

# Does Terrorism Have Economic Roots?\*

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## Abstract

This paper investigates the roots of international, domestic, and separatist terrorism using a new, extensive, multi-country panel data set obtained from MIPT (Memorial Institute of Prevention of Terrorism). I augment the MIPT data by recording the target country and the terrorist's country of origin. I also classify each terrorist incident as international, domestic or separatist. International terrorism refers to terrorism committed by foreign nationals. Domestic terrorism refers to terrorism committed by domestic nationals. Separatist terrorism is committed by domestic nationals engaged in separatist causes. Using a panel data analysis with country fixed effects, I find striking results at considerable odds with the literature. Whereas the previous literature finds that terrorism is unrelated to economic conditions, I find that the richer the country, the fewer the terrorist attacks committed abroad by the country's nationals. Similarly, I find that when a country is richer, the country's nationals commit fewer terrorist attacks at home. I build an entirely new data set with regional GDP of separatist regions and find that the higher the GDP of the separatist region, the fewer the terrorist attacks committed by native separatists.

*Keywords:* Economics of Terrorism, Count Data, International Terrorism, Domestic Terrorism, Separatist Terrorism.

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## 1 Introduction

Does economic deprivation lead to terrorism? This question has increasingly been asked in the media and in politics following the September 11, 2001 terrorist attacks. The conventional wisdom among policy makers is that poverty creates terrorism but several empirical studies have challenged this view. Krueger and Maleckova, 2003; Berrebi, 2003; Abadie, 2004; Piazza, 2006; Feldman and Ruffle, 2007; Krueger and Laitin, 2007; Kurrild-Klitgaard et. al., 2006; Dreher and Gassebner, 2007; Testas, 2004 have all found little or no correlation between economic conditions and terrorism. In this paper, I will reassess the evidence on the economic roots of terrorism. I question whether international, domestic, and separatist terrorism have economic causes by using the MIPT (Memorial Institute for Prevention of Terrorism) – a new, extensive, multi-country panel data set.

To my knowledge, this is the first paper that tests the economic roots of international terrorism, as well as domestic terrorism, and categorizes separatist terrorism individually. International terrorism refers to terrorism committed by foreign nationals. Domestic terrorism is terrorism committed by domestic nationals. Separatist terrorism is committed by domestic nationals engaged in separatist causes. This paper uses cross-country and panel data analysis to estimate the effect of economic conditions on targets and origins of international, domestic, and separatist terrorism. The findings are striking, and at considerable odds with the literature.

Several studies have already investigated the economic roots of terrorism. Considering the supply side of terrorism, Berrebi (2003) finds that high standards of living and

educational levels are positively associated with participation in Hamas and Palestinian Islamic Jihad (PIJ) terrorist activities in Israel. Krueger and Maleckova (2003) find that the connection between poverty, education and terrorism is indirect, complicated and probably quite weak. A few studies on international terrorism find that economic development and social welfare policies are important determinants terrorism. (Burgoon, 2006; Li and Schaub, 2004; Li 2005)<sup>1</sup>.

Several cross-country studies has shown that terrorism has no economic roots. Among these studies the most influential ones are Abadie(2004) and Krueger and Laitin(2007). Abadie (2004) shows that terrorist risk is not significantly higher in poor countries when we control for political freedom. The terrorist risk data used by Abadie (2004) includes information on the country of occurrence but not on the target countries and on the countries of origins of terrorism. Therefore the data confounds between different types of terrorism.

Among the cross-country studies, Krueger and Laitin (2007) is the only paper that differentiates between country of occurrence, target country and the terrorist's country of origin. The authors use a US State Department data set on international terrorism and find that a country's economic performance is not a statistically significant predictor of international terrorist attacks committed by that country's nationals. On the other hand, it appears that it is mainly the wealthy countries that are the targets of international terrorism. While the results in Krueger and Laitin (2007) are indicative, this paper suffers from some potential shortcomings. The US State Department data set used in the paper has many deficiencies including the ambiguity of the definitions used for some

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<sup>1</sup>These studies focus on country of occurrence but not the targets or origins of international terrorism. These studies also control for government capacity in the regressions. Krueger and Laitin (2007) mentions that government capacity largely reflects the GDP per capita. Therefore, the sizeable positive impact of government capabilities found by the authors is likely to offset the claimed negative effect of economic development on terrorism.

variables as well as errors and omissions in the data set, acknowledged by the authors themselves. For example Krueger admits that "...these data (US State Department Data) have serious problems, only some of which, as I detail below can be addressed" (Krueger, 2007, pp.66). Moreover, Krueger and Laitin (2007) use only international terrorist incidents. Most of the terrorist incidents, however, are not international but domestic and separatist incidents. My classification of the MIPT data suggests that between 1998 and 2006 only 8 percent of all terrorist incidents are international, but 57 percent and 35 percent of all incidents are domestic and separatist in nature, respectively. Therefore it is essential to study the determinants of domestic and separatist terrorism, as well.<sup>2</sup>

The weaknesses with the data sets used in the previous literature highlight the importance of testing the economic roots of terrorism with an alternative data set. The MIPT data set has not been used in a study of targets and origins of terrorism before.<sup>3</sup> The MIPT data set includes information on the country in which the attack occurred and the terrorist organization responsible for the attack, to the extent that it is known. It includes a small description of the incident, but includes no information on the target country or terrorist's country of origin. I augment the MIPT data by classifying the target country and the terrorist's country of origin for each one of 31,662 terrorist incidents listed in MIPT from 1972 to 2006. I also classify each incident as either international, domestic, or separatist. As the data set includes a longer time horizon than the previous

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<sup>2</sup>Using the US State Department data, Piazza (2006) also finds that economic well-being is not related with the number of terrorist incidents occurred in that country.

