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2013

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Available at: https://works.bepress.com/charles_boehmer/10/

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The Curvilinear Effects of Economic Development on Domestic Terrorism

Abstract: This paper investigates the relationship between economic development and domestic terrorism. We argue states at intermediate levels of development go through socioeconomic changes that result when traditional economies are replaced by modern economic relations, which may lead to grievances and social mobilizations conducive to terrorism. The effects of economic development should have a curvilinear effect on domestic terrorism. We test our theory using the GTD dataset and find support for our theory. We show that states at intermediate levels of economic development are more prone to domestic terror attacks than the poorest and richest states. Terror events would appear more likely where states fail to provide, or reduce, an economic safety net to mitigate the transformative effects of economic development. Moreover, the results show that states that are highly democratic, and long-enduring, are less prone to domestic terrorism than less democratic states.

Keywords: terrorism, economic development, democracy, income inequality

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1 Introduction

What is the relationship between economic development and terrorism? Past studies show contradictory effects concerning how development either increases or decreases the occurrence of terrorism. This is unsurprising given the various logical explanations and differences between domestic and transnational terrorism. Moreover, most studies model the effects of development on terrorism as a linear relationship. We instead argue that the effects of development on terrorism are curvilinear, with states at intermediate levels of development being the most prone to acts of terror. Modeling development as a curvilinear relationship explains how seemingly contradictory theoretical expectations may each explain the frequency of terror attacks across levels of development. We test our theory using the GTD dataset and find support for our theory.

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The literature on terrorism has yielded contradictory evidence of a direct link between poverty, or state income, and terrorism. Studies at the individual level of analysis do not often find direct substantiation that poverty is the key demographic criterion to becoming a terrorist (Krueger and Maleckova 2003; Sageman 2004). Berrebi (2007) shows that in fact higher income individuals were more apt to join Hamas and the Palestinian Islamic Jihad, but Kavanagh (2011) demonstrates an interaction effect between high levels of education and poverty that is conducive to participation in terror groups. However, Mousseau (2011) surveyed individuals in 14 Islamic states and found that urban poverty increases support for terror organizations. Other studies have focused on the income of states and not individuals, but again the findings are mixed. Some studies show that rich states are more likely to become targets of terrorism (Bloomberg and Hess 2008; Bloomberg and Rosendorf 2009), possibly because higher income states possess more attractive targets to attack (Ross 1993; Sandler 1995). Piazza (2011) found economic discrimination against minorities to be an important cause of domestic terrorism, particularly when economic remediation is unavailable. His examination also shows that states with high income inequality and high levels of GDP per capita are also positively related to terrorism. Other studies find no significant relationships between state level development or poverty and terrorism or find that poor states do not have higher levels of terrorism than high or middle income states (Abadie 2006; Dreher and Gassebner 2008; Krueger and Laitin 2007; Piazza 2006). In contrast, Derin-Güre (2009) examines both domestic and transnational terrorism and finds that as states develop, they become less apt to produce transnational terrorists, experience less domestic terrorism, and are decreasingly targeted by transnational terrorists. High income inequality has been linked to terrorism by some studies (Lai 2007; Piazza 2011), although higher levels of income appear to reduce terrorism when states spend on social welfare, or high economic development otherwise leads to more economic opportunities through globalization (Bravo and Dias 2006; Burgoon 2006; Krieger and Meierrieks 2010; Li 2005; Li and Schaub 2004). Given that the literature on development and terrorism has produced mixed findings, a few studies have investigated the possibility of curvilinear effects on terrorism. Both Daube (2011) and Enders and Hoover (2012) show that middle income states are more prone to both domestic and transnational terrorism than high and low income states.

