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Journal of Peace Research 2011 48: 339 originally published online 28 March 2011
DOI: 10.1177/0022343310397404

journal of peace RESEARCH

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Journal of Peace Research
48(3) 339–353

DOI: 10.1177/0022343310397404
jpr.sagepub.com
SAGE

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Abstract

Recognizing that the empirical literature of the past several years has produced an inconclusive picture, this study revisits the relationship between poverty and terrorism and suggests a new factor to explain patterns of domestic terrorism: minority economic discrimination. Central to this study is the argument that because terrorism is not a mass phenomenon but rather is undertaken by politically marginal actors with often narrow constituencies, the economic status of subnational groups is a crucial potential predictor of attacks. Using data from the Minorities at Risk project, I determine that countries featuring minority group economic discrimination are significantly more likely to experience domestic terrorist attacks, whereas countries lacking minority groups or whose minorities do not face discrimination are significantly less likely to experience terrorism. I also find minority economic discrimination to be a strong and substantive predictor of domestic terrorism vis-à-vis the general level of economic development. I conclude with a discussion of the implications of the findings for scholarship on terrorism and for counter-terrorism policy.

Keywords

discrimination, economic development, minorities, terrorism

Though it remains a popular thesis among policymakers that poverty causes terrorism,[1] the empirical literature has been inconclusive regarding the link between socioeconomic factors and terrorism. Studies that use cross-national analysis to model the effects of macroeconomic indicators on terrorism fail to show conclusively that impoverished or underdeveloped countries experience higher rates of terrorism, or produce more terrorists, than do middle or high-income countries (Abadie, 2006; Dreher & Gassebner, 2008; Krueger & Laitin, 2008; Piazza, 2006). The same has been found to be the case for regions within countries (Krueger, 2007; Piazza, 2009). Studies examining individuals likewise do not reveal a causal link between poverty, inequality, and terrorism. Empirical research has not found that terrorist perpetrators are more likely than the average person to come from a lower socioeconomic background or to be uneducated, unemployed, and economically distressed, and survey research has also not determined that economically deprived people are more likely to support terrorism (Berrebi, 2007; Fair & Haqqani, 2006; Krueger & Maleckova, 2003; Sageman, 2004).

Still, a handful of other studies prevent scholars from confidently closing the book on the relationship between measures of economic deprivation and terrorism. Rather than finding a consistent null result, this body of work

[1] See, for example, public statements linking poverty, poor education and unemployment to terrorism made by former Presidents Bush and Clinton in the immediate aftermath of the 11 September 2001 terrorist attacks in the United States and British Prime Minister Tony Blair in the wake of the 7 July 2005 suicide bomb attacks in London. More recently, in a January 2009 Stanford address, former President of Pakistan Pervez Musharraf described poverty and illiteracy as key motivators of global terrorism. Senior counter-terrorism adviser to the Obama administration, John O Brennan, poses a more nuanced relationship regarding poverty, among a host of other factors, as a contributing factor to political grievances that themselves propel terrorist activity. See Spencer S Hsu & Joby Warrick, 2009, 'Obama's battle against terrorists to go beyond bombs and bullets', *Washington Post*, 6 August.

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reveals a more complicated picture. On the one hand, Li & Schaub (2004) determine that economically developed OECD countries are less likely to experience international terrorist attacks than developing countries, while Bravo & Dias (2006) find the same for terrorism in Eurasia. Burgoon (2006) demonstrates that social welfare spending reduces international terrorist attacks in some countries. Lai (2007) finds that countries with higher levels of economic inequality experience higher levels of terrorism than more egalitarian societies. Bueno de Mesquita (2005) argues that the selection regimes used by terrorist movements, which favor higher socio-economic status recruits, obscure the fact that larger pools of potential recruits are produced by poverty. However, Blomberg & Hess (2008a) determine that economically developed countries are *more* likely than developing countries to experience terrorist attacks.[2] Ross (1993) theoretically substantiates this empirical finding, noting that economically developed societies afford terrorists more targets, a greater availability of deadly weapons, and a mass transit and communication system to maximize the effectiveness of their attacks.

Yet other studies manage to find indicators of poverty to be simultaneously negative and positive predictors of terrorism. Using dyadic analyses of source and target countries, Li (2009), Derin-Güre (2009), Blomberg & Hess (2008b), and Blomberg & Rosendorff (2006) find that increased income levels in countries reduce the probability that their nationals will launch terrorist attacks abroad, but that countries with higher incomes, and higher levels of political democracy and economic openness, are more likely to be targeted by international terrorists. Taken together, these studies indicate a more complex relationship wherein economic underdevelopment incubates terrorist movements and motivates them to launch international attacks against developed countries because they feature developed, free media that are likely to cover attacks (Hoffman & McCormick, 2004), they are endowed with more numerous and lucrative targets (Sandler, 2005), and they are symbols of a non-egalitarian status quo and a focus for political resentments (Crenshaw, 2007).

The end result is that there is little scholarly consensus on the role that socio-economic factors play in determining patterns of terrorism. This is a glaring deficit on more than one front. First, it has contributed to a discovery lag vis-à-vis other social science literatures on violence, such as the work on civil war (Collier, Hoeffler & Rohner, 2009; Fearon, 2008; Fearon & Laitin, 2003; Sambanis, 2004) and the fields of criminology and sociology (Fajnzylber, Lederman & Loayza, 2002; Hsieh & Pugh, 1993). Second, looking beyond to policy-oriented research, the failure of terrorism scholars to definitively determine how, or whether, poverty and socio-economic inequality in countries precipitates terrorism handicaps evaluation of a key element of post-September 11th United States counter-terrorism that was inaugurated during the Bush Administration: increased US bilateral development aid as a panacea for terrorism (Bluestein, 2002; Piazza, 2006). Coupled with similar ambiguities regarding other predictors of terrorism, this has left terrorism studies unable to articulate a clear counter-terrorism policy recommendation.