<sup>3</sup>Abadie(2004) performs some robustness checks using the MIPT data but the study does not differentiate between targets and origins of terrorism and includes no information on international terrorism versus domestic and separatist incidents. Dreher and Gassebner (2007) uses MIPT data but they do not differentiate between different types of terrorism, as well as target's country and terrorist's country of origin. Feldman and Ruffle(2007) use the MIPT data but they focus on the terrorist organizations carrying out attacks.

data sets, from 1972 to 2006, I will be able to employ econometric techniques that more convincingly isolate country-specific factors that may affect terrorism.

The previous literature on the targets and origins of terrorism focuses on cross-country estimations. I replicate the cross-country estimations with the MIPT data. Using the same sample period and the same set of countries as Krueger and Laitin (2007), I find that international terrorism does not originate from poor countries but targets rich countries. I also find the same results using cross-section estimations between 1998 and 2006.<sup>4</sup> The novelty of the paper is that the larger panel data allows me to perform longitudinal analysis. Panel data also allows me to control for the impact of omitted variables, through the inclusion of country-fixed effects. This is important in the analysis of terrorism as we can think of many other variables that can affect terrorism and for which we were not able to control. Panel data estimations with fixed effects show a substantially different picture. I find that countries that get richer over time export fewer terrorist attacks. At the same time, countries that grow richer over time do not attract more terrorist attacks. This result holds for yearly panel data as well as the panel data that I generate for five-year periods.

Cross-sectional estimations suggest that domestic terrorism does not significantly occur in poor countries. On the other hand, using panel data with country fixed effects I find that countries that get richer over time produce fewer domestic terrorist attacks. Unlike the previous cross-country literature that considers separatist terrorism as a part of domestic terrorism (like the incidents in Turkey and Sri Lanka) or international terrorism (like the incidents in Kashmir and West Bank/ Gaza), I consider them separately as the content and motivation might be quite different from international and domestic

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<sup>4</sup>Cross-country estimations are also performed between 1972 to 2006. I will report the estimation results between 1998 and 2006 for comparison purposes as domestic and separatist terrorism data is available only between 1998 to 2006. The data set may also be more reliable after 1998.

incidents. Since some countries such as Israel, India, Spain, United Kingdom, Sri Lanka, and Turkey have suffered from separatist incidents for many years, these events necessitates a special attention of their own. In order to find if economic well-being has an effect in separatist terrorism, we first need to know the economic conditions in separatist regions in the world and this information is not available directly in any data source. I build an entirely new data set with regional GDP of separatist regions that allows me to look at the determinants of separatist terrorism. I find that separatist terrorists tend to originate from poor areas. In summary, the existing conventional wisdom in economic literature on the lack of economic roots of terrorism may not be as robust as we thought, and some of the data I use suggest that low levels of development do lead to more terrorism.

In section 2, I describe the data set and its categorization. Section 3 explains my empirical strategy. The results of the empirical estimations for international, domestic, and separatist terrorism are reported in section 4. I summarize my main conclusions in section 5.

## 2 Data

For the empirical investigation, I use the data on terrorism, GDP per capita, population, civil liberties, religion, and other control variables for up to 138 countries for the years 1972–2006. More technical information on the description of the variables used and summary statistics is presented in Tables 1 and 2 respectively. The empirical literature on determinants of terrorism focuses primarily on the number of terrorist incidents.<sup>5</sup>

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<sup>5</sup>Alternatively, I could use the number of terrorist incidents divided by population in millions (proxy for the number of terrorists per million) as the dependent variable, but this specification is more restrictive than the specification I use. Therefore I will use the number of terrorist incidents as the dependent variable and control for population in regressions.

Similarly, I use the number of significant terrorist incidents as the dependent variable in our estimations. I define significant terrorist incidents as incidents with fatalities. Data on the number of terrorist incidents with fatalities are obtained from the MIPT (Memorial Institute for Prevention of Terrorism). Terrorism is defined in the data base as violence, or the threat of violence, calculated to create an atmosphere of fear and alarm. Terrorist acts are also intended to produce effects beyond the immediate, having long-term psychological repercussions on a particular victim audience.

The MIPT is a non-profit organization dedicated to prevention of terrorism on US soil. The MIPT Terrorism Knowledge Base has more than 35 years of terrorist incidents data . MIPT integrates several trustable data bases on terrorism. Between 1968 and 1998 the data base includes only international incidents. The 1998-2007 period, on the other hand, includes not only international incidents but also domestic and separatist terrorist incidents. As I mentioned earlier as well, the MIPT data base covers a longer period of time (1968-2007) than the US State Department data set (1997-2003).<sup>6</sup> Within the same time period, the MIPT includes more incidents than the US State department data set. Between 1997 and 2002, the US State Department data set lists 781 significant international incidents; the MIPT data base lists 8172 incidents- 831 of them purely international, 3890 of them are separatist, and 3418 of them are categorized as domestic events.

Using the MIPT data set had its own challenges. The data set was not categorized in terms of the target country and terrorist's country of origin. I categorize the target country and the perpetrator's country of origin in each of 31662 terrorist incidents from the description of each event. The rules for the categorization of terrorist incidents is given in Table 3. The country of occurrence is the country/area where the terrorist

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<sup>6</sup>At the time I started my research, MIPT included data from January 1968 to September 2007.

incident took place and is already given in the data set. Target Country is the country/area of origin of the main target of terrorist incidents. If the main target of the incident is not known, the target country is categorized as the one with the highest number of fatalities. If the main target country is mentioned in the event description it is set as the target even though that country did not have any fatalities in the incident. The perpetrator's country/area is the terrorist's country of origin. If the perpetrator's origin is not mentioned explicitly in the event description, it is taken as the country of origin of the terrorist group responsible for the attack. Unfortunately, in most cases the terrorist group responsible for the attack is not known. If the terrorist group and the perpetrator's origin are not known, the perpetrator's country is taken as the country of occurrence. There are some complicated cases where the perpetrator's origin is not known for sure; in those instances the perpetrator's country is set as unknown.

