred auto theft (6% drop per kilometer). Drawing on novel arrest records, we find that the displacement of crime to unprotected towns is not driven by labor relocation from protected townships. Instead, local criminal organizations in unprotected towns increased their participation in car theft. We also find evidence that wall construction induced substitution from cross-border smuggling to other forms of property crime where assets are liquidated in Israel.

JEL Codes: D23, I38, K42, L22, N45

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Introduction

There is growing appreciation of the empirical challenge of studying the economics of crime, especially criminals' sensitivity to the costs of illicit activity (Johnson, Guerette and Bowers, 2014). Following Becker (1968), much of this literature has focused on testing how crime varies with the costs of participation in unlawful activities. Given the intentional strategic deployment of anti-crime initiatives, causal estimates of crime elasticities are not straightforward (Nagin, 2013). To address this challenge, previous research has used plausibly random reallocation of police units to estimate the impact of policing on criminal behavior. Levitt (1997), for example, uses the timing of elections as an instrument for police presence; Klick and Tabarrok (2005) use changes in the terror alert system as an exogenous shock to police deployment in Washington, D.C.; Draca, Machin and Witt (2011) examine changes in security presence following the terrorist bombs that hit London in July 2005; and DiTella and Schargrodsky (2004) study the effect of shifts in policing in Buenos Aires after the 1994 Jewish community center bombing. Those studies all find that the level of crime decreases significantly in areas that receive additional police patrols.

Although past studies have undoubtedly advanced our understanding of the economics of crime, they focus primarily on identifying a partial equilibrium: the impact of localized police interventions on crime in targeted areas (Donohue, Ho and Leahy, 2015).[1] We advance this agenda by studying a more complete, general equilibrium of crime, where shocks to the costs of criminal activity in one market influence the intensity of crime in non-targeted communities. We study these spillover dynamics in Israel, where authorities constructed a physical barrier separating Israel from the West Bank in response to suicide attacks during the Second Intifada. This barrier had the unintended consequence of significantly increasing the costs of smuggling stolen vehicles from the Israeli (western) side of the Green Line (the "1967 border").[2] The construction of the wall was staggered in a manner unrelated to criminal activity, with Israeli northern townships receiving protection earlier than southern border towns. Among protected localities, the wall also blocked some, but not all, most-preferred smuggling routes. These features give us a unique opportunity to quantify the impact of trafficking disruption on criminal activity in protected and not-yet-protected towns.

To study the impact of the wall construction on crime, we assembled spatial data that precisely identifies the leading edge of wall completion across time and includes the location

[1] Two recent exceptions are Dell (2015) that studies crime spillovers and Donohue, Ho and Leahy (2015) that reanalyze data from DiTella and Schargrodsky (2004), yet allowing for crime displacement.

[2] The Green Line served as the de-facto border between Israel and the West Bank until the Israeli occupation of that area, following the 1967 Six-Day War.

of through-barrier checkpoints. We also collected detailed data from the Israeli police on the number of vehicles stolen per month at the locality (township) level from 1990 to 2013. We use the time period of the second Intifada (uprising) between September 2000 and January 2004—shortly before, during, and after the construction of the wall in the Northern part of the West Bank—to examine the effect of the border wall on crime rates. In addition, we collect highly disaggregated and detailed data on enforcement measures (in particular, data on all auto theft-related arrests which tracks the origins of perpetrators as well as the precinct of apprehension and, separately, prosecution) and terrorist bombings. Using these data, we are able to isolate the effect of the barrier on criminal activity from other factors that might explain changes in auto theft. We supplement our initial quantitative analysis by interviewing experts in law enforcement and reviewing detailed qualitative case studies related to auto theft. We use this qualitative information to inform how we study locality-specific shocks to the costs of crime—through disruption of most-preferred smuggling routes—and the methods we use for modeling the spatial extent and operations of gangs in Israel.

As mentioned, during the early phase of construction, only vehicles stolen from Northern localities had to be smuggled through barrier checkpoints, while criminal trafficking from otherwise unprotected border towns was uninterrupted. Similar to Donohue, Ho and Leahy (2015), we categorize localities into three groups—treatment (Northern) localities, control (Southern) localities, and remote "Outer" localities—to empirically distinguish between (local) deterrence and (global) displacement patterns. Using this categorization, we report four key findings regarding the spatial dynamics of crime.

First, we find that auto theft decreases in places protected by the wall (i.e., local deterrence), and increases at similar rates in localities adjacent to border areas where the construction hadn't taken place yet (i.e., global displacement). Our results are consistent with displacement theories of crime that anticipate the relocation of illicit activity when policy exposure is uneven and demand for the outputs of crime remains unchanged (Hakim and Rengert, 1981). These results highlight the importance of studying a general, rather than partial (localized), equilibrium of crime. A naive comparison of protected and unprotected areas would substantially overestimate crime reduction following the construction of a (limited) border wall.

Second, limiting our analysis to protected (treatment) localities, we estimate how responsive criminals are to granular, idiosyncratic (local) increases in smuggling costs (Chalfin and McCrary, N.d.). By forcing traffic in the post-construction period to pass through a limited number of checkpoints, the wall cut off a large number of most-preferred smuggling routes in the protected north. We use geo-coded road network data to estimate the path and length of these routes before and after construction of the Northern barrier. Because these smuggling disruptions were unintended and heterogenous, we use these locality-specific shocks to unpack treatment effect heterogeneity. We find that shifts in the intensity of localized theft are highly correlated with heterogenous changes to costs of smuggling cars in treated settlements. On average, each additional kilometer traveled due to route disruption corresponds to about 5.5% decrease in monthly car-theft in origin localities.

Third, we further explore displacement patterns by analyzing "where crime goes" after the limited construction of the border wall. Specifically, we propose a simple framework, developed at greater length below, suggesting that criminals respond not only to transit costs and time, and the associated risks of apprehension from cross-border smuggling, but also to 'carrying capacity' constraints and inter-group competition in areas where criminals operate. We test this logic by examining differential increases in auto theft in the unprotected southern border, and find robust evidence consistent with our framework.

Fourth, a core unaddressed question in the crime displacement literature is whether the relocation of crime is underpinned by labor movement or adjustment of incumbent enterprises. That is, whether crime spillovers are driven by criminals who are forced to reduce activity in newly protected areas and thus compensate by 'migrating' to unprotected places, or by criminal gangs who already operate in unprotected areas and expand their activity to meet unsupplied demand. We shed light on this question by tracing the geographic origins of criminals involved in the displacement of crime to unprotected border localities. The evidence suggests that surges in auto theft among Southern townships were driven by increased effort among local criminal organizations, rather than the relocation of criminals from protected townships. This is likely due to the high transaction costs of relocating organized criminal activity. Consistent with this logic, we further find suggestive evidence that Northern gangs respond to the loss of car theft revenue by increasing other forms of illegal activities, such as house break-ins. These four results, we believe, contribute to clarifying the industrial organization of organized crime in Israel, and beyond.

This study goes beyond the existing literature in several important aspects. Most significantly, as mentioned, we employ a general equilibrium of crime perspective, and model market interdependence empirically. In addition, our paper leverages a highly visible and disruptive intervention. That Israeli criminal gangs observed local changes and perceived them as increasing the cost of crime participation, allows us to unambiguously attribute changes in crime rates to the construction of a border wall (i.e., to the adopted policy). By contrast, past studies have had a hard time ascertaining whether potential offenders were indeed aware of such policies, especially when it entailed localized changes in police presence (Johnson, Guerette and Bowers, 2014). Moreover, our analysis of heterogenous effects in both protected and unprotected areas improve upon past studies that account for crime displacement (Donohue, Ho and Leahy, 2015; Gonzalez-Navarro, 2013).[3]

Our paper also contributes to the existing literature on the economics of crime by moving past a nearly exclusive focus on policing (MacDonald, Klick and Grunwald, 2016). Police deployment, however, is not the only government intervention that increases the opportunity costs of crime or the risk of apprehension (Clarke, 1983). For example, infrastructure projects, and especially defensive architecture such as border walls, can play an important role in shaping the costs of crime, especially those involving cross-border illicit activity (Gavrilis, 2008). Our study widens the scope of the current literature by examining the consequences of a large-scale infrastructure project, which impacted the ease of criminal access and flight from hundreds of townships. Importantly, the Israeli separation barrier is not unique in its scope and scale—there are currently sixty-two man-made border walls in the world. Twenty-eight of these border walls have been constructed since 2000 (Carter and Poast, 2017). Indeed, the Trump administration justifies its intention to build a wall along the border with Mexico as an efficient means to reduce the entry of illicit drugs and unlawful migrants to the USA. The insights of this paper thus have clear policy implications and are relevant to a broad, but often overlooked, set of situational factors that influence the economics of crime.

The structure of the paper is as follows. The next section provides background on auto theft in Israel, as well as the construction of the separation barrier, followed by description of data and estimation strategy. Then, we analyze the impact of barrier construction on economic crime in protected and not-yet-protected localities, focusing on deterrence and displacement. Afterwards, we deepen our understanding of auto theft displacement to unprotected areas, and examine whether criminals in protected areas relocate to unprotected places, or whether they increase production of other criminal activities close to home. We conclude by highlighting some of the implications of our study for understanding the economics of crime.

Auto Theft in Israel

Auto theft in Israel has been increasing since the mid-1980s, and is considered among the highest in the world (Schmil, 2013).[4] Several factors have contributed to this trend. First, the growth in the number of vehicles on Israeli roads during this period resulted in an increase

[3]Note that some hot-spot policing studies report that police operations reduced some forms of crime and did not merely displace them (Sherman and Weisburd, 1995; Braga et al., 1999; Weisburd et al., 2006), but this strand of research largely ignores concerns about simultaneity.

[4]Among more than 100 nations surveyed by the United Nations, Israel is one of top ten countries in per capita vehicle theft (Harrendorf, Heiskanen and Malby, 2010). From 2003 to 2013, the estimated average auto theft annual rate in Israel was 366 per 100,000 residents–slightly higher than the rate in the US (321 per 100,000 residents) Federal Bureau of Investigation (2013).

in the number of accidents, and increased the demand for replacement parts (Central Bureau of Statistics, 2015*a*,*b*). Second, the high level of taxation imposed on imported spare parts push Israelis to look for cheaper, albeit illicit, alternatives. Third, Israel's withdrawal from the main Palestinian cities of the West Bank following the Oslo Accord made it easier for chop shops to operate in these areas (Herzog, 2002*a*,*b*). Notably, about 80 percent of vehicles stolen in Israel are transported to the West Bank (State Comptroller, 2014).[5]

Auto theft is perpetrated by gangs, operating within "a well-established and organized criminal industry" (Herzog, 2002*b*, 716) that profits from trade in spare parts. These gangs are comprised of Palestinians from Israel and from the West Bank, and in some cases also involve Israeli Jewish criminals (Herzog, 2002*a*). In many cases, auto theft begins with an order to steal a specific brand of vehicle. Palestinians from the West Bank enter Israel in areas unprotected by checkpoints or barriers, or with the help of Israeli cab drivers, who meet them in the West Bank and drive them to Israel in taxis with Israeli license plates. Palestinian thieves are then joined by Israeli criminals, who assist them in stealing vehicles. The Israeli gangs that specialize in auto theft are based out of the so-called Triangle area,[6] especially the Israeli-Palestinian city of Taibeh (Harel, 2005). Prior to the construction of the separation barrier, stolen vehicles were transported to the West Bank mostly through uncontrolled and unpaved routes and in some cases using scouts to test police and soldiers' alertness.

Past studies suggest that auto theft patterns are responsive to security measures. Herzog (2002*b*,*a*) finds that auto theft rates dropped following terrorist attacks, when Israel implemented sudden and absolute temporary border closures that curtailed Palestinian movement from the West Bank into Israel. There is also some evidence that auto theft responds to changes in policing strategy. In 1997, Israel established a special police unit dedicated to auto theft, known by its Hebrew abbreviation ETGAR. ETGAR implements proactive prevention by targeting chop shops and auto dealers in order to reduce the demand and supply of stolen vehicle parts (Herzog, 2002*a*; State Comptroller, 2014). According to the State Comptroller (2014), between 1997 and 2004, the annual average number of stolen vehicles gradually dropped from about 45,000 to about 30,000. This trend was somewhat reversed following the temporary dismantlement of ETGAR in 2005 due to budget constraints, and auto theft that year increased by 20 percent compared to 2004. After ETGAR's reestablishment in 2006, auto theft again dropped. Policing was not the only measure implemented to

[5] Vehicles that are not transported to the West Bank are stolen by Israelis mainly for joy ride, insurance fraud purposes or to be used in other criminal activity. Among the vehicles transported to the West Bank, the majority is dismantled for spare parts. A small number of vehicles are sold in the West Bank or are transported to Jordan or Egypt, after chop shops forge identification information (Herzog, 2002*a*,*b*; Harel, 2005; Greenberg, 2005).