In contrast to previous studies, we predict that the highest levels of state economic development decrease the frequency of domestic terror attacks, and that the relationship is nonlinear, where the richest and poorest states are less prone to domestic terror attacks than states at intermediate levels of development. Moreover, because the level of democracy of states tends to covary with economic development, we must disentangle the effects of democracy from



economic development. Once we model the curvilinear effects of both development and democracy, we show that highly democratic states are less prone to domestic terrorism than less democratic states. We examine the relationship between economic development and domestic terror attacks using the Global Terrorism Database (GTD) (LaFree and Dugan 2007; START 2012). We find empirical support for our theory.

2 The theoretical argument

The central supposition of our theory is that economic development leads to socioeconomic changes (Kuznets 1955; Olson 1963; Rostow 1960), which disrupt traditional socioeconomic patterns and create preconditions (Crenshaw 1981) for domestic terrorism. Economic development may also affect the percipient conditions for terrorism, such as economic discrimination against a backdrop of economic insecurity. The literature draws various links between economic insecurity, deprivation, and discrimination, which may motivate class, religious and ethnic minority grievances, increasing the risk of terrorism. We borrow Mousseau's theory (2002–2003) explaining that terrorism is related to shifts from traditional clientalist to market-based economies, becoming mixed economies that alter social relations, which could generate political grievances.¹ Some states possess the attributes of both types of systems as mixed economies, which Mousseau argues motivates grievances that can lead to terrorism. This transition in the nature of economies appears to be related to the Kuznets curve between development and income inequality, although we do not believe income inequality is the only cause of terrorism, especially given that economic conditions may exacerbate political conflicts, as often shown in Piazza's work. We do not argue that poor individuals are most motivated to become terrorists, but rather that economic conditions in a society become amplified by a state's attainment of an intermediate level of development. Modern economies often lead to a clash between secular and sectarian modes of life (such as in Turkey and the Middle East), or can lead to other cultural changes that alter the social fabric of a society. Socioeconomic inequalities and other problems such as unemployment emerge

¹ Clientalist economies are based on social hierarchies that include gift-giving reciprocity often linked to accumulating surpluses of influence by obtaining obligations from others, often related to patronage systems. The economies of such systems are in-ward looking and the enforcement of norms and rules occur through in-groups. In contrast, market economies rely on contract law and equality among economic atomistic actors, which challenges traditional norms and the in-groups of social hierarchies.

(especially when accompanied by urbanization) that political entrepreneurs act on to mobilize violence against their government and others in society. The disruptions of clientalist economies should increase terrorism for middle income states, especially when faced with deprivation or economic insecurity. However, higher levels of state wealth allow for the provision of economic safety nets to minimize the threat of terrorism, which decreases economic grievances by providing for an expansion of public goods to co-opt those who might turn to violence (Burgoon 2006; Krieger and Meierrieks 2010). Some of the same economic problems exist for both middle and high income states, but the latter can better afford to ameliorate such problems through social spending. Moreover, higher levels of wealth often provide the richest states with more effective means to prevent civil strife and conduct counterterrorism, even if development provides more targets. However, developed states will still see some level of terrorist activity due to post-industrial issues such as animal rights, abortion, environmentalism, or other motives that can spark violent acts, but we expect that the number of terror incidents caused by post-industrial issues will be lower than in states that are in the middle of a developmental transition because there will be fewer economic issues to motivate grievances, and those that do arise will be less serious to the population as a whole. Given the frequency of terrorism in states at intermediate levels of development, modeling this relationship as a linear form will likely yield the result that increasing development increases terrorism.

3 The research design

We examine 144 states from 1970 to 2000 using a cross-sectional time series dataset.² The unit of analysis is the state-year. We use the Global Terrorism Dataset to create a count variable of domestic terror attacks per year. Table 1 includes our variables.³ To capture the curvilinear effects of development and democracy, we include a nonlinear and a squared term, respectively. We use negative binomial

2 The data matrix is based partly on Li (2005), which truncated the time frame, and also included the ITERATE data to study both domestic (GTD) and ITERATE data. This project began with the idea of nesting our work in Li (2005) to examine the different effects of development on democracy and transnational terrorism. Our domestic attacks count variable comes from Daube (2011), which was created around the same time that the Enders, Sandler, and Gaibullov (2011) data became available.