Minority discrimination and terrorism

This study suggests that a heretofore overlooked factor may further elucidate the relationship between socio-economic features of countries and the occurrence of terrorist attacks: economic discrimination against minority groups. Though the experience of minority group discrimination has been identified as a factor that motivates and fuels terrorist campaigns in a host of qualitative studies of individual countries or individual terrorist movements (see, for example, Bradley, 2006; Buendia, 2005; Ergil, 2000; Laqueur, 1999; O'Hearn, 1987; Van de Voorde, 2005; Whittaker, 2001), it has largely been ignored in the growing cross-national, time-series quantitative literature investigating the root causes of terrorism. Aside from control findings in studies focused on democratic rule (Eubank & Weinburg, 1994), political stability (Lai, 2007), and national demographic composition as predictors of terrorism (Wade & Reiter, 2007), a cross-national empirical investigation of minority economic status as a cause of terrorism has not been systematically undertaken. This is striking, given the proliferation of cross-national empirical research on the causes of terrorism since 2001 (Young & Findley, 2011) and the prominence afforded to the individual experience of ethnic, racial or class discrimination as a predictor of aggressive behavior and future violent crime within the sociology, social psychology, and criminology literatures (Dubois et al., 2002; McCord & Ensminger, 2002; Simons et al., 2006).

There is some theoretical justification to suspect that a causal link exists between minority economic discrimination and domestic terrorist activity within countries and

[2] Though when they examine only developing countries, Blomberg & Hess (2008a) do find some evidence that indicators of economic development programs are negatively associated with terrorism.

an argument to be made that it should have a strong, substantive effect in comparison to general levels of poverty. To establish this link, I borrow from Gurr's (1993) theory of relative deprivation, which integrates group motivations for political violence with the collective opportunities to do so. In Gurr's model, collective or social status disadvantages – when accompanied by repression on the part of the state – help to produce cohesive minority group identities within countries that differentiate group members from larger society. These collective disadvantages, the sense of 'otherness' vis-à-vis the majority, and alienation from the state and mainstream society facilitate the creation of long-term grievances within afflicted subgroups. When these grievances are wedded to opportunities to mobilize, which, Gurr assumes, are conditioned by the size and demographic concentration of the group, political violence results. Though Gurr's model seeks to explain episodes of widespread mass political violence such as ethnic rebellions, riots, and civil wars rather than terrorist attacks, which are smaller in scale, more sporadic, and executed by small groups rather than mass movements, I argue that his two intervening factors in the relationship between relative deprivation and political violence – group grievance and organizational opportunity – are likewise key to understanding the causal link between minority economic discrimination and terrorism. I am partially assisted in this by Crenshaw (1981) and Ross (1993), both of whom argue that group grievances of marginalized subnational communities is the crucial root cause of terrorism. I add to this an argument that terrorist movements, as small organized actors led by elites that draw recruits from aggrieved subnational communities, are instruments of mobilization that allow group grievances to be channeled into violent activity.

Minority economic discrimination – which usually involves some combination of employment discrimination, unequal access to government health, educational or social services, formal or informal housing segregation, and lack of economic opportunities available to the rest of society – is a catalyst for the development of minority group grievances, which are directed against the state, economic status quo, mainstream society, and the majority population. Discrimination also reinforces social exclusion and the previously described sense of otherness among afflicted minority group members. This leaves aggrieved minority populations alienated from the mainstream economic system, distrustful of state institutions and authority and, thereby, more susceptible to radicalization and fertile ground for terrorist movements to recruit cadres, raise money, and plan and execute attacks. Qualitative case studies of Northern Ireland (O'Hearn, 1987) and Latin America (Cleary, 2000) and survey research in Western Europe (Klausen, 2005) identify minority group experience of discrimination as a root source of minority community radicalization that is exploited by extremist movements and terrorist organizations. Terrorist groups are crucial to the process here because, much like social movements or political organizations, they function as vehicles to organize and to channel minority group grievance into violent action. In this way, they are agents of mobilization, overcoming collective action barriers that impair the larger aggrieved minority community from acting upon their disaffection (Sandler, 2003). Discrimination also has an effect on the 'target side' of the relationship. States with aggrieved minority populations can find their counter-terrorism efforts hampered. Aggrieved communities are less likely to be cooperative with state counter-terrorism officials, affording advantages to terrorist groups in their midst (Walsh & Piazza, 2010).

The relationship between discrimination and terrorism can also work the other way. Societies with minority groups that do not face active economic discrimination, or where the legacy of minority discrimination is addressed through remediation policies that level differences between minority and majority populations, demonstrate that they can successfully integrate minorities into mainstream life. Minority communities in non-discriminatory societies are less likely to be radicalized or to be alienated from mainstream society, thereby making the terrorist group agenda less popular and stymieing terrorist group recruitment. In his qualitative study of counter-terrorism responses in Northern Ireland, the Spanish Basque region, Italy against the Red Brigades, Uruguay against the Tupamaros, and Cyprus against EOKA, Hewitt (1984) credits the poor economic status of specific groups within the population, instead of the overall economic climate, as a crucial element in fueling terrorist group recruitment and activities. In assessing the efficacy of counter-terrorism tools, Hewitt credits proactive economic affirmative action for marginalized groups, for example education and housing subsidies of Catholics in Northern Ireland, with reducing the threat of terrorism. Minority communities that are not aggrieved are also more likely to cooperate with state counter-terrorism officials. The qualitative counter-insurgency literature, recognizes this, noting that fostering a sense of mainstream system legitimacy in the face of insurgent efforts to paint the status quo as illegitimate is crucial to securing community cooperation with security efforts (Hashim, 2006; Joes, 2004).

Measurement issues round out the expectation that discrimination in particular is a key predictor of domestic terrorism in countries and can help to explain the link between poverty and terrorism. A handful of scholars actually note, in asides, the problems posed by using indicators that measure nationwide socio-economic or political statuses alone to predict the behavior of terrorist movements, which are small, narrow subnational entities that typically operate within particular and limited geographic regions and social spaces of a country. Li extrapolates from the findings in Fearon & Laitin's (2003) study on the predictors of civil wars to depict terrorist groups as 'extremely marginal political actors' whose grievances are too narrow to be affected by mainstream political or social processes like democratic regime type or level of economic development (Li, 2005: 283). Looking outside of terrorism studies, Sambanis (2004) determines that while they are robust predictors of which countries experience internal armed conflicts, aggregate country-level economic indicators are of little use in explaining which subgroups of citizens are likely to engage in political violence, making it very difficult to assess the different opportunity costs for joining armed rebellions among different strata of country residents. All of this highlights the value in examining more focused indicators, such as whether or not government policies or social conditions alienate subgroups from mainstream economic activity.

