

Poverty, Political Freedom, and the Roots of Terrorism

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ABSTRACT

This article provides an empirical investigation of the determinants of terrorism at the country level. In contrast with the previous literature on this subject, which focuses on transnational terrorism only, I use a new measure of terrorism that encompasses both domestic and transnational terrorism. In line with the results of some recent studies, this article shows that terrorist risk is not significantly higher for poorer countries, once the effects of other country-specific characteristics such as the level of political freedom are taken into account. Political freedom is shown to explain terrorism, but it does so in a non-monotonic way: countries in some intermediate range of political freedom are shown to be more prone to terrorism than countries with high levels of political freedom or countries with highly authoritarian regimes. This result suggests that, as experienced recently in Iraq and previously in Spain and Russia, transitions from an authoritarian regime to a democracy may be accompanied by temporary increases in terrorism. Finally, the results suggest that geographic factors are important to sustain terrorist activities.

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I. INTRODUCTION

After the 9/11 attacks, much of the political and media debate on terrorism has focused on prevention policies. The widespread view that poverty creates terrorism has dominated much of this debate (see, for example, Kahn and Weiner, 2002). This is hardly surprising. After all, the notion that poverty generates terrorism is consistent with the results of most of the existing literature on the economics of conflicts. In particular, the results in Alesina et al (1996) suggest that poor economic conditions increase the probability of political coups. Collier and Hoeffler (2004) show that economic variables are powerful predictors of civil war, while political variables have low explanatory power. Miguel, Satyanath, and Sergenti (2004) show that, for a sample of African countries, negative exogenous shocks in economic growth increase the likelihood of civil conflict. Because terrorism is a manifestation of political conflict, these results seem to indicate that poverty and adverse economic conditions may play an important role explaining terrorism.

However, recent empirical studies have challenged the view that poverty creates terrorism. Using U.S. State Department data on transnational terrorist attacks, Krueger and Laitin (2003) and Piazza (2004) find no evidence suggesting that poverty may generate terrorism. In particular, the results in Krueger and Laitin (2003) suggest that among countries with similar levels of civil liberties, poor countries do not generate more terrorism than rich countries. Conversely, among countries with similar levels of civil liberties, richer countries seem to be preferred targets for transnational terrorist attacks.¹

While the results in Krueger and Laitin (2003) and Piazza (2004) are extremely suggestive, these studies may suffer, in principle, from some potential shortcomings. First of all, the U.S. State Department data covers only events of international terrorism, that is, those that involve citizens or property of more than one country. However, international terrorism represents only a small fraction of terrorist activity. For example, for the year 2003, the MIPT Terrorism Knowledge Base reports 1,536 events of domestic terrorism,

¹In addition, for the Israeli-Palestinian conflict Krueger and Malečková (2003) show that participants in politically motivated violence tend to originate, if anywhere, from relatively affluent sectors of the population.

but only 240 events of international terrorism.² The difference between reported domestic and international terrorist events in the MIPT Terrorism Knowledge Base is large, in spite of the probable fact that international terrorist incidents tend to have more visibility. While it is clearly interesting to elucidate the impact of potential policy interventions on the level of international terrorism, the effects of such policies on the overall amount of terrorism, both domestic and of foreign origin is of obvious importance too. However, the identity of the determinants of international terrorism is not necessarily informative about the identity of the determinants of domestic terrorism. Much of modern-day transnational terrorism seems to generate from grievances against rich countries. In addition, in some cases terrorist groups may decide to attack property or nationals of rich countries in order to gain international publicity. As a result, transnational terrorism may predominantly affect rich countries. The same is not necessarily true for domestic terrorism.³ Second, the adequacy of the U.S. State Department data to measure terrorism has been recently under attack. Krueger and Laitin (2004) have questioned the quality of this dataset on the basis of the ambiguity of the definitions used for the variables in the dataset and the lack of transparency of the process through which this dataset is assembled.⁴ Finally, because terrorism may in turn affect economic prosperity (see, e.g., Abadie and Gardeazabal, 2003; Frey, Luechinger and Stutzer, 2004; Sandler and Enders, 2005) the observed correlation between terrorism and national income cannot be interpreted as a measure of the magnitude of the effect of economic variables on terrorism. Because terrorism adversely affects economic prosperity, ordinary regression estimates of the effect of economic development on terrorism are biased downwards. Therefore, the estimates in Krueger and Laitin (2003) and Piazza (2004) can be interpreted as a lower bound on the effect of economic prosperity on terrorism. The magnitude of that effect is not identified in an ordinary regression.⁵

²See MIPT Terrorism Knowledge Base, 2004.