3 Please contact the author for variable data sources and coding. In an earlier version of this paper, we also verified that economic development affects income inequality, and that income inequality positively affects domestic terrorist incidents. This aspect of the project is being developed in a separate paper.

Table 1 Variable summary statistics.

Variable	Obs	Mean	Std. dev.	Min	Max
Terror incidents	5061	11.495	46.64	0	778
Development	3596	8.316	1.039	6.05	10.69
Development squared	3596	−0.610	17.255	−34.23	43.48
Democracy	3967	10.820	7.779	1	21
Democracy squared	3967	−5.179	183.10	−181.8	258.2
Durable	4056	2.542	1.287	0	4.61
Population logged	4617	15.680	1.749	10.84	20.96
Capability	4435	0.007	0.022	0.00	0.21
Economic growth	4076	3.670	4.621	−20.27	81.62

regression to examine the terrorism models, using robust standard errors clustered by country codes.

4 Empirical findings

Table 2 provides the results of our estimates of the models testing for relationships between economic development and terrorist attacks. The estimates for model 1 yields the finding that the linear effect of development on domestic terrorism is positive and significant, as found in some prior studies, and as we expect given the increase of terrorism that occurs for middle income states. However, the results for models 2 and 3 show that the relationship between development and domestic terrorism is curvilinear, roughly reflecting an inverted U-shape distribution. The development terms in these models are statistically significant. Figure 1 shows how the expected number of terror incidents for a state is a nonlinear effect of development (based on the estimates of model 3). The poorest states of the international system have a relatively low number of terror incidents, but this expected number of attacks increases if states attain more wealth. Beyond intermediate levels of wealth, the risk of terror incidents decreases, which would appear related to higher spending on societal welfare and a reduction of cultural tension that may arise through the developmental process. It is also possible that states are more effective in gathering intelligence and counter-terrorism efforts.

The effects of democracy on terror incidents is important because it is expected that the open and transparent nature of democracies make them ripe environments for terrorism, although this is less the case for regimes that have been durable (Li 2005). Democracy is an important control variable because many

Table 2 The effects of economic development on domestic terror incidents.

Y=Terror incidents	Model 1			Model 2			Model 3		
	Coef.	Std error	Prob.	Coef.	Std error	Prob.	Coef.	Std error	Prob.
Development	0.5124	0.2331	0.0280	10.5507	2.0317	0.0000	9.1467	1.9467	0.0000
Development squared				-0.6174	0.1232	0.0000	-0.5226	0.1186	0.0000
Democracy	0.0488	0.0290	<i>0.0920</i>	0.0632	0.0255	0.0130	0.3618	0.1081	0.0010
Democracy squared							-0.0134	0.0050	0.0070
Durable	-0.3563	0.1276	0.0050	-0.2575	0.1044	0.0140	-0.1695	0.1017	<i>0.0960</i>
Population logged	0.7904	0.1379	0.0000	0.7153	0.1204	0.0000	0.7075	0.1115	0.0000
Capability	-18.039	5.8230	0.0020	-9.1567	5.7521	0.1110	-8.7763	5.5241	0.1120
Economic growth	-0.0497	0.0257	<i>0.0530</i>	-0.0697	0.0261	0.0080	-0.0649	0.0258	0.0120
Constant	-14.133	2.8229	0.0000	-97.381	16.694	0.0000	-89.114	16.047	0.0000
Observations		3130			3130			3130	
Prob> χ^2		0.0000			0.0000			0.0000	

Note: Negative binomial regression with robust standard errors. Values are bolded if ≤ 0.05 P-value, in italics if ≤ 0.10 .