Hypotheses

I draw from my theoretical discussion three points that lend themselves to empirical evaluation: that minority economic discrimination produces domestic terrorist activity; that absence of or remediation of economic discrimination suffered by minority groups reduces domestic terrorist activity; and that minority economic discrimination is an important explanatory factor for domestic terrorism alongside aggregate measures of economic development. I therefore test six hypotheses, the first two of which are:

> *H1:* Countries with minority groups that experience economic discrimination will experience higher rates of domestic terrorism.
> *H2:* Countries with minority groups that do not experience economic discrimination will experience lower rates of domestic terrorism.

As previously discussed, there are reasons grounded in theoretical reasoning (Crenshaw, 1981; Gurr, 1993; Ross, 1993), case studies of terrorist movements (Bradley, 2006; Buendia, 2005; Cleary, 2000; Ergil, 2000; Klausen, 2005; Laqueur, 1999; O'Hearn, 1987; Van de Voorde, 2005; Whittaker, 2001), and some indirect and trace cross-national empirical studies (Ellina & Moore, 1990; Eubank & Weinberg, 1994; Lai, 2007; Wade & Reiter, 2007) to expect that minority experience of economic discrimination might precipitate domestic terrorism. These first two hypotheses capture these expectations. It also stands to reason that if economic discrimination against minorities precipitates domestic terrorism by enhancing group grievances and motivating organization, then public policies crafted to ameliorate the effects of minority economic discrimination should reduce domestic terrorism. Hewitt (1984) provides some qualitative case evidence that this may be the case. Therefore, I also test the following hypothesis:

> *H3:* Countries that have in place public policies to remediate the effects of ongoing or historical economic discrimination against minorities will experience lower rates of domestic terrorism.

For the next two hypotheses, I retest the proposition that a country's level of economic development affects the probability that it will experience or produce terrorist activity. My expectations about the observed relationship between level of development and terrorism are mixed, given that while some studies find poverty to be a positive predictor of terrorism (Bravo & Dias, 2006; Burgoon, 2006; Li & Schaub, 2004) by aiding terrorist recruitment efforts, increasing public support for extremism, and damaging the legitimacy of the status quo, empirical findings by others (Li, 2009; Blomberg & Hess, 2008b; Blomberg & Rosendorff, 2006; Ross, 1993) suggest that wealthier countries are more likely to be targeted by terrorists because they are endowed with numerous targets, are more likely to developed free media outlets that will cover attacks, and are symbols of the political and economic status quo. Yet others find no significant relationship between level of economic development and terrorism (Krueger, 2007; Piazza, 2006). To address this controversy, I test two hypotheses:

> *H4:* Countries with higher levels of economic development will experience lower rates of domestic terrorism.
> *H5:* Countries with higher levels of economic development will experience higher rates of domestic terrorism.

Finally, motivated by Crenshaw's (1981) and Ross's (1993) discussions of permissive and precipitating root causes of terrorism, and by observations by Li (2005)

and Sambanis (2004) pointing out the difficulty in explaining small group activity using national indicators, I expect measurements of minority economic discrimination to have strong and substantive effects on patterns of terrorism in countries vis-à-vis national economic indicators. I therefore test my final hypothesis:

> *H6:* Minority economic discrimination is a robust predictor of domestic terrorism compared to national economic development indicators.

Analysis

To test these hypothesis, I use a set of zero-inflated negative binomial regression models on the incidence of domestic terrorism using a using a country-year database of 172 countries from 1970 to 2006. Owing to missing data for some cases, this yields a range of 2,961 to 3,088 observations, depending on the model. In all models, robust standard errors clustered on country are calculated, and dispersion of observations is held constant. My decision to use zero-inflated negative binomial estimators – rather than ordinary least squares, Poisson or standard negative binomial models – is recommended by several unique features of the dependent variable. First, it is an interval measurement that cannot include negative values. Second, it is highly unevenly distributed across cases and years, resulting in temporal and spatial clustering with observational values that may not, in theory, be independent of one another. Finally, it contains a large number of zero values in country-cases that can be divided into two types: non-certain-zero types for countries that retain some probability of experiencing terrorist attacks in other observations; and certain-zero types for countries that due to their nature do not experience terrorism at all (Brandt et al., 2000; Cameron & Trivedi, 1998; King, 1988). These elements – overdispersion and the possibility of two 'types' of zero-values for the dependent variable – suggest the use of zero-inflated negative binomial techniques. This decision is buttressed by Vuong tests, included in the results, and goodness of fit tests, published in the appendix, that recommend zero-inflated negative binomial estimations rather than negative binomial or Poisson tests. I do, however, produce negative binomial and Poisson tests to check the robustness of the published, zero-inflated negative binomial estimations and find them to mirror the core results.[3] I am therefore confident that the findings of the analysis are not dependent on my selection of the estimation technique.

Dependent variable

The dependent variable used in the study is a country-year count of domestic terrorist attacks derived from a dataset developed by Enders, Sandler & Gaibulloev (2011). I opt to model domestic, rather than international, terrorism because the literature I use to construct my theoretical link between discrimination and terrorism – Gurr's (1993) relative deprivation model and Crenshaw's (1981) and Ross's (1993) group grievance models – presumes political violence is directed locally, is motivated by local conditions and involves local actors. Empirical testing bears this out as well: identical regression models run on international terrorist attacks do not demonstrate minority economic discrimination, or absence or remediation of it, to be significant.[4]

Enders, Sandler & Gaibulloev (2011) derive their count of domestic terrorist attacks occurring within countries by separating domestic from international terrorist events published in the widely used Global Terrorism Database (GTD), a publicly available, open-source event-count database of aggregated domestic and international terrorist attacks from 1970 to 2008 built and managed by the National Consortium for the Study of Terrorism and Responses to Terrorism, housed at the University of Maryland.[5] Enders, Sandler & Gaibulloev undertake several steps to separate domestic and international attacks in GTD and to clean the data. They first purge the sum total of 82,536 events in GTD of doubtful or mischaracterized attacks, eliminating approximately 16,000 incidents. They then use five criteria on the remaining events to sort domestic attacks – defined

[3] See Appendix at http://www.prio.no/jpr/datasets.

