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Spatial Spill-overs from Terrorism on Tourism:

Western Victims in Islamic Destination Countries

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Abstract

We analyze spatial spillover effects in international tourism as a consequence of transnational terrorist attacks. Specifically, we hypothesize that attacks executed in Islamic countries on citizens from Western countries will generate spatial spillovers of three kinds. Firstly, tourism from the victims' countries to Islamic destination countries other than the location of the attacks will decline. Secondly, tourism from other Western countries to the country in which the attacks took place will decline. Thirdly, tourism from other Western countries to other Islamic destination countries also will decline. These spatial spillover effects occur because the terror message is strategically addressed at Western citizens in general rather than the tourists' countries of origin per se. Tourists update their priors after such attacks, rationally expecting a greater chance of becoming victimized in other Islamic countries as well, given the transnational character of Islamist terror groups and the limited capacity of governments in Islamic countries to prevent such attacks.

1 Introduction

Tourism is an important source of revenue for many predominantly Islamic countries. Jordan, Lebanon, Morocco, Tunisia and Bahrain generate more than 5% of their GDPs from tourism, the Maldives substantially more than that. However, dependence on income from tourism also makes these countries vulnerable to terrorism's negative impacts. Countries that in the past have suffered from terrorist attacks on tourists, Egypt and Turkey, for example, have experienced plummeting revenues from tourism.

Terrorists in these countries have a strong strategic incentive to target Western tourists. Not only will this generate considerable media attention, but such attacks also target the major sources of tourist inflows and the victims come from countries whose governments often support militarily, politically or economically the governments in Islamic countries that the terrorists wish to overthrow. If the terrorist threat is significant, official authorities in the countries where tourists originate will start issuing advice against travelling to the destination. Tourist operators will start taking tours to the country out of their programs owing to insufficient bookings, fear of liability suits and the like; they promote travel to other destinations instead.

We demonstrate in this paper that terrorism in a predominantly Islamic country against citizens from a specific Western country of origin does not merely affect tourism to the country in which the attack takes place or tourism from the victims' country of origin. Instead, the tourism-deterring effect spatially spills over into other Islamic destination countries and other Western origin countries. The decline in the number of tourists is largest for tourist inflows to the country where one's citizens have been killed by the terrorist attacks from that same source country. However, the cross-border spillovers from transnational terrorism also are substantively important.

These results suggest that tourists understand one aspect of the logic of transnational terrorism fairly well: Terrorist attacks on Western tourists in Islamic countries typically are executed by terror groups with transnational strategic objectives. [1] They have an arbitrary character and terrorists therefore could have attacked other, similar targets in other, similar countries. As a consequence, if tourists respond to an observed terrorist attack, it does not make much sense to avoid only the country in which the attack took place, but also to bypass all sufficiently similar alternative destinations. Hence, tourists correctly infer that if terrorists attack their fellow citizens in one country they also have an incentive to attack them in other similar destination countries. Similarly, tourists from other Western origin countries infer that they are more likely to become victimized in that and other similar destinations. As a consequence, terrorist attacks on Western tourists in one country will reduce the number of Western tourists that take holidays in other, similar countries.

Our paper contributes and extends the literature on the impact of terrorism on tourism. Much of the existing literature uses qualitative research designs and finds effects on tourism in Ireland (Wall 1996), Cyprus (Mansfeld and Kliot 1996) and Egypt (Wahab 1996). Quantitative research confirms these findings for Turkey (Feridun 2011), Greece (Drakos and Kutan (2003), Israel (Bar-On 1996), Spain (Enders and Sandler 1991), Austria, Italy and Greece (Enders, Sandler and Parise 1992). The same conclusions are reached in studies of 134 destinations (Llorca-Vivero 2008) and global samples (Pizam and Smith 2000; Neumayer 2004). Yet, only Enders and Sandler (1991), Enders, Sandler

[1] For example, the so-called 'Islamic State' terror group recently published an ambitious '5-year plan', in which it lays out its objective of gaining control over all of Africa North of the equator including West Africa and the horn of Africa, the Arab peninsula, plus Pakistan, Afghanistan, India, Sri Lanka and Bangladesh, all territories surrounding the Black Sea, the entire Balkans and even other parts of Europe, including Portugal and Spain, which once belonged to the territory of Al-Andalus.