³Sandler (2003) describes the differences in terms of motivation and targets between international and domestic terrorism.

⁴Subsequently, Secretary Powell admitted errors and omissions in the construction of the State Department terrorism data. See Eggen (2004).

⁵See also Alesina et al (1996) for a discussion and treatment of the problem of simultaneous causation between economic growth and political instability.

As in the Krueger and Laitin (2003) and Piazza (2003) articles mentioned above, most studies on the causes and effects of terrorism have relied on measures of terrorist casualties or terrorist incidents as proxies for the level of terrorist risk. Frey (2004) and others have recently questioned the quality and adequacy of the available data on terrorist casualties and incidents. In this article, I use a new dataset on the intensity of country-level terrorist risk to study the linkages between terrorism and economic and political variables. The measure of terrorism intensity used in this article comes from country-level ratings on terrorist risk from an international risk rating agency. Risk ratings are used by international investors to evaluate specific types of country risks. Terrorist risk ratings have obvious limitations. They provide only a summary measure of an intrinsically complex phenomenon. However, they have the advantage of reflecting directly the total amount of terrorist risk for every country in the world. To my knowledge, this article represents the first attempt to measure the determinants of terrorism using risk rating data.

The analysis of risk rating data presented in this article validates the findings in Krueger and Laitin (2003) and Piazza (2004) and produces a number of new results. The empirical results reported below show that terrorist risk is not significantly higher for poorer countries, once the effects of other country-specific characteristics such as the level of political freedom are taken into account. In contrast with the results for civil wars in Collier and Hoeffler (2004), lack of political freedom is shown to explain terrorism, and it does so in a non-monotonic way. Countries with intermediate levels of political freedom are shown to be more prone to terrorism than countries with high levels of political freedom or countries with highly authoritarian regimes. This result suggests that, as experienced recently in Iraq and previously in Spain and Russia, transitions from an authoritarian regime to a democracy may be accompanied by temporary increases in terrorism.⁶ Finally, the results of this article suggest that geographic factors may be important to sustain terrorism. In particular, variables which measure average elevation, tropical weather, and country area

⁶In Spain, for example, the number of deaths caused by terrorism increased sharply in the late 1970's, with the beginning of the democratic transition, and decreased gradually afterwards. See Abadie and Gardeazabal (2003).

are powerful predictors of terrorism. The results obtained using ordinary regression become even sharper when instrumental variables methods are used to correct for reverse causation.

The rest of the article is structured as follows. Section II describes the data. The results of the empirical analysis are reported in Section III. Section IV summarizes the main conclusions of the article.

II. DATA

Table I contains definitions of the variables in the dataset and descriptive statistics. The measure of terrorist risk that I use in this article is the World Market Research Center's Global Terrorism Index (WMRC-GTI). The WMRC-GTI seems to be the first attempt to measure globally the risk from terrorist attacks at a country level. The WMRC-GTI assesses the risk of terrorism in 186 countries and against these countries' interests abroad for the period 2003/4. The WMRC-GTI encompasses five factors forecasting motivation, presence, scale, efficacy and prevention of terrorism. The potential range of the WMRC-GTI is 1-100 with higher values representing higher exposure to terrorism.⁷

To measure poverty I use data on country GDP per capita, which comes from World Bank (2004a). In some regressions, instead of GDP per capita, I use the United Nations Human Development Index or the country Gini Index. The Human Development Index measures the well-being of the inhabitants of a country along three different dimensions: health, education, and income. It is constructed using country data on life expectancy at birth, adult literacy and school enrollment ratio, and GDP per capita. The Human Development Index has a 0-1 potential range. The Gini Index is a widely-used measure of income or consumption inequality. The potential range of the Gini Index is 0-100, a value of zero meaning perfect equality. Data on the Human Development Index and the Gini Index come from United Nations (2004).