[4] See Appendix. Results produced using ITERATE (International Terrorism: Attributes of Terrorist Events) database published by Mickolus et al. (2009).

[5] Access to the raw GTD database, along with descriptions of count methods and operationalization of terrorism, is available online at: http://www.start.umd.edu/gtd/. I wish to thank Walt Enders, Todd Sandler, and Khusrav Gaibulloev for allowing me to use their decomposed GTD database. GTD allows users to stipulate operational definition criteria for the inclusion of an event. The Enders, Sandler & Gaibulloev (2011) decomposed terrorism dataset applies the following three criteria: For an act to be included as a terrorist event in the dataset, it must 'be aimed at a political, economic, religious or social goal' [Criterion I] while intending to 'coerce, intimidate or convey some other message to a larger audience' [Criterion II] while also 'including attacks against civilians but excluding attacks against military targets' [Criterion III] (Global Terrorism Database, 2009: 5).

as incidents where the attack country venue matches the nationality of the perpetrators, excluding attacks on local diplomatic targets or hostage situations involving multiple nationalities of victims – from international attacks. Enders, Sandler & Gaibulloev furthermore aid their domestic–international decomposition technique by comparing the GTD international events with the international terrorist events published in the ITERATE database (International Terrorism: Attributes of Events) by Mickolus et al. (2009) and making adjustments. The GTD dataset has noteworthy idiosyncrasies. For example, it used different coding procedures before 1998, and according to Enders, Sandler & Gaibulloev (2011), GTD under-counted transnational terrorist events prior to 1977 and over-counted events from 1991 to 1997. They assume that the domestic and international events they separate from GTD are plagued with analogous measurement errors, and so they adjust *both* of them to the baseline ITERATE data. This produces a reasonably accurate count of domestic and international GTD terrorist events

To produce the dependent variable I use in the study, I aggregate the Enders, Sandler & Gaibulloev (2011) non-calibrated count of domestic terrorist incidents into country-year units for the period 1970 to 2006. Multiple elements recommend a focus on domestic versus international terrorism. First, a study of predictors of domestic terrorism stands to explain a more pervasive threat to security within countries. Abadie (2006) notes that while international terrorist attacks may generate more media attention, domestic terrorism is a far more frequent occurrence and accounts for the lion's share of all terrorist activity in countries. Second, one can expect the impact of minority economic discrimination on terrorist activity to be primarily manifested in domestic terrorism. Though Enders, Sandler & Gaibulloev (2011) note that it is not unheard of for terrorist groups motivated by domestic grievances and local concerns to undertake international attacks to draw wider attention to their goals – in the way that the FLN (National Liberation Front) of Algeria and the Palestine Liberation Organization attacked international targets to highlight their national liberation struggles – this is the exception to the rule. International attacks against third-country targets are harder to justify to constituent audiences for terrorists with domestic grievances, are more likely to invite third-party intervention, and are beyond the organizational and financial capacities of most local terrorist groups. For groups that have struck internationally to draw attention to their cause, international attacks remain rare events over the course of the operational life of the group, dwarfed in frequency by domestic attacks that directly target local assets.[6]

Minority economic discrimination variables

To operationalize minority economic discrimination and policies to remediate discrimination in countries, I construct a set of country-year dummy variables using the 'ECDIS/Economic Discrimination Index' variable published by the Minorities at Risk Project (2009), housed at the Center for International Development and Conflict Management at the University of Maryland.[7] The ECDIS variable measures the degree to which members of groups designated as 'minorities at risk' (MARs) – ethnopolitical communities in countries that 'collectively suffer or benefit from systematic discriminatory treatment vis-à-vis other groups in society' (Minorities at Risk Project, 2009: 1) – face economic discrimination as a result of formal or informal governmental neglect, lack of opportunities or social exclusion, and whether or not they are afforded affirmative remediation. ECDIS is coded in the Minorities at Risk database as a five-point categorical measure coded in the following manner: 0 for countries exhibiting no discrimination against minorities or for countries lacking a minority at risk group; 1 for countries where minority groups suffer from poverty, high unemployment and underemployment because of 'historical marginality, neglect or restrictions' but where government policies are in place to remediate their status; 2 for countries where minority groups face discrimination without remedial government policies; 3 for countries where economic discrimination is due to current and ongoing social practices by dominant groups and where government policies either fail to remediate or are lacking; and 4 for countries where both prevailing social practices and government policy conspire to restrict the economic wellbeing of the group (Minorities at Risk Project, 2009: 11).

The Minorities at Risk project reports data for all possible minority groups in a country and reports data by group. Most countries in the data – 123 out of 176, or 71%, constituting 66.2% of the total observations in the study – contain at least one designated minority at risk group, and the distribution of both

[6] For example, using (non-GTD) data from Piazza (2009) it is evident that terrorist groups motivated by regime or policy change objectives, which are assumed to be local rather than international concerns, very rarely commit international attacks: only 2.1% of attacks from these types of groups were launched against non co-nationals for the period 1998 to 2006.

[7] Data and codebook for the Minorities at Risk project can be found at: http://www.cidcm.umd.edu/mar/data.asp.