[6] A cluster of Arab-Israeli towns and villages on the border between Israel and the West Bank.

combat auto theft: the Israeli Parliament passed new legislation in 1998 (amended in 2000 and 2005) that bans the import of used automobile parts from the Palestinian Authority, makes it mandatory to mark used vehicle parts, and provides legal basis for ETGAR's activity against chop shops and auto dealers.[7]

Legislation and policing changes are one reason why we focus on the period between October 2000 and January 2004. First, EGTAR was fully operational during that period. Second, based on our conversations with sources in Israeli police, the above legislation had a strong bite only after the 2005 amendment; i.e., for the most part, the 1998 ban on stolen car parts was only enforced after 2006. This delay in enforcement and the fact that national policies represent a common shock across regions mean that the legal framework cannot explain regional variation in auto theft during the period examined in this paper. A separate but core reason to focus on the period from late 2000 to early 2004 is the staggered nature of wall construction in light of the outbreak of violence in October 2000 (this period is also known as the *Second Intifada* (Uprising)).

Separation Barrier

Three features of the Israeli barrier make it a well-suited case for examining the economics of crime. First, the construction of the barrier was exogenous to auto thefts. Second, the barrier increased both the risk of apprehension and the opportunity cost of engaging in auto theft activity, in some localities but not in others. Third, as discussed above, the visibility of the physical barrier makes the increased risk of apprehension salient, thereby increasing our confidence that changes in crime incidence are a rational response to situational measure externalities. We expand on these points in greater detail below.

The construction of a physical barrier between Israel and the West Bank was initially proposed in the mid-1990s in response to the wave of Palestinian suicide attacks in Israel and following the erection of a similar wall around Gaza strip in 1994 (Hassner and Wittenberg, 2015). This idea gained popular support with the outbreak of the Second Intifada in September 2000, and the escalation of Palestinian suicide attacks within Israel hereafter (Brom and Shapir, 2002). In April 2002, Israel's Security Ministerial Cabinet decided to establish a permanent barrier between Israel and the West Bank to "improve and reinforce the readiness and operational capability in coping with terrorism" (Lein, 2003). In June 2002, the government approved the route of the first 116 kilometers of the wall in areas of northern West

[7] The laws and amendments related to marking used parts are here: http://main.knesset.gov.il/Activity/Legislation/Laws/Pages/LawPrimary.aspx?lawitemid=2001128.

Bank (between Salem and Elqana) and around Jerusalem (Lein, 2003), and construction began immediately. In December 2002, the government authorized an eastward extension of the northern route between Salem and Faqu'a, and the construction there began in January 2003 (Lein, 2003). In August 2003, additional segments of the barrier were sanctioned in Jerusalem area (Israeli Ministry of Defense, 2016). Further components of the wall in the central and southern West Bank were approved in 2003-2005, but construction was delayed due to legal appeals of Palestinians against the proposed route, associated land confiscations, and, in several cases, because of environmental considerations (Hasson, 2015).

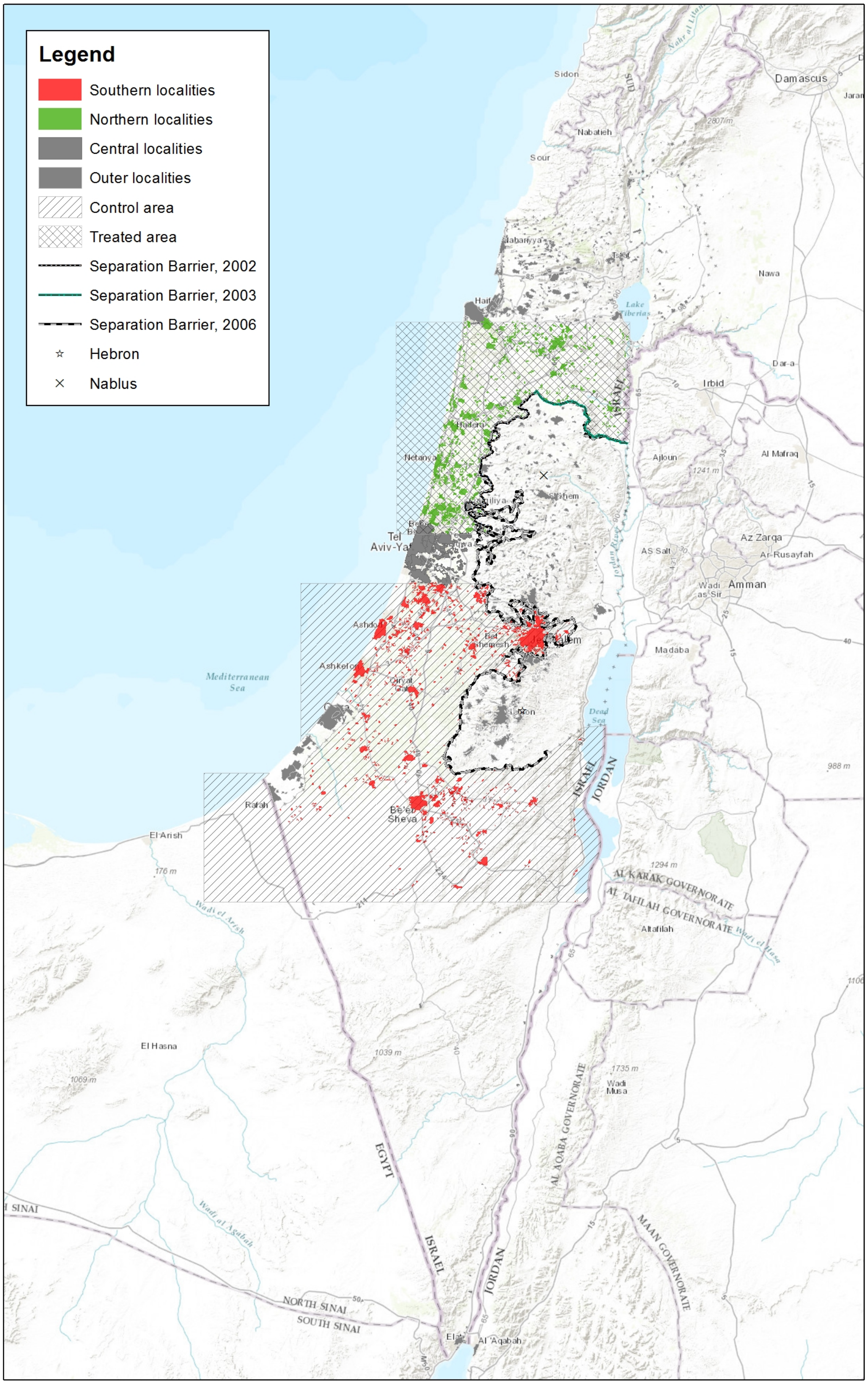


Figure 1: Map describes our study area and identification strategy.

Figure 1 above, depicts the different stages of barrier construction. The dark grey line (labeled 'Separation Barrier 2002') represents the first segment that was built starting from June 2002. The light line (labeled 'Separation Barrier 2003') depicts the extension approved in late 2002 and that was constructed in early 2003. These two lines are the basis for our treatment group. The grey line (labeled 'Separation Barrier 2006') depicts the south and central West Bank areas, in which the wall was completed only after 2005. We treat localities adjacent to this line as our control group. Israeli localities outside the two shaded regions are considered as "Outer group".

The barrier comprises a multilayered system of chain-link fences, electronic sensors that trigger signals to nearby command centers, electronic cameras equipped with night vision, trace paths, as well as several segments that are composed of concrete slabs (Hassner and Wittenberg, 2015, 179). It is augmented by a number of additional security features, including watch towers, trenches to prevent vehicles from crashing through the barrier, additional barbed wire, and patrol roads on both sides of the barrier (Dolphin, 2006). Sections of the wall that are close to Palestinian urban areas or to Israeli highways are constructed using 25-foot-tall and 10 feet wide concrete slabs designed to block sniper fire (see Figure 2a). Concrete segments constitute about six percent of the total barrier length, and the remaining barrier consists of chain-link fences and barbed wire with trace paths, trenches, and patrol roads (see Figure 2b). There are several passage gates placed along the barrier controlled by security forces (Dolphin, 2006).

(a) Concrete barrier

(b) Chain-link barrier

Figure 2: Separation barrier, pictures from OCHA (2014, 2)

Identification Strategy

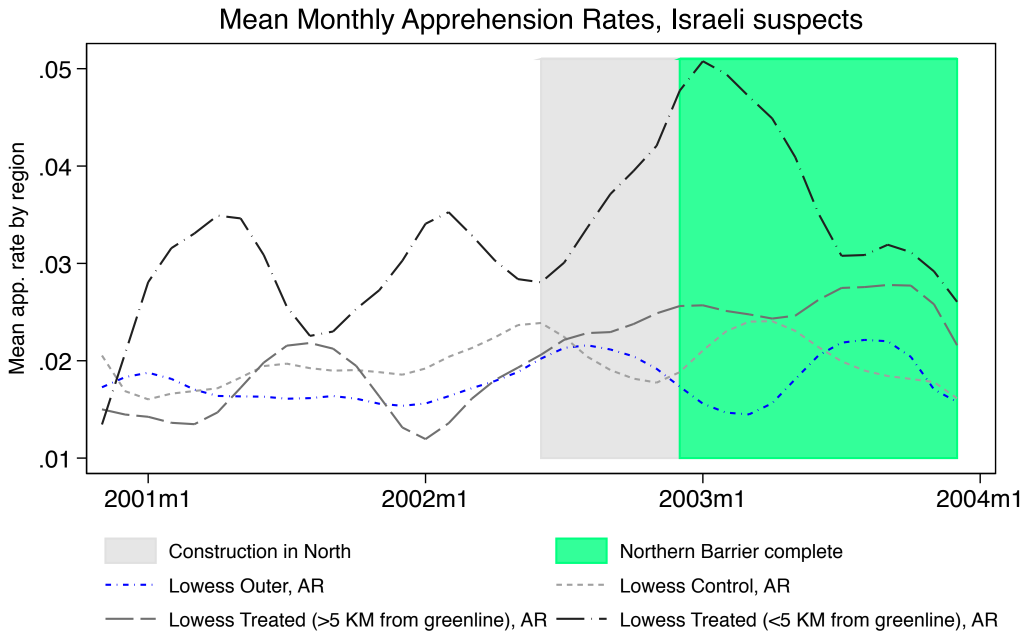
This study's identification strategy is based on the fact that the separation barrier route was drafted, and physical wall constructed, in a manner independent of criminal activity. Instead, the route was determined on the basis of the Green Line, with deviations intended to encompass as many Israeli settlements as possible, so as to enable their de facto annexation to Israel (Hareuveni, 2012).[8]

Moreover, one core assumption of our identification strategy is that the sequence in which the barrier was constructed—first in the northern West Bank and around Jerusalem, and only then in the south—was due to non-crime considerations; in this case, security concerns, and to lesser extent, litigation of route appeals. Between the outbreak of the Second Intifada in September 2000 and the approval of the barrier route in June 2002, 78 Palestinians attempted to commit suicide attacks against Israeli targets, and the majority of them originated in Palestinian towns in the north of West Bank and Jerusalem, where the first segments of the barrier were constructed (Benmelech, Berrebi and Klor, 2010).