The measure of (absence of) political freedom is the Freedom House's Political Rights Index (Freedom House, 2004). In contrast with Krueger and Laitin (2003), I use a measure of political rights rather than a measure of civil liberties to describe the political climate

⁷See World Market Research Center (2003) for further information.

of a country. The reason is that endogeneity may be a more serious concern for the latter, if countries restrict civil liberties in response to terrorism. However, given that these two variables are highly colinear, the results of the empirical section do not depend on which one is used in the regressions. The Freedom House’s Political Rights Index has a 1-7 range, with high values representing absence of political rights.

Indices for linguistic, ethnic, and religious fractionalization come from Alesina et al (2003). These indices range between zero and one; they reflect the probability that two individuals chosen at random from the same country belong to different linguistic, ethnic, or religious groups.

Finally, data on geography and climate come from Gallup, Mellinger, and Sachs (2001). Geographic variables include measures of country land area, average elevation, fraction of the country area in tropical climate, and landlock.

III. EMPIRICAL RESULTS

A. OLS Regressions

In this section, I use country-level data for the period 2003-2004 to estimate the following basic specification.

$$\ln(\text{terrorist risk}) = \alpha + \beta \ln(\text{GDP per capita}) + \mathbf{X}'\boldsymbol{\gamma} + \varepsilon. \quad (1)$$

As explained above, I use the WMRC Global Terrorism Index to measure terrorist risk at the country level. The vector \mathbf{X} includes other potential predictors of terrorism such as measures of political freedom, fractionalization, and country geography and climate.

Table II, in columns (1)-(6), reports Ordinary Least Squares (OLS) estimates of the coefficients in equation (1).⁸ The coefficient on log GDP per capita in column (1) shows that a 1% increase in per capita GDP is associated in the data with a .17% reduction in terrorism, as measured by the WMRC Global Terrorism Index. Columns (2) and (3) show that this negative association decreases but remains significant when the Freedom House’s

⁸Heteroskedasticity-robust standard errors are shown in parentheses. All specifications include regional dummies. See table notes for details.

Index of Political Rights is introduced in the regression. The effect of political freedom on terrorism is significantly non-linear in column (3).

In column (4), I include in the regression measures of linguistic, ethnic, and religious fractionalization. Only the measure of linguistic fractionalization shows a significant association with terrorism: conditional on income, political freedom, and linguistic fractionalization, ethnic and religious fractionalization are not significantly associated with terrorist risk. The association between linguistic fractionalization and terrorism becomes even clearer when the other non-significant fractionalization measures are excluded from the regression in column (5). In columns (4) and (5), where fractionalization indices are included in the regression, the coefficient of log GDP per capita remains negative but it becomes statistically indistinguishable from zero at conventional test levels.

It is well-known that certain geographic characteristics may favor terrorist activities. First of all, areas of difficult access offer safe haven to terrorist groups, facilitate training, and provide funding through other illegal activities, like the production and trafficking of cocaine and opiates. Failure to eradicate terrorism in some areas of the world has often been attributed to geographic barriers, like mountainous terrain (e.g., Afghanistan) or tropical jungle (e.g., Colombia). In addition, large countries tend to generate centrifugal pressures, include disaffected minorities, and accumulate grievances.⁹ To control for the effect of geographic factors on terrorism, I include in column (6) three additional variables in the regression: total country area, average elevation, and proportion of the country area in tropical weather. Because geographic factors are also believed to affect economic development (see, for example Gallup, Sachs, and Mellinger, 1998), it is potentially important to correct for the confounding effect of these variables. Once geographic factors are included in the regression, the coefficient on per capita GDP decreases below its standard error, in absolute value.

To sum up, the regression results in columns (1) to (6) show that after controlling for other country characteristics, including the level of political rights, fractionalization, and

⁹See also Fearon and Laitin (2003) and Collier and Hoeffler (2004) for a discussion of how certain geographic characteristic may favor civil wars.

geography, national income is not significantly associated with terrorism.¹⁰

Columns (7) and (8) report the coefficients for the same regression as in column (6), but this time using the U.N. Human Development Index and the Gini Index, respectively, as explanatory variables instead of log per capita GDP. The results show again that once other country characteristics are included in the regression, human development and inequality do not show a significant correlation with terrorism, at conventional test levels.