and Parise (1992) and Drakos and Kutan (2003) allow for terrorist externalities to other countries. Our paper is – to our best knowledge – the first to take a spatial dyadic approach to analyze the cross-border externality effect of terrorist attacks. Accordingly, we do not ask whether a terrorist attack in one country affects tourism in similar destination countries. Rather, we ask whether a terrorist attack on citizens from one country affects tourism from the same place of origin to other similar destinations, tourism from other similar origins to the same destination, and tourism from other similar origins to other similar destinations.

2 The strategic logic of terrorist attacks on tourists

Almost all terrorist groups have territorial goals: in the long run, they intend to take over the governments in the country or region from which they originate. However, terrorism is the political instrument of the militarily weak. Therefore, terrorist groups are unlikely to reach their ultimate goals in the short run. In the absence of realistic chances of achieving their long-term goals of gaining political power and control over a territory in the short run, terrorist groups strive for achieving strategic goals (Kydd and Walter 2006; Enders and Sandler 2006; Neumayer and Plümper 2011; Plümper and Neumayer 2010a).

These strategic goals can be divided loosely into two broad categories: The first strategic goal aims at organizational survival. This category includes recruiting new terrorists, winning support, especially financial, from peers, gaining access to safe havens, and attracting media attention to spread the group's ideology. The second strategic goal aims at weakening the governments the terrorist groups intend to overthrow. This category includes killing selected representatives of the government, destroying infrastructure, reducing the military support the governments receive from other nations, reducing the financial capabilities of the government, and so on. Crucially, it also includes weakening the economy on which governments depend for revenue.

Attacking tourists fulfils many of these goals. In fact, the strategic goals are often best served if terrorist groups attack 'Western' targets.[2] Western targets are attractive for terror groups in general and for Islamist terror groups in particular for various reasons: First, 'the West' supports many otherwise weak governments in Islamic nations, thereby stabilizing political order in these countries and preventing radical Islamist groups from gaining access to power. Second, most media companies are owned by Western corporations. Therefore, killing Western citizens is much more likely to attract global media attention than killing non-Westerners. Third, potential peers and potential recruits of radical Islamist groups typically are united by anti-Western sentiments. In addition, Western citizens, even civilians, are more easily dehumanized as apostates and as the symbols of everything against which the groups fight. In sum, Western targets are strategically promising for Islamist terror groups.

Arguably, terrorist groups achieve greater influence on peers, supporters and potential recruits when they attack 'hard targets', as this demonstrates the capability of the terror group to overcome seemingly stringent security measures. Soft targets, such as tourist hotels or major sites that tourists visit, can be attacked without much preparation; an automatic gun or a bomb and a terrorist willing to commit suicide or to get arrested will usually do. Moreover, the cost advantages of attacking soft targets are reinforced by the

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2 We develop this argument in greater detail in Plümper and Neumayer (2010a) and Neumayer and Plümper (2011).

effect such attacks have on the targeted country's revenue stream from tourism. Tourists are sensitive to terror threats and flexible in their destination choices. Thus, attacks on soft targets predominantly aim at reducing the financial capabilities of the tourist destinations' governments. The value of terrorist attacks on tourists goes beyond the fact that Western tourists are symbols of Western culture and are easily identifiable as different in predominantly Islamic countries. Attacks on tourists are attacks on an important source of revenue for the government.

3 Data and methods

Our dependent variable is the annual number of tourists from Western source or origin countries arriving in destination countries belonging to the Islamic civilization, or Islamic destination countries for short. Information comes from WTO (2015) and covers the years from 1995 to 2013. In order to determine the civilizational identities of nation states, we rely on two data sources that differ slightly in how countries are classified, namely the more restrictive classification by Henderson and Tucker (2001) and the broader classification by Russett, Oneal and Cox (2000), both of which operationalize the somewhat ambiguous verbal and map classification provided by Huntington (1993, 1996) in his article and book on the so-called clash of civilizations. See the appendix for the classification of countries.