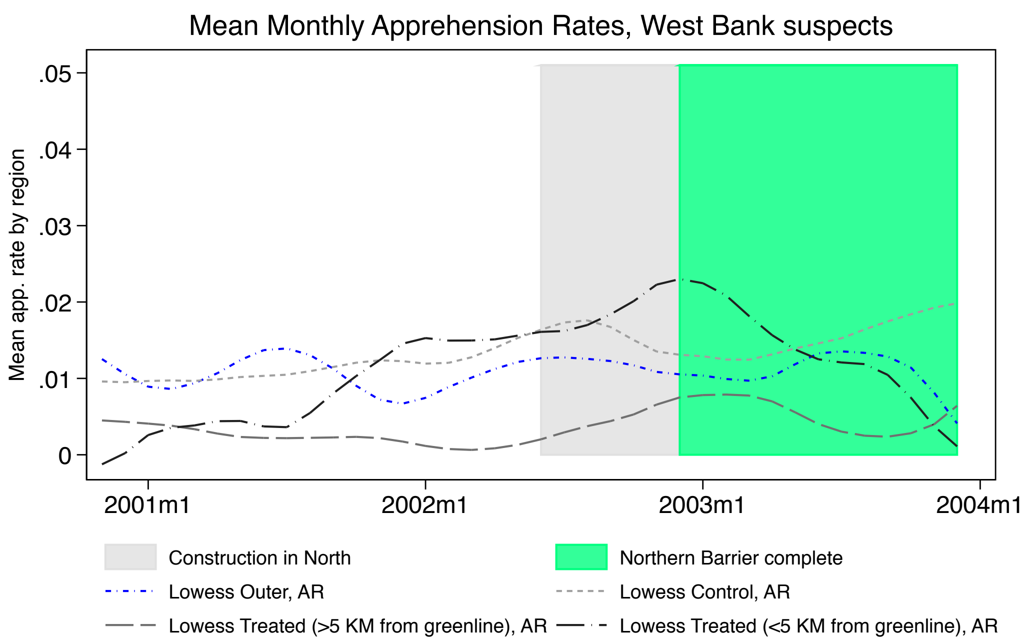
Another assumption of our identification strategy is that barrier construction did not coincide with unrelated changes in policy activity. We test this assumption by analyzing data we obtained from the Israeli police on suspects caught while operating stolen vehicles. This data includes information on when the suspect was brought into custody, as well as the precinct of the arresting unit. We match these arrests to an official map of police precincts and calculate monthly apprehension rates, which we break down by Northern, Southern, and Outer regions.[9] We also separate arrests in Northern localities according to proximity to the barrier (we use 5 kilometers as a "border" threshold). We plot these trends in Figure 3. Notice that only apprehension rates in Northern border localities, where supplemental forces were assigned as security details during construction, experience an increase during and immediately after erection of the barrier. Apprehension rates, an important outcome of police activity, appear unchanged in most Northern and across all Southern and Outer cities and townships.

[8] 85 percent of the barrier is running within the territory of the West Bank rather than on the Green Line, mainly in areas where Israel has established settlements and industrial zones. Close to 10 percent of the territory of the West Bank lies to the west of the barrier, on its "Israeli side" (Hareuveni, 2012).

[9] We discuss the auto theft data, used as the denominator of these apprehension rates, below.



(a) Apprehension rates of Israeli suspects.



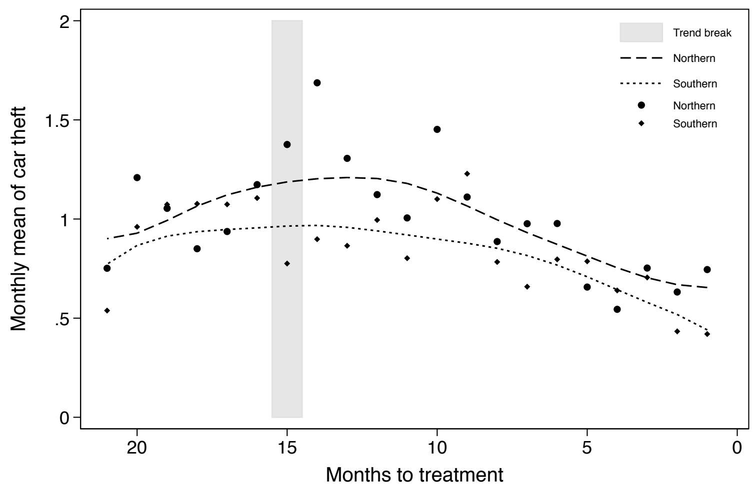
(b) Apprehension rates of West Bank suspects.

Figure 3: Apprehension rates for car theft suspects, by region of origin and capture.

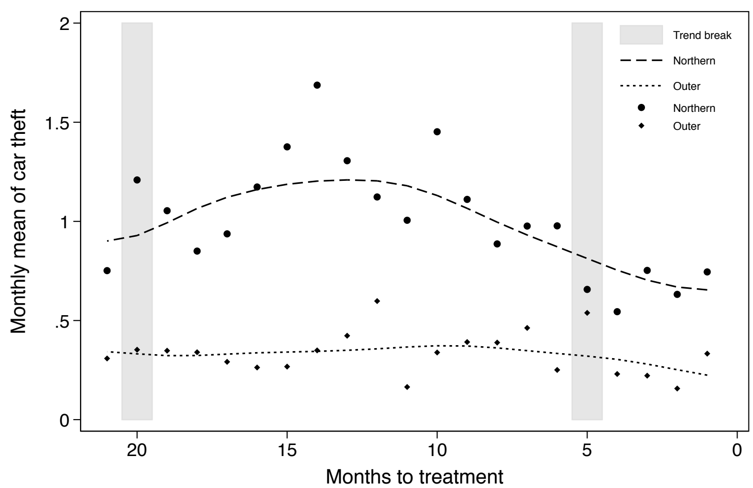
The final identifying assumption of our difference-in-differences approach is parallel trends prior to treatment. We visualize these trends in Figure 4. In each subfigure, we plot the monthly mean of car theft (per 1,000 residents) by subgroup for each month ahead of treatment. We plot each point, as well as a non-parametric lowess curve for each group. Because it is difficult to visually assess parallel trends, we add a bar indicating if the groups' month-over-month trends are statistically distinguishable from one another at the 10% level.[10] In Figure 4, top panel, there is one month with evidence of a trend break. In the bottom two panels, there is evidence of two trend breaks. Critically in the latter two cases, each break moves in opposite directions. Among all subgroup combinations, less than 10% of the pretreatment trends appear statistically non-parallel, giving us confidence in the main results.

We argue that the barrier constitutes a physical obstacle that makes the transportation of stolen vehicles to the northern part of the West Bank exceedingly riskier, thus raising the expected cost of crime participation. First, the barrier increases the average length of travel between Israel and the West Bank, thereby increasing the risk of apprehension. Based on our conversations with sources in the Israeli Police, once a stolen vehicle crosses into the West Bank, it is almost impossible to track it down. Thus, increasing the length of the route that the vehicle travels in Israel directly increases apprehension probability. Second, following the barrier construction all stolen vehicles that are being transported from Israel to the West Bank must go through the main roads and pass well-guarded checkpoints on their way out of Israel. Thus, the construction of the barrier disrupted many of the previous routes (often unpaved roads) taken by the smugglers, and increased the risk of apprehension.

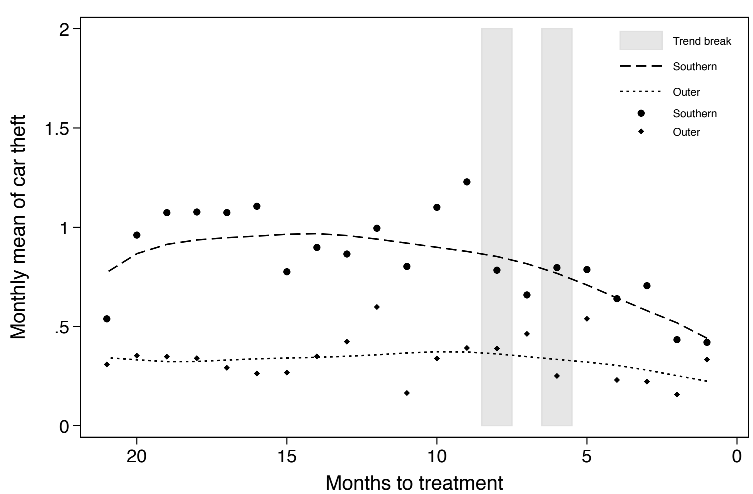
[10] To calculate these breaks, we perform a simple differencing diagnostic evaluating whether the change in car theft from one month to the next is significantly different in one subpopulation versus another. We repeat this test for all subpopulations we compare.



(a) North vs. South



(b) North vs. Outer



(c) South vs. Outer

Figure 4: Empirical evaluation of parallel trends assumption across pretreatment periods.

Data and Estimation Strategy

We combine geographically-disaggregated data from various sources to estimate the effect of Israel's separation barrier on auto theft in both newly protected areas (Northern localities), and areas that remain unprotected (Southern localities). In this section, we briefly describe the data sources and measurement of the study's main variables. A more detailed description of the data can be found in the online appendix.

Our unit of analysis is the locality-month, and our empirical tests focus on the period between September 2000 and January 2004. We focus explicitly on Jewish Israeli localities within the Green line, thereby excluding Israeli settlements in the West Bank and Arab or mixed localities (we include mixed localities in robustness checks). Localities could be municipalities, local councils, and regional councils. We disaggregate the latter into their smaller components (villages, agricultural communities, etc.). The number of localities in a given year ranges from 914 to 1,050 (the changes reflect establishment of new localities, as well as merging or dismantlement of existing ones).

The study's key dependent variable is the number of reported vehicle thefts per 1,000 residents in a given locality-month. We obtained these data from the Israeli Police using the Israeli Freedom of Information Law. The police also provided us with data on suspects arrested for operating stolen vehicles, including the date and the location of arrest as well as the town of residence of apprehended individuals.

We employ a spatial overlap analysis to assign localities to either treatment (Northern), control (Southern), or "Outer" groups. Geographic Information System (GIS) software was used to define the location of the 2002, 2003 and 2006 barriers (see Figure 1) and delineate areas that define treatment status. The treatment boundary was drawn to extend from the 2002 and 2003 separation barriers to the western coastline (approximately 25 kilometers) and an equivalent distance to the north of the barrier. The resulting boundary rectangle was cut to exclude areas to the south and the east of the barrier. A spatial selection was used to identify those localities that were within this boundary. This process was repeated in delineating the boundary that defines our control group adjacent to the Southern part of the West Bank, with two small differences. First, the boundary of the control group extended approximately 40 kilometers from the 2006 line to the western coastline and an equivalent distance to the south, reflecting the greater distance to the coastline. Second, we exclude Gaza from the control area. As with localities in the North, a spatial selection was used to identify Southern localities within the boundary of the control. All localities that are located outside of the treatment and control regions were assigned to the "Outer" group.

The main independent variable *Treatment* is a binary measure that takes the value of one for all localities in the treated Northern region and the value of zero for localities in the unprotected Southern area. This specification allows us to test the partial equilibrium common in the literature. In our general equilibrium specifications, we replace this treatment variable with two binary variables; in one specification, we compare the Northern localities to the Outer localities, and in another specification we compare the Southern localities to the Outer localities. This empirical design most closely follows Donohue, Ho and Leahy (2015). In addition to protection status, we also generate the variable *Post*, a binary identifier of the treatment period that is equal one in all months after August 2002, when the lion's share of the barrier along the Northern border was in place.

In addition to our main independent variable, we control for a variety of locality-level attributes that can affect auto theft. In particular, we control for a continuous measure of population size, a binary measure of urbanization, a continuous measure of distance from the Green Line (and its squared term), municipal administrative designation, and flexible time trend. These measures are taken from the Israeli Central Bureau of Statistics. Further description of these data is in SI. In robustness checks, we also control for locality's socio-economic status and exposure to terrorism.

Summary statistics of our variables are in Table 1. The data show that in the Northern localities the mean number of monthly vehicles stolen per 1,000 residents has dropped from 1.01 in the pre-construction period to 0.56 in the post-construction period, whereas in the Southern localities it has increased from 0.85 to 1.1 (see Table 1). Consistent with findings from past studies that focus on localized effects, this strongly suggests that organized gangs have adjusted their criminal behavior in response to changes in smuggling costs associated with the barrier construction. Importantly, the unchanged mean monthly vehicles stolen per 1,000 residents in the outer townships before (0.33) and after (0.3) the barrier construction, is consistent with our assumption that those localities are unaffected by the barrier's externalities on the cost of crime.