MAR groups and experience of minority economic discrimination does not appear to be disproportionately featured in countries with low, or high, levels of economic development.[8] To derive the dummy variables I use in this study, I reshaped ECDIS into a country-year indicator and used a method employed by Lai (2007) and Caprioli & Trumbore (2003) whereby the highest measurement of discrimination across minority groups, if a country contains more than one, is recorded. Observations for countries containing no minorities at risk groups are also included in the analysis. I then constructed new dummy variables for each basic status that ECDIS has: 'minority economic discrimination', coded 1 for country-years indicating the presence of at least one Minority at Risk group and where ECDIS has a value of 2, 3 or 4; 'MARs present but no minority economic discrimination', coded 1 for country-years containing at least one Minority at Risk group but where ECDIS has a value of zero, indicating that minorities do not suffer from economic discrimination; 'Remediation policy for minority economic discrimination', coded 1 for country-years containing at least one Minority at Risk group but where ECDIS has a value of 1, indicating that minorities either experience or have a legacy of economic discrimination but where policies have been put into place to correct the effects discrimination; and finally a dummy variable titled 'No minorities at risk present', which is simply coded 1 for observations in countries where MAR groups are absent. It is also reasonable that the effects of changes in minority group status on patterns of domestic terrorism might take time to register, so I also lag all of these MAR dummies by one period.

Indicators of economic development

I use several independent variables to model the effects of level of macroeconomic development on terrorist incidents. Both are highly conventional (Nafziger, 2006) and have been used to model terrorist activity in previous studies.[9] The first is the natural log of gross national income per capita, a commonly used indicator of a country's level of economic development, held at constant 2000 US dollars. Noting that gross national income measures only accumulation and consumption of wealth in a country as opposed to the impact of wealth on quality of life or income inequality, I also include Human Development Index (HDI) country measures. HDI is published by the United Nations Development Program, and it combines measurements of gross national product per capita, literacy rates, and life expectancy rates into a single indicator intended to measure the standard of living that residents of a country enjoy. In the case of HDI, and also the Gini coefficient discussed as a covariate below, I impute values for years in which data are missing – both HDI and Gini are published less frequently than once a year for some countries in the analysis – by just inserting the most recent value. Like the minority economic discrimination variables, the economic development independent variables are also lagged one period in the models.

Controls

In addition, I include in all models a host of controls that frequently appear in empirical studies of terrorism (Li, 2005; Wade & Reiter, 2007). To operationalize income inequality, I use the same measure used by Abadie (2006), Li (2005), and Li & Schaub (2004): national Gini coefficients. Derin-Güre (2009) found some evidence that countries marked by high income inequality experienced more terrorism, so I expect Gini to be a positive predictor of domestic terrorism. Eyerman (1998) argues that countries with large surface areas and large populations have higher policing costs and are therefore more likely to experience terrorism. I therefore include, in all models, natural logs of national population and geographic area of all countries in the sample. Eyerman (1998) and Li (2005) also find the age of the current political regime to be a negative predictor of terrorism. I therefore control for regime durability, which is calculated as the number of years the current regime has ruled, using data from the Polity IV project (Marshall & Jaggers, 2009). Finally, I control for political regime type using two variables: (1) political participation, which I measure by combining two individual components used in the Polity IV index that indicate the level of free political participation permitted by regimes – PARREG (regulation of political participation by the state) and PARCOMP (an index of the competitiveness of political participation); and (2) executive constraints, which I measure by averaging the Polity IV index components XRCOMP

[8] There is little to no evidence of correlation between the presence of MAR groups and gross national income ($p = -.185$) or MAR groups and Human Development Index ($p = -.117$) or between minority experience of economic discrimination and gross national income ($p = -.120$) and Human Development Index ($p = -.064$).

[9] Most empirical studies of terrorism use a variant of either gross national product per capita (GNP) or gross national income (GNI) to operationalize overall level of economic development in a country. The human development index (HDI) is a more infrequently used measurement of development in empirical studies, but was found by Bravo & Dias (2006) to be a negative predictor of terrorism in Eurasian countries and to have no significant effect on terrorism by Abadie (2006).

Table I. Summary statistics

Variable	*Obs.*	*Mean*	*St. Dev.*	*Min*	*Max*
Domestic Terrorist Incidents	3,287	8.3	32.9	0	523
Log Gross National Income per cap	3,282	7.5	1.6	3.7	14.1
Human Development Index	3,279	0.676	0.185	0.221	0.956
GINI Coefficient	3,293	42.2	9.2	23.0	84.8
Log Population	3,282	1.9	1.7	–2.8	7.1
Log Area	3,310	11.7	2.2	5.7	16.6
Durable	3,293	23.1	30.4	0	197
Political Participation	3,138	3.2	0.9	0.5	5.0
Executive Constraints	3,293	3.4	1.5	–8	6.0
Minority Economic Discrimination (Minority at Risk Group Present, MAR ECDIS = 2, 3 or 4)	3,310	0.37	0.48	0	1
MARs Present But No Minority Economic Discrimination (Minority at Risk Group Present, MAR ECDIS = 0)	3,310	0.07	0.25	0	1
Remediation Policy for Minority Economic Discrimination (Minority at Risk Group Present, MAR ECDIS = 1)	3,310	0.09	0.29	0	1
No Minorities at Risk Present	4,135	0.46	0.49	0	1

(competitiveness of executive recruitment), XROPEN (the level of openness of the executive recruitment process), and XCONST (the institutional constraints placed on the chief executive of the regime).[10] I expect political participation to be a negative predictor of terrorism and executive constraints to be associated with higher levels of terrorism in countries. All controls are also lagged one period in the models. Summary statistics for all variables used in the analysis are presented in Table I.