The terrorist events are also categorized as international, domestic, and separatist. US State Department data set, used by Krueger and Laitin (2007), defines international terrorism as terrorist incidents involving citizens or territory of more than one country. Although this definition helps me to compare my findings with previous literature, it might be misleading and limited. This definition categorizes some domestic and separatist incidents as international if a foreign national is involved, killed, or injured in the incident. For example, if an American tourist is killed by chance in a domestic bombing in Algeria, and the main target is not the US, the incident is coded with this definition as an international incident not separatist or domestic. Therefore, throughout the paper, I will define international terrorism as the terrorist incidents where the target's country is different from terrorist's country of origin.<sup>7</sup>

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<sup>7</sup>Only when I present the replication of the Krueger and Laitin(2007) results using MIPT data, I use the US State Department definition of international terrorism for comparison purposes. Robustness checks are done by using the alternative definition of international terrorism as well.

Terrorist incidents perpetrated by local nationals against a purely domestic target are coded as domestic terrorist incidents. Separatist incidents are excluded from domestic incidents even though in most cases the official citizenship of the target and perpetrator is the same. I define terrorist incidents by separatist movements that aspire to autonomy for a particular group of people from a dominant political institution as separatist incidents. Therefore terrorist incidents such as the ones in the Basque Area, Kashmir, West Bank/Gaza, Southeastern Turkey, South Thailand, Chechenya, etc., are coded as separatist incidents. In order to make my categorizations clear, I include some examples of terrorist incidents in Table 4.

General information on the countries used in estimations and countries with highest number of terrorist incidents are given in appendix A. Table A2 shows the number of terrorist incidents that occurred in different regions in the world. Middle East and Persian Gulf have not only the highest number of international terrorist incidents but also the highest number of separatist and domestic incidents compared with other regions.

To measure economic well-being, I use country-level data on GDP per capita from UN national accounts. Population, growth rates, Gini index of the countries/areas are also taken from UN national accounts. Most of the papers in economic literature use economic data from Penn World Tables or data from the World Bank but these data sets do not include data on conflict regions such as West Bank and Gaza, therefore I prefer to use UN national accounts instead. To measure the (lack of) civil liberties, I use the civil liberties index taken from Freedom House's data set. The civil liberties index runs between 1 and 7, where 7 shows no civil rights. Religion data is taken from CIA factbook, and ethnic, linguistic, and religious fractionalization is taken from Alesina et.al.(2003). Geographical data -distance, common border, common language, and having a colonial link- used in bilateral estimations for international incidents are

taken from CEPII (French Research Center in International Economics).

### 3 Empirical Strategy

#### 3.1 Cross Section Estimations:

In all the estimations the number of terrorist incidents with fatalities is used as the dependent variable. The number of terrorist incidents is an event count, which is the realization of a non-negative integer valued random variable. Therefore, count data estimation techniques are used in the paper. The standard model for count data analysis is the Poisson Regression Model. Poisson regression is a special type of non-linear regression that considers the non-negativity and discreteness of the data.

Let us assume that the number of terrorist incidents with fatalities is shown by the dependent variable  $Terror_i$  in cross-country estimations, where  $i$  stands for the country  $i$ . The independent variables is shown by the  $k$  dimensional vector of covariates,  $x'_i \equiv [\log(GDP)_i, Population_i, Lack\ of\ Civil\ Liberties_i, \dots, x_{ik}]$ , and parameters  $\beta$ . I will use  $\log(GDP)$  as the independent variable of interest and  $x$  vector includes the variables that can potentially affect terrorism such as lack of civil liberties, population, fractionalization, Gini coefficient, etc. Under Poisson regression, the discrete random variable  $Terror_i$  is assumed to be distributed Poisson with intensity parameter  $\mu(x_i, \beta)$  where  $\mu(x_i, \beta) \equiv E(Terror|x)$ .  $Terror_i$  given  $x_i$  is distributed Poisson with the following density function:

$$f(Terror_i|x_i) = \left[ \exp(-\mu_i) \mu_i^{Terror_i} \right] / Terror_i! \quad (1)$$

The log-linear version of the model imposes  $\mu_i = \exp(x_i'\beta)$ , in order to guarantee that  $\mu_i$  is positive. The Poisson model imposes some restrictions on the conditional moments of  $Terror_i$  like the equality of conditional mean and conditional variance (equidispersion):

$$Var(Terror_i|x_i) = E(Terror_i|x_i) = \exp(x_i'\beta) \quad (2)$$

Given the independent variables, the Poisson regression model is estimated by maximum likelihood estimation. One important problem with using Poisson regression models is that the equidispersion assumption may be too restrictive. For example, I find that the number of terrorist incidents in the MIPT data are overdispersed. When there is overdispersion the Poisson estimates are inefficient with standard errors biased downwards, and the computed maximum likelihood Poisson z-statistics overinflated. In order to solve this problem one can use Poisson Quasi-Maximum Likelihood (PQML) estimator with corrected standard errors or Negative Binomial Estimator. Following the previous literature on terrorism, I use Negative Binomial estimations with cross-country regressions. In negative binomial estimations, we relax the variance assumption of Poisson regression model that the variance is equal to mean. Instead the following conditional variance will be used:

$$Var(Terror_i|x_i) = \mu_i + \alpha\mu_i^2$$

where  $\mu_i = \exp(x_i'\beta)$  still holds and  $\alpha$  is a scalar parameter showing the degree of overdispersion. We can see from this condition that when  $\alpha = 0$ , we have the same variance condition as Poisson.<sup>8</sup>

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<sup>8</sup>We will use NB2 model where  $Var(Terror_i|x_i) = \mu_i + \alpha\mu_i^2$ . Alternatively, NB1 variance function is  $Var(Terror_i|x_i) = \mu_i + \alpha\mu_i$