Estimation Strategy

We use a series of difference-in-difference regressions to estimate the effect of barrier construction on auto theft. Our base model is captured by equation 1:

$$Y_{jt} = \alpha + \beta_1 T_j + \beta_2 Post_t + \beta_3 T_j \times Post_t + \eta_t + \gamma X_{jt} + \epsilon_{jt} \quad (1)$$

where Y_{jt} is the number of vehicles stolen per 1,000 residents in locality j in month t; $T\dot{j}$ is

Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Northern localities (Treatment)					
Auto thefts pre-barrier (per 1k residents)	1.01	1.67	0	14.94	11232
Auto thefts post-barrier (per 1k residents)	0.56	0.9	0	11.19	11232
Population (10k)	0.29	1.22	0.01	14.34	11232
Part of a regional council	0.89	0.31	0	1	11232
Urban locality	0.12	0.33	0	1	11232
Distance to the West Bank (km)	11.66	7.89	0.21	33.94	11232
Socio-economic level	6.19	1.18	2	10	11205
Number of suicide attacks in locality	0	0.05	0	1	11232
Number of suicide attacks in district	0.35	0.63	0	4	11232
Number of all attacks in locality	0.01	0.11	0	3	11232
Number of all attacks in district	1.83	1.99	0	12	11232
Southern localities (Control)					
Auto thefts pre-barrier (per 1k residents)	0.85	0.94	0	7.13	12519
Auto thefts post-barrier (per 1k residents)	1.1	1.1	0	8.74	12519
Population (10k)	0.27	1.33	0	14.94	12519
Part of a regional council	0.92	0.28	0	1	12519
Urban locality	0.09	0.28	0	1	12519
Distance to the West Bank (km)	16.36	11.08	0.11	48.15	12519
Socio-economic level	5.68	1.34	2	10	12480
Number of suicide attacks in locality	0	0.01	0	1	12519
Number of suicide attacks in district	0.22	0.62	0	5	12519
Number of all attacks in locality	0.01	0.15	0	8	12519
Number of all attacks in district	3.51	3.71	0	25	12519
Outer localities					
Auto thefts pre-barrier (per 1k residents)	0.33	0.67	0	8.02	11427
Auto thefts post-barrier (per 1k residents)	0.3	0.49	0	4.27	11427
Population (10k)	0.51	2.15	0	16.32	11427
Part of a regional council	0.87	0.33	0	1	11427
Urban locality	0.12	0.32	0	1	11427
Distance to the West Bank (km)	49.16	32.04	2.44	198.19	11310
Socio-economic level	5.60	1.27	2	10	11388
Number of suicide attacks in locality	0	0.03	0	2	11427
Number of suicide attacks in district	0.23	0.49	0	4	11427
Number of all attacks in locality	0	0.07	0	4	11427
Number of all attacks in district	1.74	2.08	0	12	11427

Note: These summary statistics refer to the sample of localities we use in our main estimation: Jewish-Israeli localities between October 2000 and January 2004, where the unit of analysis is the locality-month.

a treatment indicator; $Post\_t$ is the indicator for the post-construction period (August 2002); η_t denotes a linear month trend, which accounts for secular growth in the demand for stolen cars; X_{jt} is a vector of locality controls; and ϵ_{jt} is the locality error term. In all models we cluster standard errors at the locality level. We also introduce estimates that leverage unit and time fixed effects. In the main analysis, the coefficient of interest is β_3.

Main Results

In this section we focus on two sets of results. First, we examine the partial equilibria; namely, whether the construction of the separation barrier reduced the intensity of auto theft in newly secured Northern localities, as compared to not-yet-protected Southern localities. We find that the difference-in-difference coefficient (Treatment × Post) is large, negative, and significant. There is consistent evidence of this result across comparisons of treatment, control, and outer areas, and in difference-in-difference and fixed effects specifications. See Table 2, columns 1 and 4, for the difference-in-difference and fixed effects (locality and month) results, and Table SI-2 for robustness checks with outcome lags.

Second, we use comparisons with the "Outer" localities to decompose the difference-in-difference coefficient to identify how much of the total treatment effect is due to reductions in auto theft in the protected localities of the North and how much stems from displacement of theft to unsecured localities in the South. We explore these dynamics below.

Table 2: Barrier Construction and Auto Theft: Deterrence or Displacement

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.334***	0.196***	-0.136***			
	(0.041)	(0.035)	(0.030)			
Post	0.341***	0.163***	-0.111**	0.834***	0.909***	0.165
	(0.058)	(0.044)	(0.047)	(0.152)	(0.206)	(0.118)
Treatment × Post	-0.708***	-0.415***	0.292***	-0.709***	-0.412***	0.293***
	(0.081)	(0.072)	(0.057)	(0.081)	(0.071)	(0.057)
Constant	1.900	4.904***	-1.743*	0.743***	0.244	0.390***
	(1.227)	(0.959)	(1.034)	(0.160)	(0.159)	(0.135)
N	24901	23630	24969	24901	23630	24969
Clusters	608	577	609	608	577	609

Note: The three left column use "regular" Diff-in-Diff regressions, while the three right columns report instead results from equivalent fixed effect models (locality and date). North Vs. South columns compare treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the southern border with the West Bank); North Vs. Outer columns compare instead treatment localities to unprotected areas that are outside the control polygon; and South Vs. Outer columns examine two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.
- Robust standard errors in parentheses, clustered by locality.
* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Deterrence and Displacement

A core question in the situational prevention literature is whether interventions reduce overall crime, or merely displace it elsewhere (Mayhew et al., 1976). Unfortunately, the literature has yet to develop compelling models of when we might expect interventions to displace crime rather than lower crime (Guerette and Bowers, 2009). There are, however, good reasons to suspect that this is mostly a function of the distribution of underlying (i.e. non-enforcement) *operating costs of crime*. If some locations are inherently cheaper for criminals (e.g., dark alleys) and if there are non-negligible transaction costs associated with moving activities elsewhere, then situational prevention measures likely lower crime overall. If the operating costs of crime are similar across locations, and transaction costs are minimal, we should expect instead to observe displacement. In short, prevention and displacement depend on the nature of the crime and the institutional context.

In Table 2, we have shown that auto theft significantly declined in Northern localities after the security barrier was constructed compared to Southern localities. This result, however, potentially incorporates two effects: deterrence and displacement. If construction of the barrier causes significant externalities to Southern localities, the baseline models—as all empirical strategies that identify partial (local) equilibria—may overstate the true treatment effect. To address this concern, we compare criminal activity in the Northern and Southern localities to "Outer" units, i.e., towns outside of these regions where the potential for crime spillovers should be limited. Results reported in Table 2, North vs. Outer and South vs. Outer columns, suggest that a substantial amount (but not all) of the reduction in auto theft in the protected Northern localities was displaced to Southern towns. In the post-treatment period, auto thefts dropped in Northern localities by 0.4 stolen vehicles per 1,000 residents compared to Outer areas, whereas the South experienced only 0.3 additional stolen vehicles per 1,000 residents relative to Outer localities. These shifts in car theft are equivalent to a 41% decrease in car theft among Northern localities and a 34% increase across Southern localities. Comparing the pre-construction monthly car theft grand mean (0.73 per 1,000 residents) to the post-construction mean (0.67 per 1,000 residents) further underscores our contention that most (but not all) of the reduction in auto theft in the North was displaced to the South.

Finally, the wall can affect crime not only by deterring auto theft in the North, but also by making it harder for criminals from the West Bank to enter Israel and steal vehicles in localities protected by the barrier (i.e. incapacitation effect rather than deterrence due to higher opportunity cost of crime (Chalfin and McCrary, N.d., pp.10-11)). While we acknowledge that the barrier has made it harder for Palestinians to cross the border, we argue that incapacitation alone cannot account for our findings. Using data on all auto-theft-related arrests in Israel and the West Bank, we show in Table SI-1 that the vast majority of car-theft suspects arrested in the North area are from Israel and not from the West Bank, and that the share of West Bank arrestees increases slightly after the introduction of the barrier, but they still constitute a small fraction of all the arrestees.[11] Although these figures are based on arrest data and not on all the universe of crime data, the low percentage of West Bank suspects suggests that incapacitation is not the main mechanism that explains how the barrier affects car theft. Furthermore, as we demonstrate in Figure 3a and Figure 3b, the largest increases in car theft apprehension occur among Israeli suspects in Northern border regions, while detention of suspects originating in the West Bank sees only a marginal increase.

Robustness

We run several checks to test the robustness of our findings. In this section we describe briefly the checks, relegating the regression tables to the online appendix. First, we adjust our analysis for potential spatial dependence. In particular, one might be concerned that the criminal organizations operating in various parts of the treated and control regions may adjust their tactics across a number of localities, such that the cross-section of localities cannot be considered independent observations. We address this concern by first identifying all Arab Israeli towns that are known to be central to auto theft organized activity, and then clustering localities that are closest to each these towns using Thiessen polygons. Aided by these clusters, we adjust our standard errors accordingly and report results in Supporting Information, Table SI-4. Second, we exclude potential outliers from the main analysis. In Table SI-5 we report results when dropping Be'er Sheva—a hotspot for auto theft—from the sample and in Table SI-6 we exclude the densely populated localities—known as "Gush Dan"—that lie between the Northern and Southern localities. Also, in Table SI-7, we expand our sample to include localities with mixed populations. As these results clarify, our findings are robust to these modifications.

Previous research provides compelling evidence that suicide bombings and other forms of terrorism can affect the allocation of police units to affected areas, which in turn affects crime (Gould and Stecklov, 2009). The separation wall was built to address these security concerns, but insurgent activity continued during and after construction. The wall thwarted some, but not all, attempts to carry out acts of terrorism. To address potential covariance concerns in barrier construction and terrorism, we gather georeferenced data on suicide and conven-

[11] According to arrests data, West Bank suspects arrested in the North constitute only 13% of those arrested for car-theft related charges in the pre-barrier period, and 16% in the post-barrier period. The distribution of suspects' origin is similar for suspects arrested in the South and the Outer areas. We obtained these data from the Israeli police using the Freedom of Information law.

tional attacks. We aggregate the number of terrorist events by locality- and district-month. There are reasons to believe that reshuffling of police and military units might correspond to some but not all forms of terrorism. We remain agnostic and account for measures of each type of violence. These results are presented in tables SI-8 through SI-11. Importantly, our findings are robust to all four measures of local terrorist activity. In SI-12 we also show that our results hold when controlling for localities' socio-economic status.

Smuggling Route Disruption

In this section we provide further evidence of the (rational) response of northern gangs to increased risk of apprehension due to the barrier construction by taking advantage of plausibly exogenous variation in route disruption across northern localities. Recall that the construction of the separation barrier introduced operational constraints on gangs in the northern part of the West Bank. Core criminal behavior models suggest that if the perceived risk of apprehension in locality j increases due to some visible (situational) prevention measure, criminal activity in that locality should be reduced, or displaced (Chalfin and McCrary, N.d.). In our context, the construction of the separation barrier increased the risk of apprehension in the protected North due to two factors: (1) a shock common to all localities; and (2) a locality-specific shock to smuggling routes.

The separation barrier introduces a common shock by forcing all thieves operating in the North to drive on main roads and through checkpoints when transporting stolen vehicles into the West Bank, irrespective of the Northern locality in which vehicles were stolen. Because the extent to which the construction of the separation barrier disrupted routes previously taken by smugglers changes from one locality to another, changes in the risk of apprehension are also a function of locality-specific shocks. Thus, if criminal gangs are responding rationally to exogenous increases in risk—as seminal models of criminal behavior assume but have a hard time testing—then the observed reductions in auto theft in Israel's Northern localities should also be increasing in the locality-specific costs of smuggling stolen vehicles. In this section we use our granular road network data to test this proposition. More so, given the nature of our analysis, we are able to further decompose the total auto theft reduction in the North and differentiate the share that is due to the common shock and the share that is due to idiosyncratic, locality-specific disruption of preferred smuggling routes.

To identify the degree to which trafficking routes were disrupted in newly secured Northern localities, we gather data on the road network connecting Israel and the West Bank from **Open Street Map** repositories. Based on secondary information and interviews with police officers and criminologists in Israel we also identify the locations where vehicles were most frequently taken to be dismantled. In the North, a substantial amount of auto theft activity is based out of the city of Nablus; in the South this activity is largely based around Hebron. With these data in hand we build on a route optimization problem detailed by Dell (2015) and calculate optimal paths from each locality to the nearest stolen vehicle destination.

We begin with a directed graph of all paved vehicular roads in Israel and the West Bank R, which is composed of intersections N and roadways E (so, $R = (N, E)$). Smugglers attempt to move stolen vehicles from Israeli localities to Palestinian chop shops, where vehicles are dismantled. Each smuggler attempts to minimize the risk of apprehension and input costs of transit. For simplicity, let each roadway $e \in E$ have a cost function determined by the length (l_e) of the road, so the risk and cost of traveling along a given road is equal to $c_e(l_e)$. If traversing $n \in N$ is costless, then the total cost of a potential smuggling route p is $V(p)$ $= \sum_{e \in p} c_e(l_e)$. This term covers both the opportunity cost of crime, as well as the risk of apprehension.[12]

Let $P_{L,CS}$ denote the set of all possible routes between localities L and "chop shops" CS in the pre-construction period. Criminals optimize routes such that:

$$\min_{p \in P_{L,CS}} V(p). \tag{2}$$

After the construction of the separation barrier, some (but not all) of these paths are disrupted. To calculate route disruptions, we constrain traffic in the post-construction period to cross from Israel proper to the West Bank using main roads and thus to necessarily pass through security checkpoints. That is, edges E in R that bisect the separation barrier $\mathbf{B}$ are eliminated from the set of roadways that could be utilized to pass from Israel to the West Bank. By implication, unpaved or semi-paved roads are dropped from the network after barrier construction. Denote the remaining traversable pathways and intersections as E' and N'.