Results

For the analysis I run two sets of models, the results of which are published in Tables II and III. In the first set, I separate the three variables measuring various aspects of minority economic discrimination into different models, along with covariates, to determine their effect on incidents of domestic terrorism in isolation from one another. The results of these models are presented in Table II. In the second set of models, the results of which are presented in Table III, I examine the effects on terrorist incidents of having no MAR groups in a country and then include in the same model three out of the four MAR variables – Minority Economic Discrimination, Remediation Policy for Minority Economic Discrimination, and No Minorities at Risk Present – with MARs Present But No Economic Discrimination held out as a reference category. This permits me to see the effects of minority economic discrimination on domestic terrorism in relation to other MAR economic discrimination statuses. Note that for each model reported in Tables II and III, the results of both equations run as part of the zero-inflated negative binomial estimation technique are reported: (1) the count or non-certain-zero results, which model the count of domestic terrorist attacks in countries retaining a probability of experiencing domestic terrorism, thereby constituting the main interpreted results of the study; and (2) the results of the inflated logistical regression or certain-zero equation,[11]

[10] A full discussion of the operationalization of these variables can be found at the Polity website: http://www.systemicpeace.org/polity/polity4.htm. The temptation is to use the aggregate Polity score, but Vreeland (2008) demonstrates that Polity, as well as the also commonly-used Freedom House measures of political freedom and civil liberties, is built using indicators of political violence in addition to measurements of political practices and institutions in countries. This would theoretically create difficulties in interpreting results, so he recommends individual participation (PARREG) and executive constraints (XCONST) instead of the aggregate score.

[11] Adhering to convention, the zero-inflated negative binomial model results published in Tables II and III include the same covariates in the inflated, certain-zero equations as are in the count equations. However, Drakos & Gofas (2006), in their piece on underreporting bias in quantitative studies of terrorism, argue against full specification of the inflated equation in zero-inflated negative modeling and recommend instead including only covariates associated with 'certain-zero' countries: regime type. They assume that certain-zero countries appear to be so in the data because they lack free media that would report on terrorist events. As a robustness check, I fitted a set of zero-inflated models that include only the two regime-type indicators in the certain-zero equations – political participation and executive constraints – and found these to produce the same results as the main published models. Results of these models are published in the Appendix.

Table II. Zero-inflated negative binomial regression models for MAR economic discrimination and domestic terrorism, 1970–2006

	(1)	(2)	(3)	(4)	(5)	(6)
Count Model (non-certain zero)						
Minority Economic Discrimination	1.301 (.221)***	1.192 (.221)***				
MARs Present But No Minority Economic Discrim.			−.539 (.312)*	−.653 (.299)*		
Remediation Policies for Econ. Discrim.					−.593 (.266)*	−.352 (.286)
Log Gross National Income per-cap	.298 (.087)**		.354 (.103)**		.376 (.102)***	
Human Development Index		2.518 (.706)**		3.583 (.745)***		3.459 (.791)***
GINI Coefficient	.059 (.013)***	.070 (.014)***	.076 (.019)***	.088 (.018)***	.087 (.020)***	.099 (.019)***
Log Population	1.063 (.095)***	1.056 (.088)***	1.110 (.124)***	1.095 (.113)***	1.191 (.111)***	1.189 (.104)***
Log Area	−.436 (.100)***	−.433 (.098)***	−.485 (.122)***	−.479 (.115)***	−.506 (.118)***	−.508 (.115)***
Durable (Regime Age)	−.006 (.003)*	−.004 (.003)	−.006 (.004)*	−.005 (.003)	−.007 (.003)*	−.005 (.003)
Political Participation	−.285 (.135)*	−.225 (.137)	−.269 (.169)	−.195 (.167)	−.252 (.170)	−.179 (.167)
Executive Constraints	−.176 (.052)**	−.177 (.054)***	−.146 (.049)**	−.174 (.045)***	−.140 (.054)*	−.147 (.056)**
Constant	.487 (1.319)	.361 (1.352)	.743 (1.554)	.274 (1.485)	.054 (1.602)	−.259 (1.612)
Inflated Logit (certain zero)						
Minority Economic Discrimination	−4.330 (1.563)**	−3.694 (.987)***				
No Minority Economic Discrimination			−14.85 (1.50)***	−15.97 (2.06)***		
Remediation Policies for Econ. Discrim.					.602 (1.089)	.793 (1.219)
Log Gross National Income per-cap	.615 (.417)		.309 (.208)		.374 (.270)	
Human Development Index		−2.017 (3.755)		4.266 (2.760)		2.757 (3.816)
GINI Coefficient	.101 (.049)*	.053 (.047)	.018 (.036)	.022 (.036)	.076 (.049)	.085 (.064)
Log Population	−.354 (.506)	−.179 (.591)*	−.757 (.271)**	−.700 (.265)**	−.639 (.359)*	−.641 (.357)*
Log Area	−1.363 (.557)*	−1.388 (.568)*	−.276 (.245)	−.269 (.204)	−.399 (.315)	−.467 (.351)
Durable (Regime Age)	.052 (.020)**	.056 (.020)**	.008 (.006)	.008 (.006)	.012 (.010)	.016 (.010)
Political Participation	−.465 (.489)	−.192 (.351)	−.024 (.286)	.008 (.268)	.143 (.369)	.189 (.313)
Executive Constraints	−.388 (.184)*	−.257 (.124)*	−.222 (.089)*	−.328 (.138)*	−.109 (.129)	−.103 (.150)
Constant	3.880 (5.773)	11.450 (6.109)*	.404 (3.454)	−.105 (3.093)	−3.009 (3.925)	−2.108 (6.193)
Observations	2,964	2,964	2,964	2,957	2,964	2,957
Nonzero Observations	1,170	1,170	1,170	1,169	1,170	1,169
Zero Observations	1,794	1,794	1,794	1,788	1,794	1,788
Wald χ^2	203.96***	203.96***	140.00***	161.58***	146.13***	170.46***
Vuong z-Test	5.54***	5.24***	5.55***	5.64***	5.61***	5.54***

Independent variables lagged one period. Robust standard errors clustered on country reported in parentheses.
*$p \leq .10$; **$p \leq .01$; ***$p \leq .000$.