Our main variables of interest are the terrorist spatial spillover variables. Formally, these are called "spatial-x variables" since they capture spatial spillovers in an explanatory variable from other dyads on the dependent variable rather than spillovers in the dependent variable itself. We estimate the following equation:

$$y_{ijt} = \beta_{1,2} terr_{ijt,t-1} + \beta_{3,4} \sum_{m \neq j} terr_{imt,t-1} + \beta_{5,6} \sum_{k \neq i} terr_{kjt,t-1} + \beta_{7,8} \sum_{m \neq j, k \neq i} terr_{kmt,t-1} + X_{it} + X_{jt} + \eta_{ij} + T_t + \varepsilon_{ijt}$$

where y_{ijt} is the annual number of tourists from Western source countries *i* to Islamic destination countries *j*, $terr_{ijt,t-1}$ is the number of either fatal terrorist incidents or terrorist killings involving citizens of country *i* in destination country *j* (both in years t and years t-1), X_{it} and X_{jt} are vectors of source- or destination-specific control variables, η_{ij} are dyad fixed effects, T_t are year fixed effects and ε_{ijt} is an idiosyncratic error term. These controls effectively prevent the spatial spillover effects from spuriously picking up spatial clustering (Plümper and Neumayer 2010b) and effectively control for the main sources of potential endogeneity (Baier and Bergstrand 2007).[3]

Our three main variables of interest are the three spatial-x variables. Specifically, $\sum_{m \neq j} terr_{imt,t-1}$ captures what Neumayer and Plümper (2010) have termed specific target contagion, $\sum_{k \neq i} terr_{kjt,t-1}$ captures specific source contagion, and $\sum_{m \neq j, k \neq i} terr_{kmt,t-1}$ captures exclusive directed dyad contagion. The first spatial-x variable (specific target contagion) counts the number of either fatal terrorist incidents or terrorist killings involving citizens of country *i* in Islamic destination countries other than the country *j* that comprise the dyad under observation. This variable tests whether terrorist attacks on citizens from a specific Western country in other Islamic destination countries deter

[3] One could additionally include source- and destination-specific year fixed effects to account for what is known in the gravity literature as time-varying 'multilateral resistance' (Anderson and van Wincoop 2003; Klein and Shambaugh 2006; Baier and Bergstrand 2007). Such a model would include the maximum number of fixed effects that panel data allow and then only the effect of variables that vary at the dyad level over time can be estimated. Unfortunately, the (Pseudo-) Poisson maximum likelihood models did not converge with this extreme number of fixed effects included. In our experience, this is not an uncommon occurrence and represents a drawback of the (Pseudo-) Poisson maximum likelihood estimator that is otherwise well suited for gravity-type models (Santos Silva and Tenreyro 2006, 2010).

tourism from this country to the Islamic country under observation. The specific source contagion variable counts the number of either fatal terrorist incidents or terrorist killings involving other Western citizens in the Islamic destination country j that forms the dyad under observation. It tests whether terrorist attacks on other Western citizens in a specific Islamic destination country deter tourism from the Western country under observation to that destination country. The exclusive directed dyad contagion variable counts the number of either fatal terrorist incidents or terrorist killings involving other Western citizens in Islamic destination countries other than the dyad under observation. It tests whether terrorist attacks on other Western citizens in other Islamic destination countries deter tourism from the Western country under observation to the Islamic destination country under observation.

We enter both the contemporaneous and the one-year lag of the terrorism and spatial spillover variables. Media attention is greatest in the immediate aftermath of attacks. However, many tourists will be locked into bookings previously arranged and may be unwilling to accept the already incurred costs as sunk. It also takes time to realize the full extent of the terrorist threat. Enders and Sandler's (1991) and Enders, Sandler and Parise's (1992) time-series analyses of the impact of terrorism on tourism in Spain and other Western countries suggest that often three to nine months pass by until tourist arrivals go down markedly.