Following the construction of the separation barrier, for every path p', the cost of travel is $V(p') = \sum_{e' \in p'} c_{e'}(l_{e'})$, where e' can only be drawn from E'. For some localities, potential smugglers employ the same route in the presence of the security barrier. To clarify, for these towns, the p in $P_{L,CS}$ and p' in $P'_{L,CS}$ that minimize transit costs are identical ($p = p'$). For other localities, introduction of the checkpoints constraint increases the cost of travel substantially. For these localities, $p < p'$. See Figure 5 for a visualization of the optimal smuggling routes, before and after barrier construction.

[12] The degree to which a route is disrupted—and lengthened—impacts both the risk of apprehension while transporting the vehicle (length of road driven in stolen vehicle) and opportunity costs of the criminal transaction (amount of time spent driving the vehicle).

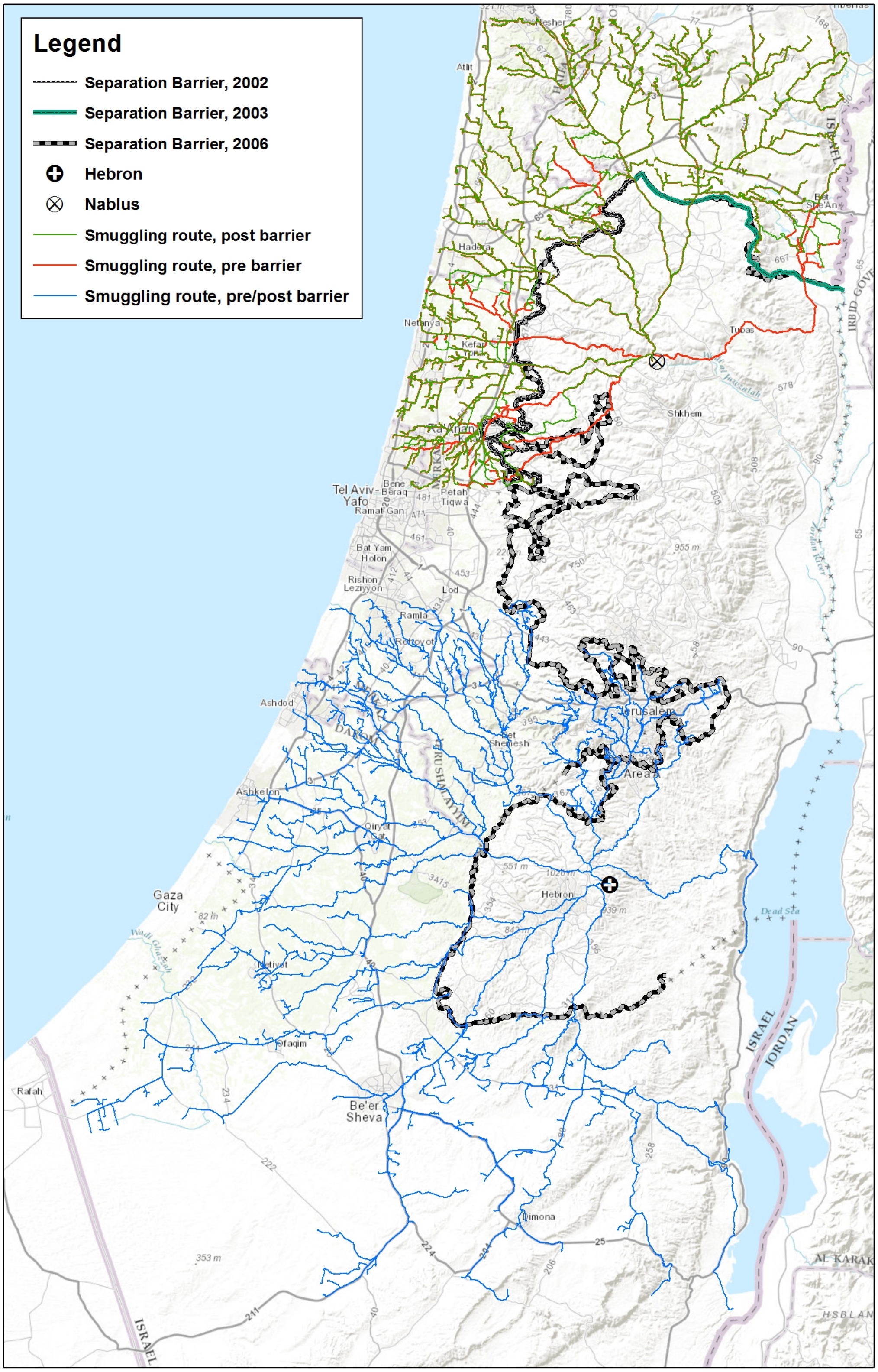


Figure 5: Network of shortest path smuggling routes, with disrupted paths (red)

For all treated localities, $\frac{p'}{p} \geq 1$. Under a binary treatment condition, route disruption is considered uniform. Yet disruption differentially raises the costs of auto theft when $\frac{p'}{p} > 1$. To test if route disruption implies heterogeneous treatment, we calculate d, treatment intensity, simply as $\frac{p'}{p}$ after the construction of the barrier and 0 otherwise. Practically, d exceeds the binary treatment condition by the percentage of the pretreatment route length disruption. We note that just over a third of Northern localities have a value of $d > 1$. We first plot the raw data to gauge the relationship between distance to the main chop-shop and monthly auto theft (normalized by population), and how this relationship is affected by the introduction of route disruption.

In the left panel of Figure 6 the monthly mean of auto theft is plotted before and after the construction of the barrier as a function of localities' route length to Nablus. Focusing on the pre-construction period (dashed red line), we find an interesting non-linearity between path length to Nablus and car theft intensity: areas that are close to the West Bank and areas that are farther away witness fewer auto thefts per capita than localities in the path length mid-range. Reassuringly, we find a similar pattern in the Southern localities in the pre-construction phase (Figure 7, left panel, red-dashed line). This is likely because localities close to the West Bank (in both the North and South) are more likely to be gated, and to have adopted private security measures to thwart auto theft. This suggests that distance to chop-shops is not the only consideration factoring into gangs' cost function in the pre-construction period. While in both the North and South path length (i.e., distance) dominates the choice of auto thieves for all towns that are located about 45km from the main Palestinian chop-shop, it is only a secondary consideration for closer localities.

Results

We now examine how idiosyncratic route disruption affected population normalized auto theft rates in the post-construction period. In the right side panel of Figure 6, we plot the differences in monthly car theft as a function of both p and d. We find that auto theft reduction follows d very closely. Where the cost of criminal activity, d, is monotonically *increasing*—from the "border" till approximately 42 kilometers from Nablus—the *decrease* in auto theft is also growing larger. As the rate of disruption begins *decreasing*—for localities that are located more than 42 kilometers from Nablus—the reduction in criminal activity is still substantial, but smaller in magnitude. In short, the localities that observed the greatest drop in auto theft activity are exactly those that benefitted from the largest (unintended) increases in the costs of smuggling through disruption of trafficking routes following the construction of the separation barrier. This is exactly what we should find if the barrier affected d, the "distance" parameter, but not non-distance factors (e.g., localities choice of hiring private security firms), and if criminal gangs respond to heightened risks and costs of smuggling in a rational way.

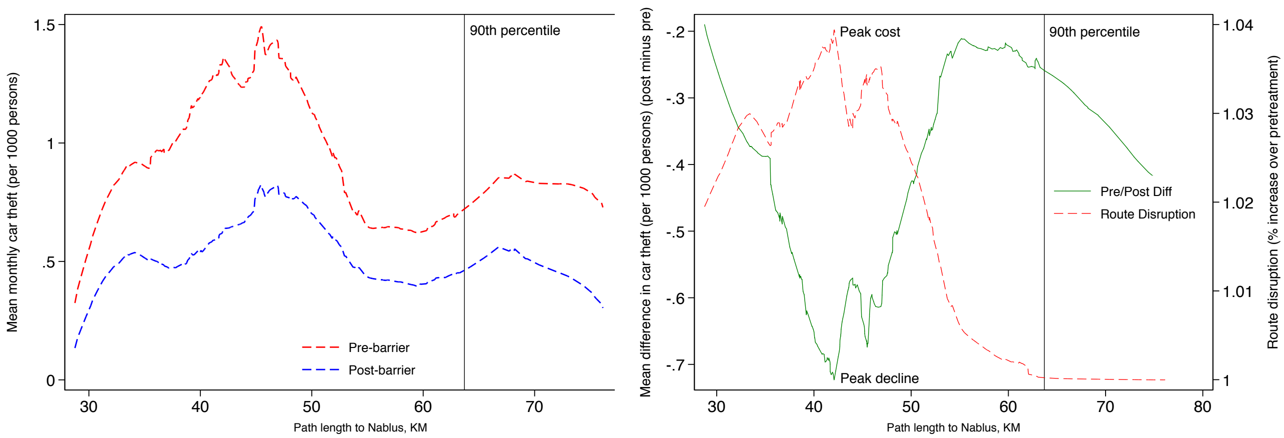


Figure 6: Impact of smuggling path disruption on predicted auto theft intensity

Moving from the raw data to a regression framework, in Table 3 we introduce various ways to model the heterogeneous effects of barrier construction on auto theft reduction. This analysis allows us to not only model the extent to which route disruption mediates the relationship between the barrier and auto theft, but also to decompose the total treatment effect to a part that is due to the common shock and a part that is due to idiosyncratic shocks (i.e., route disruptions).

In the first set of models, we combine the common shock (the construction of the barrier) with disruption of smuggling routes. Here, the interaction takes the value 1 for Northern localities after the barrier is built if the preferred smuggling route does not change (i.e., the route happens to go through a checkpoint). If the route does change, we measure the degree of disruption as a percentage. The maximum disruption we calculate is 54% (the route, after the barrier, increases by 54%), so the maximum observed value of the treatment classification is 1.54. Comparing Northern localities to Southern and Outer townships, we find evidence of heterogeneous treatment. Importantly, these differential effects obtain when accounting for the degree of disruption as a percentage or in absolute terms stated as kilometers. These effects are substantial, with each percentage increase in route length after barrier construction causing a .02% reduction in auto theft, and each additional kilometer of the smuggling route decreasing auto theft by roughly 6%.

We complete our study of Northern localities by modeling the common shock and common shock with disruption simultaneously. We find strong evidence that the barrier alone served to deter auto theft. Even if the preferred route did not change after the barrier was constructed, auto theft still declined significantly as thieves needed to transport the vehicles through newly fortified checkpoints. For these localities, auto theft declined by roughly 0.32 vehicles per 1,000 residents (or 32% relative to the pre-construction auto theft levels). If, however, the barrier forced smugglers to reroute, the reduction in auto theft was further enhanced. At the maximum disruption level (54% increase in route length), disruption resulted in an additional drop of 0.51 auto thefts per 1,000 residents. In total, this shift represents an 83% decline in car theft relative the pretreatment period.