Table III. Zero-inflated negative binomial regression models for MAR economic discrimination and domestic terrorism, 1970–2006

	(7)	*(8)*	*(9)*	*(10)*
Count Model (non-certain zero)				
Minority Economic Discrimination			.932 (*.297*)**	1.015 (*.296*)**
Remediation Policies for Econ. Discrim.			.103 (*.352*)	.402 (*.348*)
No Minorities at Risk Groups Present	−1.700 (*.412*)***	−1.525 (*.303*)***	−.923 (.330)**	−.726 (*.329*)*
Log Gross National Income per-cap	.328 (*.195*)*		.277 (*.089*)**	
Human Development Index		2.492 (*.903*)**		2.134 (*.813*)**
GINI Coefficient	.078 (*.020*)***	.084 (*.019*)***	.057 (*.014*)***	.062 (*.015*)***
Log Population	.988 (*.244*)***	.969 (*.144*)***	1.020 (*.108*)***	.987 (*.104*)***
Log Area	−.428 (*.121*)***	−.422 (*.117*)***	−.444 (*.098*)***	−.432 (*.096*)***
Durable (Regime Age)	−.007 (*.007*)	−.004 (*.003*)	−.006 (*.003*)*	−.004 (*.003*)
Political Participation	−.295 (*.151*)*	−.249 (*.148*)*	−.292 (*.135*)*	−.249 (*.137*)*
Executive Constraints	−.090 (*.049*)*	−.103 (*.052*)*	−.149 (*.051*)**	−.148 (*.052*)**
Constant	.525 (*1.579*)	.800 (*1.619*)	1.263 (*1.348*)	1.304 (*1.440*)
Inflated Logit (certain zero)				
Minority Economic Discrimination			3.508 (*4.449*)	2.832 (*2.263*)
Remediation Policies for Econ. Discrim.			7.859 (*4.859*)	6.782 (*3.263*)*
No Minorities at Risk Groups Present	.090 (*2.761*)	.500 (*1.119*)	6.877 (*4.027*)*	5.453 (*2.864*)*
Log Gross National Income per-cap	.088 (*1.239*)		.521 (*.483*)	
Human Development Index		−.947 (*3.837*)		−.429 (*10.555*)
GINI Coefficient	.088 (*.136*)	.062 (*.090*)	.066 (*.077*)	.020 (*.063*)
Log Population	−.695 (*.420*)*	−.616 (*.500*)	−.584 (*.732*)	−.580 (*.773*)
Log Area	−.307 (*.958*)	−.305 (*.513*)	−1.113 (*.669*)*	−.946 (*.719*)
Durable (Regime Age)	.019 (*.011*)*	.020 (*.009*)*	.042 (*.023*)*	.038 (*.042*)
Political Participation	−.177 (*.787*)	−.063 (*.352*)	−.507 (*.754*)	−.275 (*.662*)
Executive Constraints	−.152 (*.199*)	−.134 (*.100*)	−.318 (*.331*)	−.232 (*.308*)
Constant	−1.351 (*6.494*)	.555 (*7.648*)	−2.952 (*10.438*)	2.903 (*9.372*)
Observations	3,669	3,661	2,964	2,957
Nonzero Observations	1,279	1,275	1,170	1,169
Zero Observations	2,393	2,386	1,794	1,788
Wald χ^2	105.32***	140.33***	213.32***	203.80***
Vuong z-Test	3.58***	3.90***	5.54***	5.24***

Independent variables lagged one period. Robust standard errors clustered on country reported in parentheses.
*$p \leq .10$; **$p \leq .01$; ***$p \leq .000$.
Reference category is states with Minority at Risk populations experiencing no discrimination.

which models the absence of terrorist attacks in countries that theoretically should never experience terrorism. Because the count equation models events and the inflated logit models absence of events, the signs of the coefficients of the non-certain-zero and certain-zero equations are frequently opposite, or are not significant.

The main findings revealed in Table II are that minority economic discrimination is a significant predictor of domestic terrorist events in countries and that absence of and remediation of minority economic discrimination are significant negative predictors of domestic terrorism. The results also show that poverty is not a significant predictor of domestic terrorism; on the contrary, countries with higher levels of economic development experience *more* domestic terrorism than do poorer countries. I briefly detail the specifics of the results: Across five of the six models, the three different indicators of minority economic discrimination statuses in the non-certain-zero count equations are significant predictors of domestic terrorism in the expected direction, thereby supporting Hypotheses 1, 2, and, partially, 3, and are robust to the inclusion of often highly significant covariates. In the count equations of Models 1 and 2, presence of minority economic discrimination in countries is a significant, positive predictor of the likelihood that a country will experience domestic terrorism. In the count equations of Models 3 and 4, absence of economic discrimination against minority groups is a significant negative predictor

of domestic terrorism, suggesting that countries that contain minority groups but that do not subject them to systematic economic disadvantages experience less domestic terrorism. Finally, the results of count equations in Models 5 and 6 produce mixed results. In Model 5, remediation policy for minority groups that experience or have experienced economic discrimination is a significant negative predictor of terrorism, but it is not found to be significant in Model 6. More information about remediation of economic discrimination is provided in the next set of models. The results in Table III produce results consistent with those in Table II.

First, Models 7 and 8 show that countries that do not contain MAR groups at all are significantly less likely to experience domestic terrorism. This is consistent with the previous finding that minority economic discrimination is a positive predictor of domestic terrorism, but begs the question of whether or not this relationship is overshadowed by the mere presence of sizeable minority communities in countries, regardless of their economic status. The answer to this question is found in Models 9 and 10. When the three minority economic discrimination variables are placed in the same models, they yield the same results as when they are run by themselves. Minority economic discrimination remains a significant positive predictor of domestic terrorism and is robust to the inclusion of the dummy variable for absence of MAR groups in countries, which itself remains significant and negative. In Models 9 and 10, however, remediation of minority economic discrimination is not significant at all, further eroding support for Hypothesis 3, that affirmative action policies to ameliorate minority economic discrimination are not associated with a reduction in domestic terrorist attacks.

The results of the count equations across all of the models also shed light on the perennial question of the relationship between poverty, economic development, and domestic terrorism. General level of economic development, operationalized by gross national income per capita and the Human Development Index, bears a significant positive relationship with domestic terrorism across all models. This suggests that countries marked by high levels of economic development have a higher probability of experiencing domestic terrorist attacks than do poorer, less-developed countries. This finding supports the fifth hypothesis, and also confirms expectations by Li (2009), Blomberg & Hess (2008b), and Blomberg & Rosendorff (2006) that are consistent with the theoretical discussion by Ross (1993), that 'modernized' countries offer more targets to terrorists and more effective means to plan, coordinate, execute, and claim credit for terrorist attacks.