B. IV Regressions

The regression results in the previous section describe correlations between terrorism and other country characteristics, such as economic factors. It would be erroneous, however, to interpret those correlations as measures of the effect of economic variables on terrorism. Of course, the reason is that not only economic factors may cause terrorism, but also terrorism may affect economic prosperity.

In this section, I use variation in country income induced by geographic landlock to estimate the effect of country income on terrorism. Landlock (the fraction of a country area distant to sea access) has been shown to predict economic growth (see Gallup, Sachs, and Mellinger, 2001). The identification assumption adopted in this section is that landlock does not cause terrorism directly; that is, landlock is only related to terrorism through its effect on national income. If this assumption holds, variation in national income induced by country landlock can be treated as exogenous and used to assess the effect of an exogenous change in income on terrorism level.

Table III, in columns (1)-(6), reports instrumental variables estimates of the effect of national income on terrorism. Qualitative results remain virtually unchanged relative to

¹⁰Besides the results reported here, I estimated additional specifications which included measures of other potential determinants of terrorism. In particular, following Fearon and Laitin (2003) and Collier and Hoeffler (2004) work on civil conflicts, I included explanatory variables measuring education and the proportion of young males in the population. Collier and Hoeffler (2004) argue that education may affect political attitudes and increase the opportunity cost of political violence. Fearon and Laitin (2003) hypothesize that young males may be particularly apt or inclined to engage in political violence. The specific measures that I employed were the average years of schooling for adults (World Bank, 2004b) and the proportion of males aged 15-24 in the population (United Nations, 2003). None of these variables produced significant coefficients at conventional test levels.

Table II. However, the magnitude of some of the coefficients change considerably. In contrast with the results in Table II, the instrumental variables coefficient on log per capita GDP becomes positive in columns (4)-(6) where the fractionalization and geographic variables are included in the regression. Nevertheless, this coefficient remains non-significant at conventional test levels. In addition, the magnitude of the coefficients on the political freedom variables increases considerably. The results in column (6) show that the effect of political variables is significantly non-linear once the effect of geographic factors is taken into account.¹¹

Figure 1 plots the estimated effect of lack of political rights on terrorism with the other variables evaluated at their means. Over most of the range of the political rights index, lower levels of political rights are associated with higher levels of terrorism. However, highly authoritarian countries (political rights index equal to 7) experience lower terrorist risk than countries in some intermediate range of political rights (political rights index equal to 4-6). The non-monotonic nature of the relationship between political rights and terrorism can be interpreted in different ways. On the one hand, the repressive practices commonly adopted by autocratic regimes to eliminate political dissent may help keeping terrorism at bay.¹² On the other hand, intermediate levels of political freedom are often experienced during times of political transitions, when governments are weak, political instability is elevated, so conditions are favorable for the appearance of terrorism.¹³

As with the OLS regression results in the previous table, column (7) reports the estimated coefficients for a specification that uses the U.N. Human Development Index, instead of per capita income, as an explanatory variable. The U.N. Human Development Index is instrumented also with landlock.¹⁴ Similar to the results in the previous column, the instru-

¹¹Similar to the OLS results, measures of education and of the proportion of young males in the population did not produce significant coefficients.

¹²The country with the lowest value of the WMRC Global Terrorism Index 2003/4 is North Korea, a highly autocratic regime.

¹³See Fearon and Laitin (2003) for a discussion of the same issues in relation to civil wars.

¹⁴Table III does not include a specification with the Gini Index treated as an endogenous explanatory variable. Arguably, country inequality is affected to a lesser extent by reverse causation than per capita GDP or human development. In addition, while landlock is believed to affect per capita income and human development, to my knowledge a similar effect has not been documented for inequality. In fact, while the landlock variable produces decent first stages for per capita income and human development (with first-

mental variables coefficient of the human development index is positive but not statistically different from zero at conventional test levels.