Table 3: Impact of Smuggling Route Disruption on Auto Theft: Common Shock and Heterogenous Treatment Intensity

Panel A: Diff-in-Diff

	North Vs. South	North Vs. Outer			
	Common shock + disruption	Common shock + disruption	Degree of Disruption (%)	Degree of Disruption (KM)	Common shock vs. Common shock + disruption
Treatment	0.304***	0.178***	1.191***	0.027***	0.187***
	(0.046)	(0.041)	(0.430)	(0.010)	(0.045)
Post	0.341***	0.164***	-0.012	-0.013	0.161***
	(0.058)	(0.044)	(0.043)	(0.042)	(0.044)
Treatment × Post	-0.693***	-0.408***	-2.488***	-0.057***	-0.320***
	(0.080)	(0.071)	(0.887)	(0.021)	(0.066)
Treatment w/ disruption					0.289***
					(0.074)
Treatment with disruption × Post					-0.544***
					(0.141)
Constant	1.926	4.921***	5.015***	5.016***	4.877***
	(1.224)	(0.959)	(0.960)	(0.960)	(0.959)

Panel B: Diff-in-Diff with Fixed Effects

	North Vs. South	North Vs. Outer			
	Common shock + disruption	Common shock + disruption	Degree of Disruption (%)	Degree of Disruption (KM)	Common shock vs. Common shock + disruption
Treatment					
Post	0.889***	0.910***	0.746***	0.746***	0.897***
	(0.163)	(0.206)	(0.192)	(0.192)	(0.203)
Treatment × Post	-0.694***	-0.405***	-2.472***	-0.057***	-0.319***
	(0.080)	(0.070)	(0.872)	(0.021)	(0.066)
Treatment with disruption					
Treatment with disruption × Post					-0.537***
					(0.139)
Constant	0.744***	0.245	0.148	0.148	0.245
	(0.161)	(0.158)	(0.162)	(0.162)	(0.158)
N	24901	23630	23630	23630	23630
Clusters	608	577	577	577	577

Note: Model 1-2 allows the binary treatment status to exceed 1 in cases where routes are disrupted. The maximum observed increase in route length is 54%, so the maximum value of this measure is 1.54. Model 1 compares Northern and Southern localities; model 2-5 compares Northern and Outer localities. Model 3 measures disruption as a percentage of pretreatment route length, while Model 4 measures the absolute increase in route length in kilometers. Model 5 differentiates localities that received only the common shock from those that received the common shock and experienced route disruption. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01

Extensions

We have thus far provided robust evidence that a visible measure that increased the risk of apprehension of thieves—the construction of a separation barrier between Israel and the West Bank—decreased auto theft in the Northern localities (and more so where route disruption was higher) at the same time that it increased auto theft in the Southern localities not protected by the barrier. In this section we seek to deepen our understanding of the economics of crime by extending our analysis in two important ways. First, we discuss the logic of theft increase in the unprotected South and provide suggestive evidence that risk of apprehension (proxied as distance to chop-shop), is one among several other considerations of gangs' site selection. Second, we examine the endogenous reaction of northern gangs to the drop in car smuggling due to the barrier construction. Specifically we examine two possible mitigation strategies—relocation of activities to the South and substitution to other criminal activities— and provide suggestive evidence that is consistent with the latter strategy, but not the former.

Auto theft displacement in the unprotected South

Above we have shown that most (but not all) of the reduction in auto theft in the North has been displaced to the South. In this section we examine the logic of such spatial displacement. Specifically, we examine "where crime goes" when it gets displaced and why.

We argue that crime displacement and reduction follow a similar logic—criminals still respond to smuggling costs, but expanding predation imposes two additional constraints: 'carrying capacity' and rival operations. First, localities relatively close to Hebron likely have reached their carrying capacity of theft in the pre-treatment period and could not sustainably bear additional theft.[13] In the absence of a substantial increase in the number of vehicles in these locations or a change in private security provision that coincides with barrier construction, criminals should opt to predate relatively more among localities further away from Hebron. Second, if criminals are concerned about inter-network conflict over zones of activity, they may be willing to absorb an increase in transit costs and associated risks of apprehension to avoid intense contact with rival gangs.

We find strong support for this logic when examining displacement trends in the South following construction of the Northern section of the barrier. In the left side of Figure 7 we plot the mean monthly number of stolen vehicles before and after the construction of the

[13]Carrying capacity is a function of localities' (finite) supply of vehicles that are in demand in the 'black' market for spare parts, and of private and public security measures that are endogenous responses to localities' level of predation.

barrier as a function of localities' route length to Hebron, and in the right-side we plot the pre/post differences in mean monthly number of stolen vehicles. We find that the largest increases in criminal activity in localities unprotected by the barrier did not occur near the border. Quite the contrary, auto theft in the South *increases* almost linearly until about 65 kilometers from Hebron, before dropping down.

Only among townships far from the West Bank—localities that suffered from limited auto theft in the pre-construction period—is auto theft decreasing in distance to the center of stolen vehicle dismantling operations. In other words, only where we neither expect inter-gang competition nor anticipate carrying capacity has been reached, do smuggling costs (i.e., distance) dominate gang's choice of theft location. By contrast, where carrying capacity is high and inter-gang competition is a genuine concern, route length is only a secondary consideration for gang's target selection.

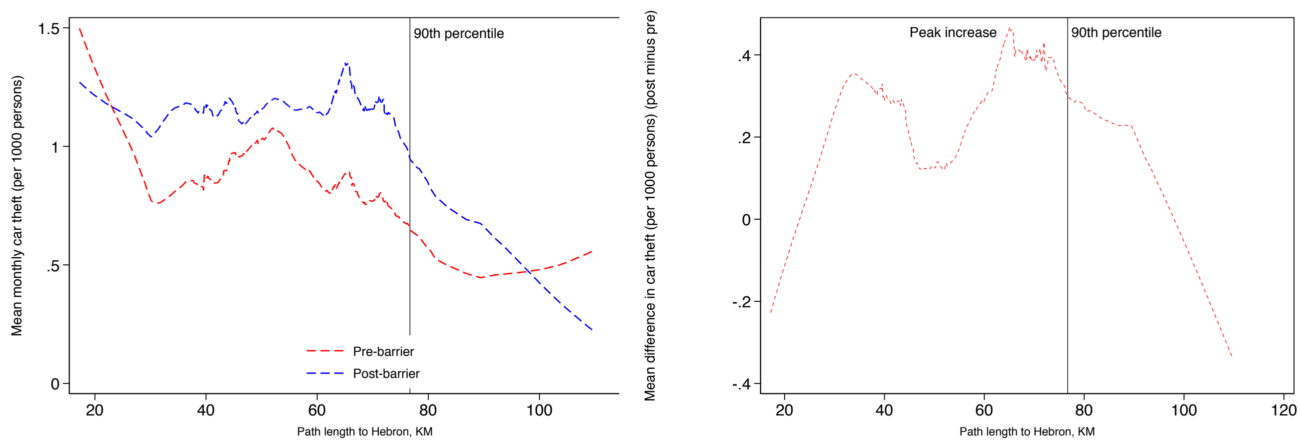


Figure 7: Impact of smuggling path disruption on predicted mean change in auto theft intensity

Northern Gangs: Mitigating Strategies

We have demonstrated that Northern gangs were forced to reduce the smuggling of stolen vehicles into the West Bank following the construction of the separation barrier. In this subsection we explore those gangs' mitigating strategies. First we explore whether Northern gangs relocated activities to the yet-to-be protected South. Second, we explore whether Northern gangs substituted to (i.e., increased production of) other criminal activities.

Relocating to the South

One observable implication of the idea, introduced above, that intergroup competition shapes displacement patterns of auto theft is that gangs from the North will have a hard time relocating to the South.[14] Though we naturally do not have information on the identity of (uncaught) thieves, we can proxy this by examining arrest data. Indeed, we find that the rate of apprehension among thieves that reside in the North but were caught in the South remained unchanged following the barrier construction. We visualize this data in Figure 8. This strongly suggests that the increase in auto theft in the South is almost exclusively due to Southern gangs increasing "production" to meet unchanged underlying demand, rather than Northern gangs relocating their criminal activities further south.

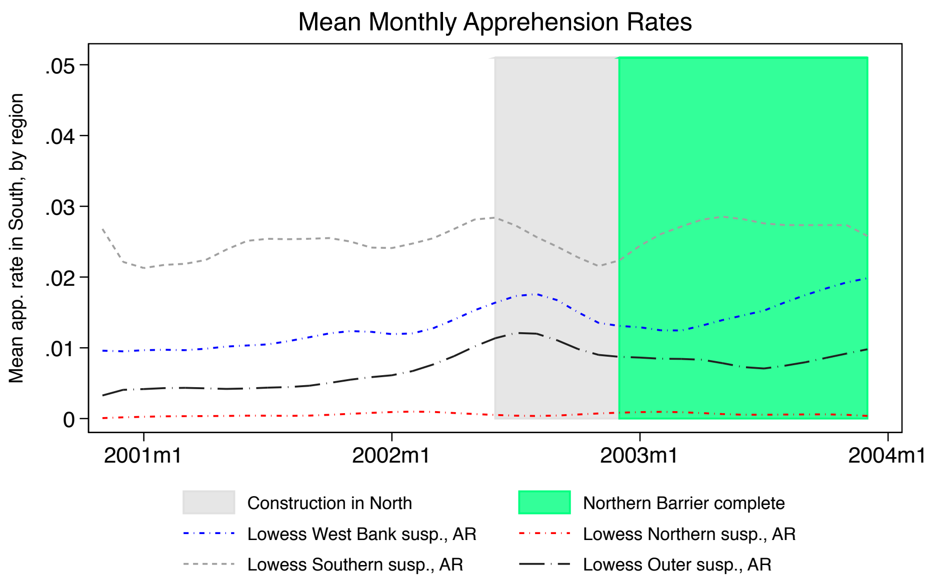


Figure 8: Trend in apprehension rates of suspects in Southern localities, by suspect's origin

[14]Transaction costs might be another reason why Northern gangs have a hard time relocating immediately to the South following the construction of the separation barrier.

Substituting to other forms of crime

We turn to (an admittedly) tentative examination of whether the separation barrier induced Northern gangs to compensate the loss of revenue due to reduction in stolen vehicle smuggling by increasing other criminal activities. Specifically, we focus on the effect of the construction of the separation barrier on house break-ins. First, house break-ins is a well-reported crime due to insurance trigger consideration. Second, our analysis can take advantage of the fact that two crimes commonly coincide with one another as crimes of opportunity. Thieves break into homes to steal car keys or take them during the course of a deliberate robbery. Thus if criminals do not substitute one form of crime for another, we would expect to observe that a drop in car theft in the North leads to a drop in house robberies in Northern localities. By contrast, if decline in car theft in the north does not lead to decline in house break-ins—notwithstanding the complementarities between these crimes—this would suggest that gang members substitute intentionally to this alternative criminal activity.

We begin by testing the assumption that car thefts and break-ins covary positively by simply regressing house break-ins per capita on car thefts per capita in locality j in month t. Table 4 Panel A shows that when broken down by treatment subgroup, or pooled across subgroups, household robberies are indeed increasing in car theft activity.[15] Importantly, as mentioned, if Northern gangs substitute from car theft to house robberies after the construction of the separation barrier, this elasticity should flip for Northern localities but remain unchanged for Southern and Outer areas. We use two strategies to test this possibility.

First, for each locality we construct a measure of the mean difference in house break-ins per capita before and after the construction of the separation barrier and regress it on equivalent mean difference in per capita car theft. Results, reported in columns 1-3 in Table 4 Panel B show that only in the Northern localities reduction in mean car theft does not lead to reduction in mean house break-ins. Second, and closely related, we regress house break-ins per capita in levels on the mean difference in car theft per capita (post and pre-barrier construction). Results, reported in columns 1-3 in Table 4 Panel C suggest that localities in the North with the greatest reduction in car theft have the highest levels of house break-ins. On the other hand, in the south and outer regions where we do not anticipate substitution from car theft to robbery, localities with the greatest average **increases** in car theft activity experience the largest increases in household predation.

Together, our findings suggest that while Northern gangs have had a hard time relocating car theft activities to the South, they were able to (somewhat) compensate the loss of revenue due to reduction in stolen vehicle smuggling by substituting away to other forms of crime.

[15] Pooled sample result available upon request.

Table 4: Elasticities of car theft and house break-ins

Panel A: Levels of breakins reg. on levels of car theft			
	Northern	Southern	Outer
Car thefts per capita	0.166***	0.130***	0.184**
	(0.035)	(0.018)	(0.090)
Constant	-2.070**	1.606*	1.894***
	(1.049)	(0.949)	(0.571)
N	11816	13169	11900
Clusters	292	325	295

Panel B: $\bar{\Delta}$ in breakins reg. on $\bar{\Delta}$ in car theft			
	Northern	Southern	Outer
Mean change in car theft	0.046	0.285***	0.207**
(post — pre)	(0.031)	(0.064)	(0.081)
Constant	-0.350	-0.051	-0.399
	(0.223)	(0.174)	(0.351)
N	288	321	290
Clusters	288	321	290

Panel C: Levels of breakins reg. on $\bar{\Delta}$ in car theft			
	Northern	Southern	Outer
Mean change in car theft	-0.161***	0.352***	0.102**
(post — pre)	(0.039)	(0.076)	(0.042)
Constant	-0.531	0.238	1.259***
	(0.768)	(0.299)	(0.255)
N	5760	6420	5800
Clusters	288	321	290

Note: Panel A is a simple correlation. Panel B evaluates the pre/post difference in means for house break-ins and car thefts per capita for each locality across treatment subgroups. Panel C evaluates the pre/post difference in means for car thefts per capita on house break-ins in levels. All models control to locality factors as described in the text.
- Robust standard errors in parentheses, clustered by locality.
* p<0.10, ** p<0.05, *** p<0.01

We believe that this findings is generalizable: gangs likely find it easier to adjust levels of production within known areas they already control than by penetrating to less familiar areas controlled by other gangs.