The negative binomial distribution is given by

$$f(Terror|\mu, \alpha) = \frac{\Gamma(Terror + \alpha^{-1})}{\Gamma(Terror + 1)\Gamma(\alpha^{-1})} \left(\frac{\alpha^{-1}}{\alpha^{-1} + \mu}\right)^{\alpha^{-1}} \left(\frac{\mu}{\alpha^{-1} + \mu}\right)^{Terror} \quad (3)$$

where  $\alpha > 0$  and  $\Gamma(\cdot)$  is the gamma function. This density function is equal to a Poisson density if  $\alpha = 0$

Log likelihood function for negative binomial is the following:

$$\begin{aligned} \mathcal{L}^{NB}(\alpha, \beta) = & \sum_{i=1}^n \left\{ \left( \sum_{j=0}^{Terror_i-1} \ln(j + \alpha^{-1}) \right) - \ln(Terror_i!) - (Terror_i + \alpha^{-1}) \right. \\ & \left. \ln(1 + \alpha \exp(x'_i \beta)) + Terror_i \ln \alpha + Terror_i x'_i \beta \right\} \end{aligned} \quad (4)$$

Therefore  $\hat{\alpha}_{NB}$  and  $\hat{\beta}_{NB}$  are the solution of the first order conditions listed below:

$$\sum_{i=1}^n \frac{Terror_i - \mu_i}{1 + \alpha \mu_i} x_i = 0 \quad (5)$$

$$\sum_{i=1}^n \left[ \left( \frac{1}{\alpha^2} \ln(1 + \alpha \mu_i) - \sum_{j=0}^{Terror_i-1} \frac{1}{(j + \alpha^{-1})} \right) + \frac{Terror_i - \mu_i}{\alpha (1 + \alpha \mu_i)} \right] = 0 \quad (6)$$

### 3.2 Panel Data Estimations:

As far as I know, this is the first paper performing panel data estimations in economics literature using targets and origins of terrorism.<sup>9</sup> A very important advantage of using

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<sup>9</sup>Dreher and Gassebner (2008) performs panel data estimations but the authors focus on the country of occurrence but not the target or origins of terrorism. Using negative binomial fixed effects estimations and they find that economic conditions are unrelated with terrorism.

longitudinal data over cross-section data is that they allow for more general types of heterogeneity (Cameron and Trivedi, 1998). In terrorism setting I estimate the impact of economic well-being on the number of significant terrorist incidents in a country, controlling for country specific propensity to be the target or perpetrator of a terrorist incident. In a cross section setting these controls can only depend on country specific characters like civil liberties, but in a panel data setting I include country-specific fixed effects that might include unobserved country-specific propensity to be involved in a terrorist incident.

Panel data estimations are performed by using fixed effects Poisson Quasi Maximum Likelihood estimation. Estimations are done by using the number of terrorist incidents in country  $i$  and year/period  $t$  as the dependent variable following the pioneering work of Hausman et. al. (1984).

Recent literature has highlighted some problems of using negative binomial estimations in longitudinal data setting. Allison and Waterman (2002) argue that the negative binomial fixed effects estimations proposed by Hausman et. al. (1984) is not a true fixed effects model. Authors find that negative binomial fixed effects estimations do not provide any additional leverage for dealing with overdispersion. Guimaraes (2008) confirms the findings of Allison and Waterman (2002) and shows that NB fixed effects model does not necessarily remove the individual fixed effects in count data using a score test. Cameron and Trivedi (1998) show that panel data estimations for count data are most easily done by Poisson estimations and extensions to the negative binomial do not always work. Panel data methods already control for individual heterogeneity and Poisson Quasi Maximum Likelihood(PQML) panel data models with corrected standard errors may be sufficient to treat the overdispersion as we do not include any assumption about conditional variance and conditional mean.

The regular Poisson Fixed Effects Model is given by:

$$Error_{it} \sim Poisson[\mu_{it} = \gamma_i \lambda_{it}]$$

$$\lambda_{it} = \exp(x'_{it}\beta) \quad i = 1, \dots, n \quad t = 1, \dots, T$$

where  $\gamma$  shows the country-specific unobserved parameters. The key difference in count data estimations from regular linear fixed effects estimations is that the individual specific effects are multiplicative not linear. As a result of the exponential form of  $\lambda_{it}$ , I can still interpret the multiplicative effects as a shift in intercept because:

$$E[Error_{it}|x_{it}, \gamma_i] = \mu_{it} = \gamma_i \exp(x'_{it}\beta)$$

$$E[Error_{it}|x_{it}, \gamma_i] = \exp(\delta_i + x'_{it}\beta)$$

where  $\delta_i = \ln \gamma_i$

Poisson ML fixed effects estimator  $\hat{\beta}_{FE}^P$  maximizes the log likelihood function:

$$\mathcal{L}^{NB}(\beta) = \sum_{i=1}^n \ln \left( \sum_{t=1}^{T_i} Error_{it} \right)! - \sum_{t=1}^{T_i} \ln(Error_{it}!) + \sum_{t=1}^{T_i} Error_{it} \ln \left( \frac{\exp(x'_{it}\beta)}{\sum_{r=1}^{T_i} \exp(x'_{ir}\beta)} \right) \quad (7)$$

The assumption of Poisson distribution is stronger than necessary for statistical inference of  $\beta$ . Therefore I will use Poisson Quasi-Maximum Likelihood (PQML) estimator that will maximize equation (7) but is not necessarily distributed Poisson. This relaxes

the equidispersion assumption. PQML estimator has strong robustness properties for estimating parameters. Wooldridge (1997, 2002) argues that PQML has an advantage over NB in estimating because of its robustness. Except for the conditional mean, the distribution of  $Terror_{it}$  given  $(x_i, \alpha_i)$  is entirely unrestricted that there can be overdispersion as well as underdispersion. Therefore, I include only the PQML estimation results for panel data estimations.

## 4 Empirical Results

### 4.1 International Terrorism

In this section, I perform panel data as well as cross-country estimations for targets and origins of terrorism controlling for several determinants of international terrorism. First, following the previous literature, I show the cross-country estimation results, and then I will present the panel data estimation results.