Our measures of terrorism are based on the "International Terrorism: Attributes of Terrorist Events" (*Iterate*) dataset (Mickolus et al. 2014a). It includes as acts of terror "the use, or threat of use, of anxiety-inducing, extra-normal violence for political purposes by any individual or group, whether acting for or in opposition to established governmental authority, when such action is intended to influence the attitudes and behavior of a target group wider than the immediate victims" (Mickolus et al. 2014b, p. 2). Terrorist violence includes incidents as diverse as, among others, assassinations, bombings and armed attacks, arson and fire, kidnapping, and skyjacking, unless they are acts of ordinary crime or the violence is for purposes other than political, e.g., for drug trafficking. We focus exclusively on terrorist incidents that resulted in fatalities as these are those most likely to generate widespread media attention. Violence committed during international conflicts and civil wars are not coded as terrorism. Consequently, guerrilla attacks by rebel groups are not counted either, unless they are targeted against civilians or the dependents of military personnel (Mickolus et al. 1989, p. xii).

The dataset compiles a wealth of information on each terrorist incident. What is most important for our purposes, it codes the country where the terrorist incident took place, the three primary nationalities of victims, as well as the number of people killed. Unfortunately, it does not list the precise number of fatalities belonging to each nationality. We therefore attributed all fatalities to all three of the victims' primary nationalities in the relatively small number of cases for which more than one nationality of victims is recorded.

We code from the dataset two variables: the annual number of terrorist incidents that resulted in fatalities and the annual total of people killed. One reason for employing both variables is that for the latter, *Iterate* indicates that, for a few terrorist attacks (less than 2%), the number of fatalities is unknown. For the killings variable, we coded these cases as involving one death.

The information on the targeted countries and the nationalities of terrorist victims, combined with information on the civilizational identities of countries, allows us to create the directed country dyadic spatial-x variables of terrorist acts against Western victims in countries belonging to the Islamic civilization that we described above. We lose observations on terrorist acts for which *Iterate* does not provide information on the primary nationality of victims, but these are very few in number and unlikely to involve Western victims.

Our source- and destination-specific control variables follow a gravity-type model common in economics for explaining the dyadic flow of goods and services. Specifically, we include the (log of) population size and of GDP per capita in constant USD in both sending and destination countries, taken from World Bank (2015). So that our measures of terrorism and spatial terrorist spillovers do not spuriously pick up any effect from armed civil conflicts, we additionally include a variable that measures the ordinal intensity of armed conflict in a country based on the Peace Research Institute Oslo (PRIO)/Uppsala dataset. The general attractiveness of a destination country for a specific source country in terms of climate, cultural and historical attractions, geographical distances, and so on, are captured by dyadic fixed effects. Global ups and downs in the tourism sector are captured by the year fixed effects.

Table 1 reports descriptive statistics for all main variables. In our sample and over the period of our study (1995 to 2013), we observe a total of 190 dyadic fatal terrorist incidents involving Western victims in Islamic destination countries, resulting in 1,402 fatalities, although, as noted above, some double counting is unavoidable since all fatalities are allocated to all three main nationalities of victims in cases where more than one nationality is involved. These are considerable numbers, but clearly they are dwarfed by the number of fatal incidents and killings in which the victims come from the same or, to lesser extents, other Islamic countries. By far, the main victims of Islamist terror are Muslims, not nationals of the Western or other civilizations.

We follow Santos Silva and Tenreyro (2006, 2010) and estimate equation (1) with a (Pseudo-) Poisson maximum likelihood estimator, which correctly accounts for the existence of heteroscedastic residuals. Standard errors are adjusted by clustering observations on dyads.

4 Results

Our estimation results are presented in Table 2. The first two columns report results employing the number of fatal terrorist incidents and the number of terrorist killings based on the civilizational coding of Henderson and Tucker (2001), whereas the last two columns do the same, but based on the coding of Russett, Oneal and Cox (2000). The control variables all have the expected effects. More tourism emanates from and goes to larger and richer countries, while armed conflict in a country deters tourism flows.

Focusing first on the more restrictive coding provided by Henderson and Tucker (2001), fatal terrorist incidents in the prior and in the same year involving victims from country *i* have the expected negative deterrent effect on tourist flows in this country dyad. The Poisson is a non-linear estimator, but its coefficients can be interpreted as semi-elasticities. One additional fatal incident is predicted to reduce the tourist flow by 4.2 % in the same year and by 7.4 % in the subsequent one.