Conclusion

In this paper we take advantage of a visible border fortification anti-terror measure—the construction of a separation wall between Israel and the West Bank—to study how a dramatic exogenous shock to the costs of cross-border smuggling affects the illicit behavior of criminal gangs.

We show that criminals operating in areas proximate to the wall responded to the common shock of the barrier by significantly reducing lucrative auto theft activity. We further show important heterogeneity in the response of gangs operating in the North to the construction of the separation wall. We find that reductions in auto theft correspond closely to the extent to which the barrier disrupted preferred, shortest-path smuggling routes from Israeli towns to centers of the auto theft enterprise in the West Bank. The greatest reductions in the intensive margin of auto theft coincide with the most substantial increases in the capital input and opportunity costs of theft. These heterogeneous effects enhanced the common shock of the barrier entailed by increasing both the opportunity costs and risk of apprehension for smuggling vehicles through newly secured border crossings.

Because the border fortification infrastructure project we study was orthogonal to criminal activity, our expectation is that demand for stolen vehicles would remain unchanged. As evidence of this inelastic demand, we find that most of the reduction in auto theft in the protected North was displaced to yet-to-be-secured Southern localities. This finding underscores our argument that empirical strategies that focus on identifying localized effects (i.e., partial equilibria) may be quite misleading. It also speaks directly to contemporary policy debates surrounding the effectiveness of (limited) border walls—such as the one pushed forward by the Trump administration—to reduce cross-border illicit activity.

Importantly, we similarly show that criminal activity in the South did not increase uniformly. Instead, the localities that experienced the largest surge in auto theft after the construction of the separation barrier were at the mid-range of route distance to Hebron, a major hub of the auto theft industry in Palestine. We have argued that patterns of theft expansion are consistent with the idea that criminals are constrained by factors beyond the costs and risks associated with transit; in particular, 'carrying capacity' as well as the presence of rival operations. In sum, our spatial analysis allows us to also study "where crime goes" after the (limited) wall is constructed. We find evidence of a trade-off between three constraints: carrying capacity, pre-existing criminal activity, and the cost of smuggling. Although areas close to the border may seem attractive, they rely on relatively more private security, which raises of the risk of apprehension. Localities with high auto theft before the construction of the barrier likely have the most densely concentrated and well-organized criminal networks managing theft, making market penetration more difficult for an outsider and increased market yield risky for incumbent gangs (if the pretreatment period represents a carrying capacity threshold or equilibrium level of theft). Places that are further away experience less gang competition, but imply stronger input and opportunity costs. What we find is consistent with an optimization with respect to these three parameters, with the least per-capita increases in auto theft occurring in locations relatively close and farther away from the dismantling shops.

Given the considerable logistical uncertainty and costs associated with shifting illicit activity from one region to another, we have further argued that the observed crime displacement likely represents increased production of gangs already located in the South, rather than expansion of Northern gangs to new areas of operation. Analyzing granular police arrests data provides empirical evidence consistent with this contention. In sum, our results are consistent with actors facing relatively similar underlying production costs, recognizing the reduced flow of vehicles from a protected area (North) and increasing the production of criminal activity in the South to keep pace with global constant demand. We also find evidence suggesting that given the constraints on relocating activities, Northern gang likely have increased production in alternative criminal activities, such as burglaries.

Finally, it is important to note that many human activities other than illicit smuggling are affected by extensive border fortification measures. In the Israeli case, the separation barrier has also made it more difficult for Palestinian households to access their arable land and to work in Israel and for families on both sides of the barrier to reunite. Thus any analysis of the impact of border fortification measures on aggregate welfare may need to take a more holistic approach than the limited focus on crime adopted herein.

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SUPPORTING INFORMATION

— For Online Publication —

A Data

To implement our empirical strategy, we use data on auto theft and the separation barrier construction sequence, and combine them with locality-level indicators.

Unit of analysis

Our unit of analysis is locality-month, and we examine the period from October 2000 through January 2004. Localities are local administrative units that the Israeli Ministry of Interior classified as municipalities, local councils, or regional councils. The latter are comprised of smaller communities in the same region. The main factor that affects this designation is a locality's number of residents. Municipalities are relatively large cities (usually above 20,000 residents), whereas local councils are usually smaller urban townships (between 2,000 and 20,000 residents). Rural communities and villages with fewer than 2,000 residents are often grouped together with other similarly small communities in their area into regional councils. These thresholds apply for most local authorities, with a few exceptions. Some relatively large towns with above 20,000 residents remain local councils to preserve their small community character (for example, the town of Ramat HaSharon). In other cases, small communities of historical importance, but with fewer than 2,000 residents, are still designated as local councils and not merged with others into a regional council to maintain their independent status (for example, Metula).

Dependent variable — auto theft

Our main dependent variable is auto thefts per 1,000 residents in locality i in month t. We obtained these data from the Israeli police using the Freedom of Information Law. Police records encompass the entire universe of reported auto thefts in Israel. These records are comprehensive because reporting to the police is required in order to file an insurance claim. A further advantage of our data is that we have the number of stolen vehicles reported in every locality-month. This allows us to conduct a very disaggregated test of how the progress of barrier construction affects auto theft in geographically-disaggregated units.

For our purposes, we use data on all Jewish and mixed localities in Israel, excluding Israeli

Arab localities and Israeli settlements in the West Bank. We exclude non-Jewish localities because crime reporting may be incomplete. Indeed, the mean number of vehicle thefts per 1,000 residents in mixed and Jewish localities is 0.70, and it is 0.53 in non-Jewish localities (this difference is quite significant, $p<0.000$). Thus, auto thefts in non-Jewish localities may be under-reported. In addition, we exclude West Bank settlements because the effect of the barrier on auto theft may be different in these places. In our main estimations, we use Jewish Israeli localities, and in robustness checks we also include mixed localities (Jewish-Arab). The number of localities varies over the years, and in our sample there are between 914 and 1,050 localities in each year.

Explanatory variable — protection by the barrier

Our main independent variable of interest is whether locality i is protected by the barrier in month t. We obtained data and maps on the different stages of barrier construction (see "Israel's Separation Barrier" in the main text)). We received the data from the GIS unit at the United Nations Office for the Coordination of Humanitarian Affairs (OCHA oPt), and from Peace Now (an NGO that monitors the Israeli-Palestinian conflict). In addition, we consulted the Israeli Ministry of Defense webpage that describes the process of barrier construction (Israeli Ministry of Defense, 2016).

Using these data, we assigned each Israeli locality to one of three groups: treatment, control or "Outer" (see Figure 1). Treatment group comprises of all Israeli localities approximately 25 kilometers to the west and north of the barrier in the Northern part of the West Bank (the distance was chosen to reflect the distance to the coastline). The control group includes all Israeli localities within 40 kilometers to the west and south of the West Bank in the Southern part. The greater distance in the south reflects the fact that the coastline there is farther away from the West Bank than in the north. All Israeli localities that are not classified as treatment or as control are coded as "Outer". The process of assigning is described in the main text ("Assignment of Treatment Status" section in the main text). We also create an indicator for the post-treatment period equal one for all months post August 2002, and equal zero for August 2002 or prior.

Control variables

We control for a number of factors that can affect auto theft. First, we identify Jewish and mixed localities using the data in the Local Authorities datasets (Central Bureau of Statistics, 1998-2004), and we limit our investigation to Jewish and mixed localities, as explained above.

Second, we control for one-year lagged population size (in 10,000). Number of residents is directly related to the number of vehicles in a locality, and thus can account for the number of stolen vehicles. Third, we include an indicator for urban localities based on locality coding of the Central Bureau of Statistics (CBS). We control for urban localities because it may be easier to steal a vehicle in urban settings than in rural communities where residents tend to know each other and can easily spot an outsider. Fourth, we control for whether a locality is part of a regional council because, similarly to rural localities, it may be easier to steal a vehicle in small communities. Finally, we also control for locality's distance to the West Bank by including the distance in kilometers and square distance. As we discuss in the main text, most stolen vehicles are taken to the West Bank, and thus distance is important to account for auto theft.

In robustness checks, we also control for locality's socio-economic status using the CBS coding of the socio-economic cluster that ranges from 1 (the least wealthy) to 10 (the most wealthy). The main indicators that the CBS uses to measure the socio-economic level of localities are: financial resources of residents, housing, home appliances, motorization level, schooling and education, employment, socio-economic distress, and various demographic characteristics.[16] This variable is available for municipalities, local councils, and regional councils, not for the small localities that are parts of regional councils (in some cases, these are small communities of several dozen families). For these small localities, we use the regional council cluster, and assume all small localities within the same regional cluster have the same socio-economic status. Although we do not introduce these results in the main text, we include this in this SI as Table SI-12

We also show that our results are robust to controlling for terrorism. We use two measures of terrorism: the number of suicide attacks and the number of all terror attacks in a locality and in a locality's district. Data on attacks was coded using the archive of the Israeli news website Ynet (2000-2005). Our suicide attacks data is comparable to other dataset of suicide attacks in Israel that do not contain information on the location of the attack (for example, Benmelech, Berrebi and Klor (2010)).

Summary statistics table is available in the main text (see Table 1).

[16] http://www.cbs.gov.il/publications/local_authorities06/pdf/e_mavo.pdf.

B Robustness checks

Table SI-1: Origin of Car-Theft Suspects Arrested Before and After Barrier Construction

Suspect's origin	**Pre-barrier period** (October 2000-August 2002)	**Post-barrier period** (September 2002-January 2004)	**Total**
West Bank	13% (38)	16% (45)	14% (83)
Israel	87% (251)	84% (241)	86% (492)
Total	100% (289)	100% (286)	100% (575)

Note: All suspects arrested in the North area on auto-theft related charges before and after the barrier construction, based on data obtained from the Israeli police.

Table SI-2: Barrier Construction and Auto Theft: Deterrence or Displacement – Addressing Breaks in Parallel Trends with Lags of Outcome

	Diff-in-Diff North Vs. South	North Vs. Outer	South Vs. Outer	Fixed Effects North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.250***	0.138***	-0.120***			
	(0.028)	(0.018)	(0.027)			
Post	0.319***	0.149***	-0.087**	0.751***	0.847***	0.149
	(0.048)	(0.033)	(0.043)	(0.134)	(0.176)	(0.115)
Treatment × Post	-0.553***	-0.288***	0.263***	-0.556***	-0.285***	0.265***
	(0.053)	(0.037)	(0.051)	(0.053)	(0.036)	(0.051)
Constant	2.618***	4.199***	-1.240	0.520***	0.042	0.337***
	(0.996)	(0.761)	(0.954)	(0.142)	(0.160)	(0.127)
N	24901	23630	24969	24901	23630	24969
Clusters	608	577	609	608	577	609

Note: The three left column use “regular” Diff-in-Diff regressions, while the three right columns report instead results from equivalent fixed effect models (locality and date). North Vs. South columns compare treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the southern border with the West Bank); North Vs. Outer columns compare instead treatment localities to unprotected areas that are outside the control polygon; and South Vs. Outer columns examine two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01

Table SI-3: Barrier Construction and Auto Theft: Deterrence or Displacement – Addressing Breaks in Parallel Trends by Dropping Unparallel Periods

	Diff-in-Diff North Vs. South	North Vs. Outer	South Vs. Outer	Fixed Effects North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.319***	0.229***	-0.136***			
	(0.043)	(0.039)	(0.034)			
Post	0.323***	0.175***	-0.130***	0.844***	0.884***	0.249*
	(0.057)	(0.042)	(0.048)	(0.156)	(0.201)	(0.130)
Treatment × Post	-0.686***	-0.433***	0.286***	-0.687***	-0.430***	0.287***
	(0.081)	(0.071)	(0.059)	(0.081)	(0.070)	(0.059)
Constant	1.686	4.736***	-2.021*	0.747***	0.182	0.405***
	(1.220)	(0.900)	(1.032)	(0.165)	(0.190)	(0.136)

Note: The three left column use "regular" Diff-in-Diff regressions, while the three right columns report instead results from equivalent fixed effect models (locality and date). North Vs. South columns compare treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the southern border with the West Bank); North Vs. Outer columns compare instead treatment localities to unprotected areas that are outside the control polygon; and South Vs. Outer columns examine two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.
- Robust standard errors in parentheses, clustered by locality.
* p<0.10, ** p<0.05, *** p<0.01

Table SI-4: Accounting for Unobserved Industrial Organization of Crime with Arab Localities

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.099	0.257	0.199			
	(0.263)	(0.306)	(0.212)			
Post	0.251**	-0.042	-0.038	0.911***	0.250***	0.561**
	(0.096)	(0.032)	(0.032)	(0.245)	(0.086)	(0.208)
Treatment × Post	-0.708***	-0.415**	0.292***	-0.708***	-0.415**	0.293***
	(0.182)	(0.157)	(0.102)	(0.182)	(0.157)	(0.102)
Constant	0.479**	0.865**	0.879**	0.556***	0.412***	0.364***
	(0.220)	(0.325)	(0.363)	(0.057)	(0.071)	(0.092)
N	24985	23716	25069	24985	23716	25069
Clusters	47	40	22	47	40	22

Note: A novel map is constructed to address potential clustering in the industrial organization of crime (Figure 9). A Voronoi method is used to assign localities to one of several dozen crime zones hotspots. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by Arab locality zone.