IV. SUMMARY AND CONCLUSIONS

Using a new dataset on terrorist risk worldwide, I fail to find a significant association between terrorism and economic variables such as income once the effect of other country characteristics is taken into account. Instrumental variables estimates, which are used to correct for reverse causation, produce the same qualitative results. The estimates suggest, however, that political freedom has a non-monotonic effect on terrorism. This result is consistent with the observed increase in terrorism for countries in transition from authoritarian regimes to democracies. In addition, the results show that certain geographic characteristics may favor the presence of terrorism.

stage F-statistics on the excluded instrument of 6.47 and 11.39 in columns (6) and (7), respectively), the same is not true for inequality. The first-stage F-statistic on landlock with the Gini Index as the endogenous explanatory variable is just 1.22.

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TABLE I – DESCRIPTIVE STATISTICS

Variable	Definition	Obs.	Mean	S.D.	Min	Max
<i>Terrorism:</i>						
terrorist risk	WMRC Global Terrorism Index 2003/04	186	40.13	19.82	10	94
<i>Economic variables:</i>						
GDP per capita	GDP per capita for 2003 in current USD	156	6971	11541	93	58482
human development index	U.N. Human Development Index, 2002	171	0.70	0.18	0.27	0.96
Gini index	Gini Index on income or consumption, various years	122	40.61	10.17	24.4	70.7
<i>Political freedom:</i>						
lack of political rights	Freedom House's Index of Political Rights, 2003	176	3.5	2.15	1	7
<i>Fractionalization:</i>						
linguistic	Linguistic Fractionalization	174	0.39	0.28	0.002	0.92
ethnic	Ethnic Fractionalization	175	0.45	0.26	0	0.93
religious	Religious Fractionalization	182	0.43	0.23	0.002	0.86
<i>Geography and climate:</i>						
country area	Country area in million square kilometers	161	.8098	2.0262	.0027	16.6
elevation	Average elevation above sea level in hundred meters	161	6.19	5.57	.0917	31.86
tropical area	Fraction of country area in tropical weather	161	0.31	0.41	0	1
landlock	Fraction of country area beyond 100 km of ice-free coast	161	0.64	0.35	0	1

TABLE II – TERRORISM AND COUNTRY CHARACTERISTICS
(OLS with Heteroskedasticity-Robust Standard Errors)

Dependent variable: Natural logarithm of WMRC Global Terrorism Index								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Economic variables:</i>								
log GDP per capita	-.1680** (.0343)	-.1263** (.0410)	-.0948** (.0434)	-.0511 (.0464)	-.0642 (.0448)	-.0400 (.0492)		
human development index							-.0606 (.4523)	
Gini index								-.0076 (.0050)
<i>Political variables:</i>								
lack of political rights		.0563** (.0274)	.2966** (.1073)	.2289** (.1141)	.2469** (.1110)	.1975* (.1136)	.2535** (.1118)	.2330** (.1090)
lack of political rights squared			-.0300** (.0127)	-.0212 (.0133)	-.0236* (.0130)	-.0198 (.0132)	-.0272** (.0130)	-.0262* (.0135)
<i>Fractionalization:</i>								
linguistic				.4207* (.2453)	.5122** (.1741)	.3565* (.1858)	.3164* (.1814)	.4016** (.1879)
ethnic				.2130 (.2531)				
religious				-.1028 (.1655)				
<i>Geography and climate:</i>								
country area						.0449** (.0130)	.0459** (.0121)	.0428** (.01417)
elevation						.0150** (.0060)	.0198** (.0061)	.0208** (.0061)
tropical area (fraction)						.3119** (.1135)	.3063** (.1141)	.3778** (.1256)
<i>R-squared</i>	.21	.24	.27	.32	.32	.37	.33	.43
<i>Number of observations</i>	156	154	154	144	146	136	146	118

Notes: All specifications include an exhaustive set of regional dummies for North America and Western Europe, Latin America and the Caribbean, Middle East and North Africa, Sub-Saharan Africa, Eastern Europe and Central Asia, and Rest of Asia and Pacific. Heteroskedasticity-robust standard errors are shown in parentheses.

* indicates statistical significance at the 10% level.