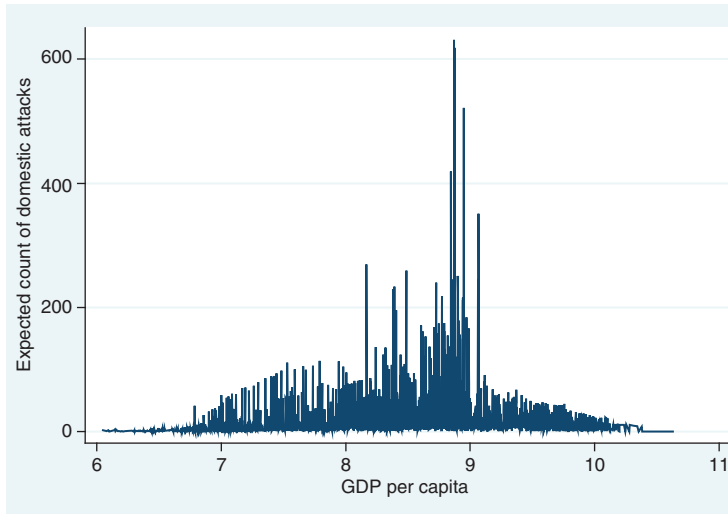


Figure 1 The effects of economic development on domestic terrorism.

rich states are also democratic. Model 1 shows that Democracy is positive but only significant at the 0.10 level, whereas Durable is negative and highly significant (0.005). However, controlling for the curvilinear effect of development, the liner democracy term attains higher significance (0.013), and Durable retains its significance. Model 3 includes the Democracy squared variable to estimate a potentially parabolic relationship, and the squared term is negative and statistically insignificant. This is very important because it shows, contrary to the literature, that it is not democracy per se that makes states likely to experience terrorism, or at least domestic attacks, but instead the stability of the regime (time since last regime change). In fact, higher levels of democracy appear to provide an additional safety valve that reduces domestic attacks of terrorism. This finding is also similar to Abadie's (2006) study showing that political freedom has an inverted U-shape effect on terrorism.

5 Conclusion

We argued and demonstrated that economic development has a curvilinear relationship on domestic terrorism, where the intermediate levels of development experience a higher frequency of incidents than the poorest and richest states of the interstate system. People living in states at different levels of development

likely possess dissimilar types and severities of grievances, which appear related to changes in socioeconomic relationships within societies. This transition to a “mixed” economy produces a dangerous environment that can be improved with further development (likely through social welfare spending), leading to a decrease in the likelihood of terror incidents. We also show that the effects of democracy and regime durability are related and in part a function of the regime transitions of states often having intermediate Polity scores. Once we model development and democracy with nonlinear forms, it is clear that highly democratic states are not more prone to domestic terrorism relative to other states. Stable and highly democratic states likely generate fewer grievances resulting in violence because of the safety valve nature of elections and civil liberties, while at the same time providing higher economic benefits that reduce economic grievances. Rich democracies are especially capable of providing these economic benefits, and such states would appear less likely to discriminate against some factions of society in favor of others.

Still, the results we report should not be interpreted deterministically or teleologically; states that attain high levels of wealth can backslide towards poverty. Indeed, the financial shocks in the global economy since 2008 have led to economic contractions and debt-crises in even the richest states. If states reduce their welfare safety nets, we should see growing income gaps in states despite level of development. An implication of this study is that we should then expect to see increased domestic terrorism in even rich states if they significantly reduce social welfare spending, especially given that the material wealth of the richest in society (including corporate profits) would be visible. Perhaps then we would see some modern equivalent to the Red Brigades of Italy; the rioting and demonstrations in various European states could serve as a predictor for this type of violence unless recent trends reverse.

Acknowledgements: We would like to thank Victor Asal, Taeko Hiroi, Brian Greenhill, Neil Ferguson, Yoram Haftel, Tobias Böhmelt and two anonymous reviewers for comments during the course of this project, and we also thank Quan Li for help with data. All errors herein are the fault of the authors.

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