We also find evidence for the expected negative specific target contagion effect: if nationals from country *i* have become victims of fatal terrorist incidents in other Islamic countries, this reduces the contemporaneous and subsequent flows of tourists in this country dyad. Substantively, the effect is weaker than if the fatal terrorist incident took place in the Islamic destination country under observation, which is of course as one would expect. One additional fatal incident in other Islamic destination countries is predicted to reduce the tourist flow from source country *i* to the destination country *j* under observation by 3.8 % in the same year and by 3.7 % in the next one.

The substantive effects are again smaller for specific source contagion. The estimated coefficient for the contemporaneous term is negative, but statistically insignificant. There is less noise in the estimation of the one-year lag. Tourists from other Western countries are deterred by fatal terrorist incidents that involve other Western nationals in a specific Islamic destination country, with the estimated effect being 2.4 % for one additional fatal incident.

Lastly, we also find evidence that fatal terrorist incidents in Islamic countries affect Western tourism to Islamic destinations beyond the specific source and destination countries involved in the incident. Our estimates suggest that such tourism declines by 2.8 % both contemporaneously and with a one-year lag.

A very similar picture emerges if we take terrorist killings rather than fatal terrorist incidents as our measure of the terrorist threat, as estimation results reported in column 2 show. The substantive effects seem to be much smaller in that, for example, one further terrorist killing of nationals from the source country of the dyad itself is predicted to reduce the subsequent tourism flow to that destination country by only 0.4 % contemporaneously and with a one-year lag. However, one has to keep in mind that the range and the standard deviation are much larger for the terrorist killings variable than for the terrorist incidents variable. Expressed as predicted reductions in tourist flows following a one-standard deviation increase in our terrorist threat measures, the results are substantively similar.

The results also are similar if we employ Russett, Oneal and Cox's (2000) civilizational coding instead, as the remaining two columns show. The lag structure is somewhat different, but we continue to find statistically significant effects for the dyad under observation and for target and directed dyad contagion. The main difference is that we do not find statistically significant source contagion effects (the two lags also are not jointly statistically significant) when we employ this alternative coding. One reason that there is less clear evidence for source contagion, in comparison to target contagion, and that the estimated substantive effects are also smaller for source relative to target contagion is that the media attention is likely to be strongest in the country from which Western tourist victims originate. Thus, stories about attacks on British citizens, for example, will feature in German, French and other Western media but will receive most attention in the United Kingdom itself. This is likely to result in a stronger contagion effect among other target (destination) countries, reducing tourism from that source country, than the contagion effect among other source countries that reduces tourism from other source countries.

We have undertaken a number of robustness tests. First, we have tested for non-linear effects and, on the whole, found no such evidence. Second, we have tested for causal heterogeneity by running separate estimates for Islamic destination countries above and below the median of national dependence on tourism revenue, measured as the share of exports that stems from tourist revenue, averaged over the years from 2005 to 2012. We did not find systematic differences. Third, we have entered the lagged dependent variable as an additional way of shielding the estimates from spuriously finding evidence for spatial effects when there are none, following the advice in Plümper and Neumayer (2010b). The estimates are reported in Table 3. If anything, the evidence for our hypotheses of spatial spillover effects in the impact of terrorism on tourism is even clearer.

5 Conclusion

In this article we have tested the hypothesis that terror attacks have important spatial spillover effects, focusing entirely on Western tourism to Islamic destination countries. Western tourists, on average, seem to understand the strategic logic of Islamist terror groups. When they hit Western targets, the specific nationalities of their victims are somewhat arbitrary and so is the predominantly Islamic destination country in which they execute their acts of terror. The real targets are all Western tourists and all Islamic destination countries.

Terrorist attacks on tourist destinations in one country therefore do not reduce only tourist flows to the targeted tourist destinations and from the countries whose nationals have been attacked. Rather, such attacks have spatial spillover effects, reducing, if to a lesser extent, tourism flows from other similar source countries to the same destination country, tourism flows from the same source country to similar destination countries and even tourism flows from similar source countries to similar destination countries. This empirical finding provides further reasons for regional cooperation in anti-terrorism policies among Islamic destination countries since countries cannot shield themselves from the negative consequences of terrorism on tourism by preventing such attacks only in their own country.