* p<0.10, ** p<0.05, *** p<0.01

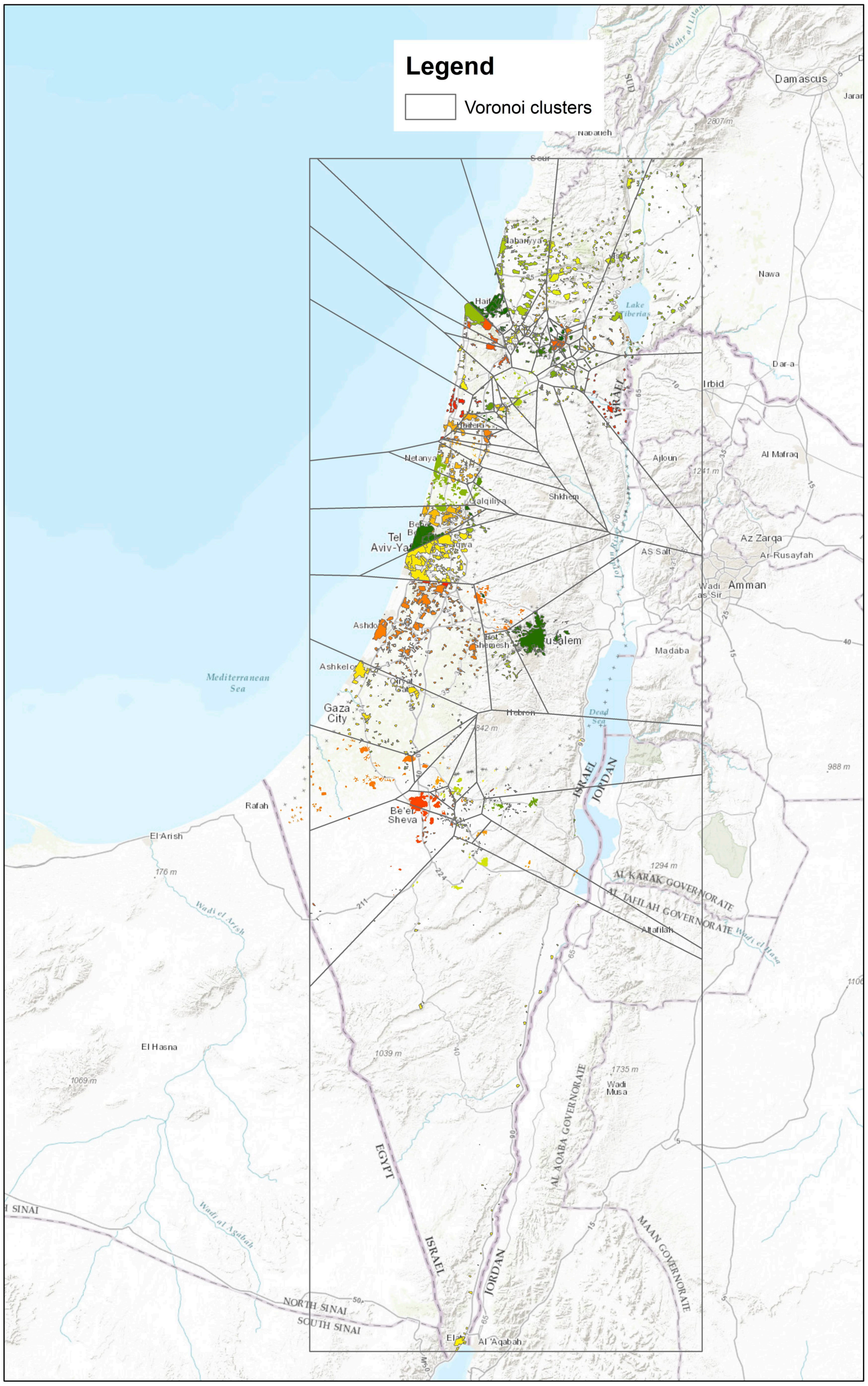

Figure 9: Figures shows clustering of localities in Israel using the Veroni Voronoi.

Table SI-5: Excluding Be'er Sheva from Main Analysis

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.102	0.257*	0.192**			
	(0.113)	(0.141)	(0.096)			
Post	0.252***	-0.042	-0.037	0.911***	0.250***	0.562***
	(0.048)	(0.031)	(0.031)	(0.105)	(0.076)	(0.093)
Treatment × Post	-0.708***	-0.415***	0.293***	-0.709***	-0.415***	0.294***
	(0.081)	(0.072)	(0.057)	(0.081)	(0.072)	(0.057)
Constant	0.498**	0.865***	0.891***	0.556***	0.412***	0.362***
	(0.201)	(0.204)	(0.209)	(0.054)	(0.053)	(0.051)
N	24944	23716	25028	24944	23716	25028
Clusters	616	587	619	616	587	619

Note: This analysis excludes the locality Be'er Sheva, an auto theft hotspot. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01

Table SI-6: Excluding Central Localities from Main Analysis

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.099	0.682***	0.530***			
	(0.113)	(0.132)	(0.080)			
Post	0.251***	-0.014	-0.009	0.911***	0.243***	0.584***
	(0.048)	(0.027)	(0.027)	(0.105)	(0.080)	(0.098)
Treatment × Post	-0.708***	-0.443***	0.264***	-0.708***	-0.443***	0.265***
	(0.081)	(0.070)	(0.055)	(0.081)	(0.070)	(0.055)
Constant	0.479**	0.281	0.390**	0.556***	0.388***	0.339***
	(0.200)	(0.188)	(0.193)	(0.054)	(0.052)	(0.050)
N	24985	21664	23017	24985	21664	23017
Clusters	617	536	569	617	536	569

Note: This analysis excludes central localities, located between the treatment and control bounding boxes, from the set of Outer localities. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.
- Robust standard errors in parentheses, clustered by locality.
* $p<0.10$, ** $p<0.05$, *** $p<0.01$

Table SI-7: Including Mixed Religion Localities from Main Analysis

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.097	0.254*	0.193**			
	(0.112)	(0.139)	(0.094)			
Post	0.254***	-0.043	-0.038	0.544***	0.248***	0.244***
	(0.048)	(0.031)	(0.031)	(0.087)	(0.075)	(0.093)
Treatment × Post	-0.709***	-0.413***	0.296***	-0.710***	-0.413***	0.297***
	(0.080)	(0.071)	(0.057)	(0.081)	(0.072)	(0.057)
Constant	0.464**	0.857***	0.884***	0.553***	0.406***	0.365***
	(0.197)	(0.202)	(0.204)	(0.053)	(0.054)	(0.050)
N	25149	23921	25356	25149	23921	25356
Clusters	621	592	627	621	592	627

Note: This analysis adds non-Jewish, mixed communities to the main analysis. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01

Table SI-8: Accounting for intensity of terrorist attacks, suicide bombings within-locality

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.099	0.258*	0.199**			
	(0.113)	(0.141)	(0.095)			
Post	0.251***	-0.042	-0.038	0.911***	0.250***	0.560***
	(0.048)	(0.031)	(0.031)	(0.105)	(0.076)	(0.093)
Treatment × Post	-0.708***	-0.416***	0.292***	-0.708***	-0.415***	0.293***
	(0.081)	(0.072)	(0.057)	(0.081)	(0.072)	(0.057)
Constant	0.479**	0.865***	0.879***	0.556***	0.414***	0.362***
	(0.200)	(0.204)	(0.208)	(0.054)	(0.053)	(0.050)
N	24985	23716	25069	24985	23716	25069
Clusters	617	587	620	617	587	620

Note: This analysis adds a control for the total number of suicide attacks within-locality, by month. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01

Table SI-9: Accounting for intensity of terrorist attacks, suicide bombings within-district

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.102	0.256*	0.188*			
	(0.112)	(0.140)	(0.096)			
Post	0.249***	-0.039	-0.044	0.548***	0.153**	0.156*
	(0.048)	(0.031)	(0.032)	(0.088)	(0.062)	(0.085)
Treatment × Post	-0.710***	-0.412***	0.291***	-0.708***	-0.417***	0.293***
	(0.080)	(0.071)	(0.057)	(0.081)	(0.072)	(0.057)
Constant	0.489**	0.852***	0.917***	0.556***	0.413***	0.363***
	(0.201)	(0.205)	(0.213)	(0.054)	(0.053)	(0.050)
N	24985	23716	25069	24985	23716	25069
Clusters	617	587	620	617	587	620

Note: This analysis adds a control for the total number of suicide attacks within-district, by month. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01

Table SI-10: Accounting for intensity of terrorist attacks, attacks within-locality

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.099	0.259*	0.199**			
	(0.113)	(0.141)	(0.095)			
Post	0.251***	-0.043	-0.038	0.911***	0.250***	0.561***
	(0.048)	(0.031)	(0.031)	(0.105)	(0.076)	(0.093)
Treatment × Post	-0.709***	-0.416***	0.293***	-0.708***	-0.415***	0.293***
	(0.081)	(0.072)	(0.057)	(0.081)	(0.072)	(0.057)
Constant	0.483**	0.866***	0.880***	0.557***	0.415***	0.364***
	(0.200)	(0.204)	(0.208)	(0.054)	(0.053)	(0.050)
N	24985	23716	25069	24985	23716	25069
Clusters	617	587	620	617	587	620

Note: This analysis adds a control for the total number of terrorist attacks within-locality, by month. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01

Table SI-11: Accounting for intensity of terrorist attacks, attacks within-district

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.114	0.256*	0.212**			
	(0.116)	(0.140)	(0.094)			
Post	0.266***	-0.009	-0.049	0.667***	0.384**	0.174
	(0.050)	(0.034)	(0.033)	(0.120)	(0.160)	(0.114)
Treatment × Post	-0.710***	-0.408***	0.287***	-0.710***	-0.406***	0.293***
	(0.081)	(0.071)	(0.057)	(0.081)	(0.070)	(0.057)
Constant	0.442**	0.816***	0.905***	0.495***	0.109	0.364***
	(0.203)	(0.206)	(0.210)	(0.098)	(0.141)	(0.091)
N	24985	23716	25069	24985	23716	25069
Clusters	617	587	620	617	587	620

Note: This analysis adds a control for the total number of terrorist attacks within-district, by month. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01

Table SI-12: Accounting for changes in socio-economic development

	Diff-in-Diff			Fixed Effects		
	North Vs. South	North Vs. Outer	South Vs. Outer	North Vs. South	North Vs. Outer	South Vs. Outer
Treatment	0.036	0.205	0.203**			
	(0.108)	(0.138)	(0.095)			
Post	0.240***	-0.065**	-0.044	0.809***	0.477***	0.253**
	(0.048)	(0.032)	(0.032)	(0.141)	(0.102)	(0.116)
Treatment × Post	-0.705***	-0.404***	0.295***	-0.706***	-0.417***	0.292***
	(0.081)	(0.072)	(0.057)	(0.081)	(0.073)	(0.057)
Constant	-0.203	-0.081	0.815***	0.805***	0.620***	0.386***
	(0.262)	(0.251)	(0.201)	(0.144)	(0.106)	(0.110)
N	24917	23648	24987	24917	23648	24987
Clusters	616	586	618	616	586	618

Note: This analysis adds a control for year-over-year variation in economic and social development, by zone. Model 1-3 use "regular" Diff-in-Diff regressions, while Models 4-6 report instead results from equivalent fixed effect models (locality and date). Models 1 and 4 use a binary treatment measure that allows comparing treatment (localities protected by the northern part of the barrier) to control localities (unprotected areas west of the Southern boarder with the West Bank); Models 2 and 5 compare instead treatment localities to unprotected areas that are outside the control polygon; and Models 3 and 6 compare two types of unprotected areas: control localities and Outer localities. All models control to locality factors as described in the text.

- Robust standard errors in parentheses, clustered by locality.

* p<0.10, ** p<0.05, *** p<0.01