The first and only paper that performs analysis of the targets and origins of international terrorism is Krueger and Laitin (2007). The authors estimate cross-country regressions using US State Department data on the number of significant international terrorist incidents in each country between 1997-2002. For comparison purposes I replicate the Krueger and Laitin (2007) estimations using MIPT data for the very same time period, explanatory variables, and the same definition for international terrorism.

Table 5 presents a comparison of the Krueger and Laitin (2007) estimation results and my results using the MIPT data set. Generally, the estimation results using MIPT are very similar to Krueger and Laitin (2007). When I use the MIPT data I find that perpetrators come from low GDP countries, but when I control for civil liberties and

religion the effect of GDP disappears. It appears that once I control for lack of civil liberties and religion economic conditions are important only for targets but not for perpetrators. Following Krueger and Laitin (2007), I also find that terrorists originate from countries with low civil liberties. Another finding is that international terrorist incidents not only occur in highly populated countries, but also target and originate from countries with significantly higher population. In terms of religion, in contrast to Krueger and Laitin (2007), I find that international terrorist incidents occur significantly more in Muslim countries.

As I have mentioned earlier, one advantage of the MIPT data over the US State Department data set is that it is more up to date. Therefore, I repeat similar cross country estimations using MIPT data from 1998 to 2006. The data between 1998 to 2006 is used because MIPT data started to collect data in domestic and separatist incidents in 1998. I believe that the data is more reliable after 1998 and I can compare the international terrorism results with domestic and separatist terrorism after this year. Table 6 shows the negative binomial estimation results for International Terrorist Incidents between 1998 and 2006. The first three columns show the negative binomial estimation results using the number of significant terrorist incidents that occur in a given country as the dependent variable. Columns (3) and (4) in Table 6 shows the estimation results using as the dependent variable the number of international incidents that target in a given country. Last two columns in Table 6 shows the estimation results using the number of international terrorist incidents that originate from a given country as the dependent variable.

Following Krueger and Laitin (2007), I use lack of civil liberties and lack of civil liberties squared as independent variables. The same estimations are done with the lack of political liberties and political liberties squared, as the results do not differ much, I

will only show the results using lack of civil liberties. Log GDP per capita is used as the independent variable of interest. Following Krueger and Laitin (2007), I also use population, religion, and lagged average growth rates from 1990-1997 as other controls. Like Abadie (2004), I use ethnic, linguistic and religious fractionalization as other independent variables. Table 6 reports that, in line with previous literature, richer countries are the main targets of international terrorist incidents, but international incidents have no economic roots. I also find that the targets of terrorism, just like the perpetrators' countries of origin, are the countries in the middle range of civil liberties, rather than the countries with low or high civil liberties. Abadie (2004) found similar results for political rights.

Another finding is that countries with a higher proportion of Muslims have higher levels of international terrorism within their borders and are targeted significantly more compared to countries with a higher proportion of Christians. Higher ethnic fractionalization seems to impact whether one turns to terrorism or not. There is a negative and significant effect of ethnic fractionalization on the number of international terrorist incidents originating from that country. If the terrorist comes from an ethnically diverse country, he might experience the ethnic differences within the countries they already grow up and this might decrease the violence against people with different ethnic backgrounds by increasing tolerance towards people. This might result in a decrease in the number of international terrorist incidents that are usually directed at people from a different ethnic background than the terrorist. Alternatively, one can think that ethnically fragmented countries are busy terrorizing among domestic nationals and thus do not consider attacking foreign nationals.

As an alternative way of estimation following the relevant international trade literature, I use bilateral estimations for international incidents where the targets of terrorist

incidents and its origins are grouped together. Bilateral estimation results for international terrorist incidents between 1998 and 2006 are listed in Table 7. Similar estimations using US State Department data set can be seen in Krueger (2007). Blomberg and Hess (2005) also does similar bilateral estimations for international terrorism using ITERATE data set.

The dependent variable used in bilateral estimations is the number of terrorist incidents targeting country  $i$  and originating in country  $j$  at time  $t$ . Using the paired data has its own advantages. I can control for some geographical variables such as countries having a common border, one being the former colony of the other and the distance between the attacker and the victim of the attack.<sup>10</sup>

In estimation (1) in Table 7, it can be seen that terrorists originate from poorer countries and tend to target richer countries, yet once we control for civil liberties the significant relation disappears. I also find that the number of international terrorist incidents falls when the distance between the target and perpetrator increases. As the distance might raise the cost of terrorist activity this result is quite intuitive. I also find that having a common border and having a colonial link in history increases the number of incidents.

Following Krueger (2007), when I use the absolute economic conditions of the perpetrator's country of origin and target's country I find that terrorist attacks targeting a given country is an increasing function of that country's per capita GDP but is unrelated with the GDP per capita levels of the terrorist's country of origin. Terrorists that engage in international terrorism significantly originate from countries with medium civil

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<sup>10</sup>Rather than the regular control variables I used in the previous cross country estimations, I also control for the target having a different religion from the terrorist's country of origin. I furthermore control whether the target has ever occupied the terrorist's country of origin before in history in line with Krueger (2007). The results are found to be similar, therefore I do not list the results.

liberties. I can not find any robust effect of the target's civil liberties. Surprisingly, perpetrator's lagged GDP growth has a positive and significant effect on the number of terrorist incidents. I find that religion of the perpetrator's country is important as well. Terrorists originating from Muslim countries tend to engage in more international terrorist incidents compared to their Christian counterparts.

#### **4.1.1 Panel Data Estimation Results**

As mentioned earlier one of the contributions of this paper is that I can employ panel data estimation techniques as the MIPT data set goes much further back in time. I employ Poisson Quasi-Maximum (PQML) fixed effects estimations because of its robustness properties.