Appendix. Coding of Countries/Nationalities as Western or Islamic.

Henderson and Tucker (2001)

'West' includes all of Western Europe, plus Australia, Barbados, Belize, Canada, Croatia, Czech Republic, Estonia, Hungary, Latvia, New Zealand, Poland, Slovak Republic, Slovenia, United States, Western Samoa.

'Islamic' includes Afghanistan, Albania, Algeria, Azerbaijan, Bahrain, Bangladesh, Brunei, Egypt, Gambia, Indonesia, Iran, Iraq, Jordan, Kuwait, Kyrgyz Republic, Lebanon, Libya, Malaysia, Maldives, Mali, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Sudan, Syria, Tajikistan, Tunisia, Turkey, United Arab Emirates, Uzbekistan, Yemen.

Russett, Oneal and Cox (2000)

'West' includes all of Western Europe, plus Australia, Barbados, Canada, Croatia, Czech Republic, Dominica, Estonia, Grenada, Hungary, Israel, Jamaica, Latvia, New Zealand, Papua New Guinea, Philippines, Poland, Slovak Republic, Solomon Islands, St. Kitts and Nevis, Trinidad, United States, Vanuatu, and Western Samoa.

'Islamic' includes Afghanistan, Albania, Algeria, Bahrain, Bangladesh, Brunei, Djibouti, Egypt, Gambia, Indonesia, Iran, Iraq, Jordan, Kuwait, Kyrgyz Republic, Lebanon, Libya, Malaysia, Maldives, Mali, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Senegal, Seychelles, Sudan, Syria, Tajikistan, Tunisia, Turkey, United Arab Emirates, Uzbekistan, Yemen.

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Table 1. Summary statistics.

	Obs	Mean	Std. Dev.	Min	Max
arrivals	11247	45,831	198,649	1	4,811,873
ln GDP pc (origin)	11247	10.15	0.85	6.64	11.97
ln GDP pc (destination)	11247	8.05	1.22	5.33	10.75
ln population (origin)	11247	16.00	1.89	10.33	19.57
ln population (destination)	11247	16.09	1.97	11.23	19.34
armed conflict (destination)	11247	0.25	0.52	0	2
annual sum fatal incidents	11247	0.02	0.15	0	4
annual sum killings	11247	0.12	3.09	0	202
target contagion (inc. Russett)	11247	0.66	1.76	0	16
source contagion (inc. Russett)	11247	0.46	1.16	0	8
dyad contagion (inc. Russett)	11247	19.34	10.71	1	49
target contagion (kill. Russett)	11247	4.17	16.87	0	203
source contagion (kill. Russett)	11247	2.92	18.46	0	407
dyad contagion (kill. Russett)	11247	121.86	114.05	1	492
target contagion (inc. Hend.)	9712	0.70	1.83	0	16
source contagion (inc. Hend.)	9712	0.43	1.11	0	8
dyad contagion (inc. Hend.)	9711	17.79	10.27	1	44
target contagion (kill. Hend.)	9712	4.34	17.50	0	203
source contagion (kill. Hend.)	9712	2.72	18.27	0	407
dyad contagion (kill. Hend.)	9711	111.10	107.76	1	483