** indicates statistical significance at the 5% level.

TABLE III – TERRORISM AND COUNTRY CHARACTERISTICS
(IV with Heteroskedasticity-Robust Standard Errors)

Dependent variable: Natural logarithm of WMRC Global Terrorism Index

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Economic variables:</i>							
log GDP per capita	-.2167 (.1518)	-.1372 (.2005)	-.1175 (.2167)	.0633 (.2213)	.0564 (.2125)	.1995 (.1913)	
human development index							1.2714 (1.5889)
<i>Political variables:</i>							
lack of political rights		.0426 (.0660)	.2409 (.2876)	.3881 (.2583)	.4009 (.2637)	.4676** (.2234)	.3937** (.1812)
lack of political rights squared			-.0244 (.0286)	-.0375 (.0258)	-.0393 (.0265)	-.0461** (.0227)	-.0417** (.0196)
<i>Fractionalization:</i>							
linguistic				.5018* (.2605)	.5055** (.2274)	.5148* (.2202)	.3952** (.2012)
ethnic				.0650 (.2385)			
religious				-.0648 (.1970)			
<i>Geography and climate:</i>							
country area						.0333** (.0149)	.0340** (.0142)
elevation						.0216** (.0083)	.0220** (.0064)
tropical area (fraction)						.3460** (.1330)	.2865** (.1194)
<i>Number of observations</i>	141	140	140	135	136	136	146

Notes: Economic variables are treated as endogenous variables and instrumented with landlock. All specifications include an exhaustive set of regional dummies for North America and Western Europe, Latin America and the Caribbean, Middle East and North Africa, Sub-Saharan Africa, Eastern Europe and Central Asia, and Rest of Asia and Pacific. Heteroskedasticity-robust standard errors are shown in parentheses.

* indicates statistical significance at the 10% level.

** indicates statistical significance at the 5% level.

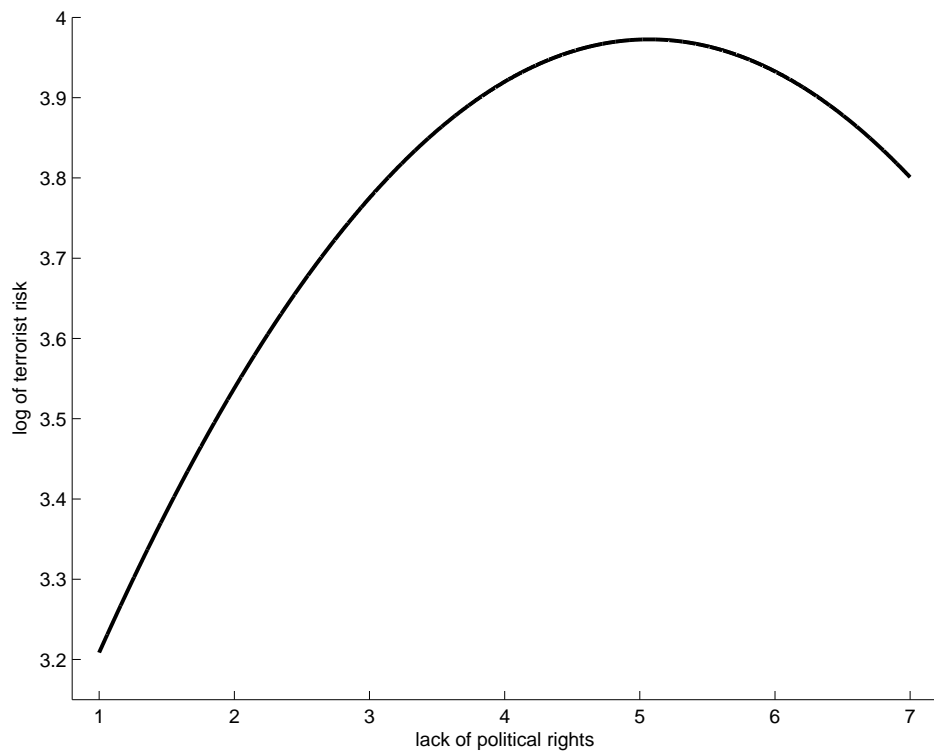


FIGURE 1. TERRORISM AND POLITICAL FREEDOM