It may be argued that terrorism is affected by longer term changes in GDP levels but not year to year changes in GDP levels. I believe that this is a reasonable argument for panel data estimations. I generate a five-year period data for international terrorist incidents between 1972 to 2006 and perform PQML fixed effects estimations with five-year period data. In contrast to cross country estimation results and results in previous literature Table 8 shows that poverty is a significant source of international terrorism. I find that the citizens are more likely to engage in international terrorism in countries whose economic situation worsens In contrast to the cross-section estimation results, I find that improvement of economic well-being within a country doesn't increase the probability of being the target of an international terrorist incidents. These results for international terrorism holds for yearly panel data estimations from 1998-2006 as well as 1972-2006. These results can be seen in Tables 9 and 10, respectively.

Therefore, the panel data fixed effects estimation results for international terrorist incidents are quite different from cross-country estimation results. As I mentioned earlier,

following the previous literature I do not find any significant relation between economic development and terrorism in cross section estimations. When I control for country-specific fixed effects, however, I find that countries that become richer over time export less terrorism/terrorists. Additionally in contrast to the cross country results, I find that, countries that grow richer over time do not attract more terrorist attacks. These differences between cross section and panel data results suggest the importance of controlling for country-specific omitted variables by using panel data fixed effects estimations in terrorism setting.

## **4.2 Domestic and Separatist Terrorism**

According to MIPT data set, more than 50% of all terrorist incidents between 1998 and 2006 are domestic in nature. Therefore, a comprehensive investigation of the nature of terrorism must also include a study of determinants of domestic terrorism. This suggests the importance of finding the determinants of domestic terrorism. Estimation results for domestic terrorist incidents using cross-country data are similar to the findings of Feldman and Ruffle (2008). Table 11 shows the cross-country estimation results using negative binomial estimations. As the country of occurrence, target's country and terrorist's country of origin is the same for domestic incidents, I do not use separate estimations here. Results in the first column show that domestic incidents occur in poorer and crowded countries. Once I control for civil rights, religion, and growth I find that economics does not play a significant role. Domestic terrorism occurs in countries with medium level of civil liberties. Another important economic variable that is important for domestic terrorism is the Gini coefficient and urban population but I cannot find any link between income inequality and urbanization and domestic terrorism in nega-

tive binomial estimations. Surprisingly, Poisson Quasi Maximum Likelihood estimations suggest a different result. I find a positive and significant link between Gini coefficient and domestic terrorism. This result can be seen in Table 11 column (4). Therefore, more income inequality might suggest higher domestic terrorist attacks, depending on the specification.

The Poisson QML fixed effects estimations for domestic incidents are shown in Table 12. I find that number of domestic terrorist incidents decreases with increases in economic well-being. Just as in the cross-section estimation results, I find that domestic terrorism is highest in countries with medium level civil liberties. Panel data estimations in Table 12 are performed for domestic terrorism for a shorter period of time (1998-2006) compared to panel data estimations for international terrorism (1972-2006). Lack of availability of domestic terrorism data for a long period, makes it impossible to perform five-year period panel data estimations. I can only perform panel data estimations using the number of incidents in each country in each year<sup>11</sup>.

Using negative binomial cross country estimations, Table 13 shows that the countries that suffer from separatist terrorist incidents are significantly richer when I control for ethnic, religious, and linguistic fractionalization. Column (3) in Table 13 also indicates that the targets of terrorist incidents are significantly high population countries with high linguistic fractionalization but low growth rates and medium level civil liberties. It also shows that religion is significantly important for separatist incidents. Although the results given in Table 13 are interesting, we don't use any information on the economic conditions of separatist regions in these estimations.

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<sup>11</sup>It might be argued that changes in economic well-being within countries are important in a longer term than one year. For this reason yearly panel data might not be as informative as five-year period data. Therefore, the results listed for domestic terrorist incidents may not be as suggestive as international terrorist incidents.

In order to find the economic origins of separatist terrorism, we need to know the economic conditions in separatist regions. I generate an entirely new data set with regional GDP of separatist regions, which allows me to look at the determinants of separatist terrorism. It is difficult to come up with precise data for separatist areas GDP per capita levels. I tried to overcome these difficulties about the data as much as I could and come up with approximations on GDP levels by setting some rules. If a specified separatist terrorist group is responsible for the attack, then the area(s) for which the terrorist group demands autonomy is identified as the separatist region. If the terrorist group is not known, the separatist region is identified as the region where most of the terrorist incidents take place. For example, when we look at the separatist incidents in southeastern Turkey, the terrorist group PKK (Kurdistan Workers Party) demands independence of certain cities in southeastern Turkey. These are also the cities that are highly affected by separatist terrorism. These cities include Adıyaman, Bingöl, Bitlis, Diyarbakir, Elazığ, Hakkari, Mardin, Muş, Tunceli, Van, Siirt, Batman and Şırnak in Turkey. I generate an average GDP level for the cities for the GDP level of the separatist region. Data set on the GDP per capita levels for these cities are taken from Turkish State Institute of Statistics. Likewise, data for other areas in which separatist terrorist incidents take place are gathered from different sources for each separatist area, including Eurostat, UN Human Development Reports, Central Banks and State Institutes of Statistics of relevant countries.

Table 14 lists the bilateral negative binomial estimation results for the separatist areas. The dependent variable is the number of separatist incidents originating from the separatist area  $i$  from country  $j$ . In these estimations the target is the mainland and the terrorist's origin is the separatist region/area. In Turkey, for example, mainland's GDP stands for entire GDP of Turkey, and GDP of the separatist area stands for the

GDP level in Southeastern Turkey. The results suggests that separatist terrorism is significantly higher in poor areas. I find that the higher the relative GDP (GDP of the mainland/GDP of the separatist area), the higher is the number of separatist incidents in the separatist area. The Gini coefficient also plays an important role here. The higher the income inequality, the higher will be the number of separatist incidents. I also find that number of separatist incidents in separatist areas increase with the central government's ethnic and linguistic fractionalization. Civil liberties are shown to explain separatist terrorism, but like international and domestic incidents, it does so in a non-monotonic way. Countries with moderate civil liberties tend to be the targets of separatist incidents.<sup>12</sup> Unfortunately, it is not possible to come up with panel data results in separatist terrorism. Although it is possible to generate GDP levels for different years in separatist regions of some countries, such as Turkey, India, Thailand, Israel, and Spain the data is quite limited in other countries. As a future work, a case study using yearly data on development in a specific separatist region, as well as the number of separatist incidents, can be done to gain more insight about separatist terrorism and its economic roots.