As previously noted, many of the covariates are also significant, thus increasing the robustness of the core findings. Most of these are significant in the direction expected, given the literature. The Gini coefficient is, as expected, a consistently significant, positive predictor of domestic terrorism in the count models, as is national population. In their respective studies, Eyerman (1998) and Li (2005) found regime age (durable) and political participation to be negative predictors of terrorism, and I mostly find the same. I also find population to be a positive predictor, as expected. The only two surprising findings among the controls is that area and executive constrains are significant negative predictors of terrorism in some of the models, contradicting the findings of previous scholars. I have little in the way of explanation for these unexpected findings and can only note that previous studies have examined the effects of area and executive constraints on international, rather than domestic, terrorism.

Substantive effects

To test the sixth hypothesis – that minority economic discrimination, or remediation of minority economic discrimination, is a robust factor for explaining domestic terrorism vis-à-vis aggregate level of economic development in a country – I calculate and compare the substantive effects of the main independent variables using Monte Carlo simulations. Table IV presents the results of these simulations.

The substantive effects portrayed in Table IV are first difference effects of a unit change of the six main independent variables on incidents of domestic terrorism per year while holding all other covariates to their appropriate levels of measurement. Because of the different levels of measurement of the independent variables themselves – the minority economic discrimination variables are binary categorical measures while the gross national income per capita and the Human Development Index are interval/continuous – I report the effects of standardized unit changes of the independent variables: changes from 0 to 1 for the minority economic discrimination variables and average quartile changes for the economic development indicators. Table IV reveals that the minority economic discrimination variables have as large or larger substantive effects on domestic terrorist attacks as aggregate economic development indicators, thus supporting Hypothesis 6. Countries that feature economic discrimination against minority groups experience

Table IV. Substantive effects, MAR economic discrimination and domestic terrorism, 1970–2006

Variable	*Unit change*	*Effects on domestic terrorism attacks per year*	*[95% Confidence interval]*
Minority Economic Discrimination	0–1	+6.120	[5.153−7.182]
MARs Present But No Minority Econ. Discrim.	0–1	–2.086	[–2.849− –1.209]
Remediation Policies for Econ. Discrim.	0–1	–2.087	[–3.046− –0.947]
No Minorities at Risk Groups Present	0–1	–4.322	[–4.987− –3.709]
Log Gross National Income per-capita	Quartile avg.	+2.083	[1.311−3.005]
Human Development Index	Quartile avg.	+1.596	[1.143−2.110]

First difference substantive effects produced via Monte-Carlo simulations using Clarify (King, Tomz & Wittenberg, 2000).

around six more incidents of domestic terrorism per year, holding all other covariates constant. This is the largest substantive effect on terrorism for all of the predictors tested in the analysis. However, the other indicators of economic discrimination have sizeable effects on domestic terrorism as well. Absence of minority economic discrimination in countries that have minorities at risk groups in their national populations, and policies aimed at remediation of past or ongoing minority economic discrimination reduce domestic terrorist attacks by 2.4 and 2 attacks per year, on average, while absence of any MAR groups in countries reduces terror attacks by 4.3 incidents per year. The effect of a country's overall level of economic development on terrorism is also sizeable, but is not as large as the effect of minority economic discrimination or absence of minority groups. For each quartile increase in the Human Development Index, countries are projected to experience only one and one-half more domestic attack per year. These results provide some empirical substantiation for Hypothesis 6: that minority group economic status is a significant and sizeable factor in predicting which countries will be plagued by domestic terrorism and that its potency as a predictor stands up well against national economic indicators.

Conclusion

There are two main conclusions produced by the study. The first is that discrimination 'matters'. The empirical results show that countries that permit their minority communities to be afflicted by economic discrimination make themselves more vulnerable to domestic terrorism in a substantive way. The second main finding is that while aggregate poverty, or rather affluence, within society does affect the amount of domestic terrorism a country suffers, the overall economic status of a country has a smaller effect on terrorism than does the economic status of a country's minority groups. There are both scholarly and policy implications for these, albeit preliminary, findings. For scholars, these results underscore the potential limitations of relying solely on aggregate country indicators to evaluate which countries are most likely to experience terrorist activity. Rather, it shows that because we are seeking to explain the behavior of small groups representing often marginal subnational constituencies, indicators of the political, economic, social, and cultural status of non-modal, subnational actors are worthy of investigation. One can imagine several ways to apply this to future research on terrorism, but an immediate example might be the re-evaluation of regime-type indicators as predictors of terrorism versus indicators of the status of political rights, or levels of political participation, enjoyed by minority groups within countries.

There are also potential implications for counter-terrorism policy. As noted by Abadie (2006) and Piazza (2008), promotion of national economic development in poor countries and democratic and free market economic reforms in politically and economically illiberal countries as a means to reduce violent radicalism became a prominent feature of US foreign policy under the Bush Administration. Elements of this policy framework remain in place under President Obama (US State Department, 2009), as does the Millennium Challenge Account (MCA), created by President Bush in 2002 in the wake of the 9/11 attacks, which provides bilateral aid to impoverished countries conditioned upon their undertaking broad governance and economic restructuring programs. However, the results of this study suggest that counter-terrorism policymakers would be advised to use more specifically targeted measures to attack the socio-economic roots of terrorism. We may, for example, temper our expectations that raising the US economic assistance budget for developing world countries by 50% from 2004 to 2005, or conditioning aid on reforms that improve fiscal responsibility, control inflation or liberalize trade – all policy components of the Millennium Challenge

Account – will help to reduce the threat of terrorism. Instead, we might integrate other components of MCA, such as equalization of national public health and education expenditures across social groups or strengthening and universalizing the rule of law, which may more directly improve the economic status of minority and/or socially excluded and vulnerable groups – groups that if aggrieved are more likely to engage in terrorism.

Replication data

The web Appendix and all replication materials for this study can be found at: http://www.prio.no/jpr/datasets.

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