Table 2. Estimation results

Civilizational coding:	Henderson	Henderson	Russett	Russett
Measure of terrorism:	fatal incidents	killings	fatal incidents	killings
ln GDP pc (origin) t	1.810***	1.792***	1.361***	1.400***
	(0.462)	(0.462)	(0.447)	(0.444)
ln GDP pc (destination) t	0.906***	0.934***	0.935***	0.961***
	(0.215)	(0.210)	(0.233)	(0.221)
ln population (origin) t	2.224**	2.166**	0.261	0.287
	(1.109)	(1.104)	(1.153)	(1.157)
ln population (destination) t	1.655***	1.621***	1.633***	1.643***
	(0.412)	(0.413)	(0.397)	(0.393)
armed conflict int. (destination) t	-0.215***	-0.225***	-0.162**	-0.175**
	(0.0811)	(0.0853)	(0.0774)	(0.0808)
annual sum (incidents/killings) t	-0.0423**	-0.00394**	-0.0236	-0.00136
	(0.0202)	(0.00172)	(0.0253)	(0.000898)
annual sum (incidents/killings) t-1	-0.0741***	-0.00436**	-0.0701***	-0.00514**
	(0.0194)	(0.00175)	(0.0200)	(0.00247)
target contagion t	-0.0380**	-0.00461**	-0.0226	-0.00182***
	(0.0171)	(0.00184)	(0.0180)	(0.000701)
target contagion t-1	-0.0372***	-0.00318*	-0.0226*	-0.00337
	(0.0128)	(0.00182)	(0.0118)	(0.00263)
source contagion t	-0.0120	-0.00309*	-0.00284	-0.000287
	(0.0171)	(0.00180)	(0.0173)	(0.000616)
source contagion t-1	-0.0235*	-0.00213	-0.0101	-0.00228
	(0.0133)	(0.00178)	(0.0117)	(0.00264)
directed dyad contagion t	-0.0277*	-0.00403**	-0.0179	-0.00124**
	(0.0161)	(0.00183)	(0.0168)	(0.000610)
directed dyad contagion t-1	-0.0277**	-0.00233	-0.0180*	-0.00265
	(0.0117)	(0.00182)	(0.0104)	(0.00263)
Observations	9,711	9,711	11,247	11,247
Dyads	703	703	828	828

Notes: (Pseudo-)Poisson maximum likelihood estimation with dyad and year fixed effects. *, **, *** notes statistical significance at the .1, .05 and .01 level.

Table 3. Estimation results with lagged dependent variable included

Civilizational coding:	Henderson	Henderson	Russett	Russett
Measure of terrorism:	fatal incidents	killings	fatal incidents	killings
arrivals t-1	2.78e-07***	2.74e-07***	2.67e-07**	2.63e-07**
	(9.46e-08)	(9.74e-08)	(1.22e-07)	(1.24e-07)
ln GDP pc (origin) t	2.057***	2.023***	1.404***	1.428***
	(0.487)	(0.491)	(0.464)	(0.463)
ln GDP pc (destination) t	1.082***	1.050***	1.090***	1.070***
	(0.172)	(0.166)	(0.205)	(0.191)
ln population (origin) t	3.939***	3.856***	1.703	1.695
	(1.166)	(1.180)	(1.249)	(1.262)
ln population (destination) t	2.002***	1.907***	1.883***	1.850***
	(0.390)	(0.389)	(0.391)	(0.386)
armed conflict int. (destination) t	-0.117*	-0.117*	-0.0807	-0.0857
	(0.0596)	(0.0632)	(0.0548)	(0.0581)
annual sum (incidents/killings) t	-0.0570***	-0.00674***	-0.0405	-0.00235***
	(0.0206)	(0.00172)	(0.0275)	(0.000876)
annual sum (incidents/killings) t-1	-0.0796***	-0.00640***	-0.0725***	-0.00778***
	(0.0233)	(0.00176)	(0.0257)	(0.00219)
target contagion t	-0.0416***	-0.00706***	-0.0315***	-0.00250***
	(0.0107)	(0.00164)	(0.0117)	(0.000658)
target contagion t-1	-0.0394***	-0.00485***	-0.0247***	-0.00564***
	(0.00850)	(0.00150)	(0.00850)	(0.00217)
source contagion t	-0.0177	-0.00611***	-0.0136	-0.00139**
	(0.0121)	(0.00169)	(0.0121)	(0.000649)
source contagion t-1	-0.0227**	-0.00458***	-0.0127	-0.00523**
	(0.00976)	(0.00157)	(0.00897)	(0.00230)
directed dyad contagion t	-0.0310***	-0.00667***	-0.0259**	-0.00205***
	(0.00977)	(0.00167)	(0.0111)	(0.000609)
directed dyad contagion t-1	-0.0349***	-0.00448***	-0.0263***	-0.00538**
	(0.00831)	(0.00154)	(0.00811)	(0.00225)
Observations	8,901	8,901	10,249	10,249
Dyads	689	689	805	805

Notes: (Pseudo-)Poisson maximum likelihood estimation with dyad and year fixed effects. *, **, *** notes statistical significance at the .1, .05 and .01 level.