### 4.3 Robustness Checks

One of the main empirical problems in the economics of terrorism literature is the problem of endogeneity. Several studies have found that terrorism effect economic outcomes. (e.g. Abadie and Gardeazabal, 2003). Abadie (2004) mentions that as terrorism is adversely related to economic conditions and ordinary estimates of the effect of poverty on terrorism are biased downwards. All of the estimations in this paper are done using the

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<sup>12</sup>The main problem with these estimations, in Table 14, is the low degrees of freedom. I specify only 30 areas in the world that are the perpetrator's origin for separatist terrorist incidents.

lagged values of the economic conditions. Although we can argue that this might treat the problem to some extent it doesn't help us get rid of the endogeneity problem altogether. Abadie (2004) uses instrumental variables (IV) approach to solve the endogeneity problem and still find that economic conditions are not related to terrorist risk. Following Abadie (2004), I have performed cross-section IV estimations using being landlocked and latitude as instruments. Assuming that these are good instruments, the findings in the paper do not change when I use the IV estimations.<sup>13</sup> In addition to the instrumental variables estimations, I have repeated the Maximum Likelihood Estimations in the paper using Generalized Method of Moments (GMM) Estimations. GMM estimations are useful in the presence of explanatory variables that are not strictly exogenous. The main conclusions of the paper do not change using GMM estimations.

Estimations in this paper are done using the number of incidents with fatalities as the dependent variable. Same estimations are also done using the number of terrorist incidents (with and without fatalities) and number of fatalities as dependent variables. The results are robust when I use different dependent variables for terrorism.<sup>14</sup> In addition to this estimations are repeated using the interaction terms of economic conditions with civil liberties and religion but the interaction terms do not significantly affect terrorism therefore I do not show the results with interaction terms. Estimations are also done using the first differences but the results are not robust, I do not find any significant relationship between economic conditions and terrorism using the first differences.

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<sup>13</sup>I did not perform IV estimations in panel data setting because of the lack of relevant instruments.

<sup>14</sup>As I mentioned earlier in the paper, I also do robustness checks using an alternative definition for international terrorism and the estimation results do not change significantly.

## 5 Conclusion

In order to fight against terrorism, it is important to understand its root causes. In this paper, I question whether changes in economic conditions have a significant effect on international, domestic, and separatist terrorism. Empirical results in the previous literature suggest that economic conditions are mostly unrelated to terrorism. I argue that these results may not be as robust as we thought, and some of the data I use suggest that low levels of development do lead to terrorism. Using a more up-to-date, and arguably better, panel data set on international terrorism, I find that countries that get richer over time export fewer international terrorism and do not attract more terrorist attacks from abroad. Similarly, I find that when a country is richer over time, the country's nationals commit fewer terrorist attacks at home. I build an entirely new data set with regional GDP of separatist regions and find that the higher the GDP of the separatist region, the fewer will be terrorist attacks committed by native separatists.

Empirical findings in this paper suggest that the policy makers should be more cautious in ruling out the effect of economics on terrorism. My findings show that economic policies can be used to fight against terrorism in specific settings. The findings of separatist terrorism suggest that it is important to consider the causes of separatist terrorism different from domestic and international terrorism. The economic roots of separatist terrorism can be understood more fully through country-specific studies, which I leave for a future work.

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**Table 1: Description of the Variables**

<b>Variables</b>	<b>Description</b>
<i>International Incidents Occurred</i>	Total number of international terrorist incidents with fatalities occurred in the country/ area.
<i>Domestic Incidents Occurred</i>	Total number of incidents perpetrated by local nationals against a purely domestic target.
<i>Separatist Incidents Occurred</i>	Total number of separatist Incidents occurred in the country/ area.
<i>International Incidents Occurred</i>	Total number of international terrorist incidents that target the country/ area.
<i>International Incidents Made</i>	Total number of international incidents that the country/ area is the country of origin of the perpetrator/ terrorist.
<i>Separatist Incidents Made</i>	Total number of separatist incidents that the area is the country of origin of the perpetrator/ terrorist.
<i>Bilateral International Incidents</i>	Total number of international terrorist incidents with fatalities for a given pair of target and perpetrator's country. (Used in Bilateral Estimations)
	<i>Source: Author's categorizations and calculations from MIPT data set</i>
<i>Log GDP per capita</i>	Log of nominal GDP per capita(averaged lagged value) (Kruger replicate estimations 1997-2001, Cross Section estimations 1998-2005, Panel Data Estimations lagged value)
<i>Log Relative GDP per capita</i>	Log (Target's GDP per capita/ Perpetrator's GDP per capita)
<i>Log Population</i>	Log of Population
<i>Growth</i>	Growth rate of GDP per capita (averaged lagged value). (Kruger replicate estimations 1990-2000, Cross Section estimations 1990-1997, Panel Data Estimations lagged value)
<i>Gini Index</i>	Gini Index on income. Range between 0 and 100. 100 shows perfect inequality.
	<i>Source: UN National Accounts</i>
<i>Lack of Civil Liberties</i>	Lack of Civil Liberties shown by an index number between 1 and 7. 7 shows no civil liberties.
<i>Lack of Civil Squared</i>	Squared value of lack of civil liberties.
	<i>Source: Freedom House</i>
<i>Muslim</i>	Proportion of Muslim living in the country/area.
<i>Buddhist</i>	Proportion of Buddhist living in the country/area.
<i>Hindu</i>	Proportion of Hindu living in the country/area.
<i>Others</i>	Proportion of people who are not Christian, Muslim, Buddhist or Hindu living in the country/area.
	<i>Source: CIA World Factbook</i>
<i>Ethnic</i>	Ethnic Fractionalization
<i>Linguistic</i>	Linguistic Fractionalization
<i>Religious</i>	Religious Fractionalization
	Index number between 0 and 1. Shows the probability of two individuals chosen randomly from same country belong a different ethnic/ linguistic/ religious group.
	<i>Source: Alesina et.al. 2003</i>
<i>Distance</i>	Bilateral distances between the biggest cities of those countries
<i>Common Border</i>	Dummy variable indicating whether the two countries are contiguous
<i>Common Language</i>	Dummy variable indicating whether the two countries share a common language
<i>Colony</i>	Dummy variable indicating whether the two countries have ever had a colonial link
	<i>Source: French Research Center in International Economics (CEPII)</i>
<i>Occupied</i>	Dummy variable equals to 1 if the country is occupied by any other country in the world
<i>Occupier</i>	Dummy variable equals to 1 if the target country occupied by any other country in the world
	<i>Source: Krueger(2007)</i>

**Table 2: Summary Statistics**<sup>1</sup>

Variables	Obs.	Mean	Std. Dev.	Min	Max
<i>Terrorism:</i>					
International Attacks Occurred	158	3.22	19.92	0	265
Domestic Attacks Occurred	158	33.94	328.18	0	4574
Separatist Attacks Occurred	158	10.88	60.87	0	700
International Attacks Received	158	3.22	13.12	0	155
International Attacks Made	158	3.22	20.72	0	269
Separatist Attacks Made	32	64.44	146.48	0	704
<i>Civil Liberties:</i>					
Lack of Civil Liberties	155	3.51	1.77	1	7
Population(millions)	154	39.2	136	0.003149	1280
<i>Economic Variables:</i>					
GDP per capita	155	7192.67	11140.79	103.5	57019.5
Growth	156	2.28	4.44	-14.47	14.29
Gini	123	40.00	9.90	24.00	70.70
<i>Fractionalization:</i>					
Ethnic	151	0.46	0.25	0	0.93
Linguistic	147	0.39	0.28	0	0.92
Religious	152	0.43	0.24	0	0.86
<i>Religion:</i>					
Christian	150	0.55	0.39	0	1
Muslim	151	0.24	0.36	0	1
Buddhist	151	0.05	0.19	0	0.96
Hindu	150	0.03	0.13	0	0.87
Others	151	0.14	0.20	0	1

<sup>1</sup> Summary statistics for variables used in cross country estimations between 1998 and 2006.

Note: All terrorist incidents show the number of incidents with fatalities

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**Table 3: Data Categorization Rules**

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Country of Occurrence	Already given in the data base.
Target Country	1) Country that is the main target of the incident (gathered from the incident short summary). 2) If the main target is not known, it is assumed to be the country with highest number of fatalities. 3) If there is ambiguity on the target is set as unknown.
Perpetrator's Country	1) Country that is the terrorist's country of origin. 2) If perpetrator's country not known it is assumed to be the terrorist's group base country. 3) If the terrorist group responsible from the attack is not know, it is set as the country of occurrence.
International Incidents	Terrorist attack where the target's country is different from perpetrator's country of origin Alternative definition: Terrorist attack involving citizens or the territory of more than one country. (Alternative Definition is used only for the results in Krueger et.al.. (2007) replicate estimations for comparison purposes )
Domestic Incidents	Terrorist incidents where the target's country, perpetrator's country and the country of occurrence are the same. (We exclude separatist incidents even though the official citizenship of the target, perpetrator are the same in most of the cases)
Separatist Incidents	Terrorist incidents by separatist movements that aspire to autonomy for a particular group of people from a dominant political institution.

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**Table 4: Examples on Terrorist Incident Categorization**

<i>Description of the event</i>	<i>Country Of Occurrence</i>	<i>Target's Country</i>	<i>Perpetrator's Country/ Area</i>	<i>Incident Type</i>
1) "TANZANIA. A suicide car bomb exploded outside the U.S. Embassy in Dar es Salaam. The attack coincides with another suicide attack on the US Embassy in Kenya. The blast killed at least eleven individuals and injured seventy-seven others. No Americans were killed in the attack, and it is unclear how many were injured. Osama Bin Laden's group Al-Qaeda has claimed responsibility for the blast.	Tanzania	United States	Afghanistan	International
2) "SPAIN. An ETA bomb was found and defused at the Delfin Park Hotel in Salou. All guests were safely evacuated."	Spain	Spain	Basque Region	Separatist
3) "PERU, An explosive device detonated in downtown Peru near the National Election Board. Officials are attributing the explosion to a leftist guerrilla group, possibly the Shining Path (SL).	Peru	Peru	Peru	Domestic

**Table 5: Negative Binomial Cross Section Estimation Results for International Terrorist Incidents, MIPT versus Krueger et. al. (2007) Results**  
 Dependent Variable: Number of significant international terrorist incidents in each country between 1997-2002

<i>Explanatory Variables</i>	MIPT						Krueger et.al (2007) estimations					
	Occurrence		Target		Perpetrator		Occurrence		Target		Perpetrator	
	(1)	(2)	(3)	(4)	(5)	(6)	(1')	(2')	(3')	(4')	(5')	(6')
<i>Log GDP per capita</i>	-0.13*	0.19*	0.31***	0.5***	-0.3**	0.04	-0.13*	0.12	0.31***	0.43***	-0.17	0.23
	(0.11)	(0.13)	(0.09)	(0.13)	(0.12)	(0.17)	(0.11)	(0.19)	(0.08)	(0.14)	(0.12)	(0.20)
<i>Log Population</i>	0.54***	0.67***	0.75***	0.75***	0.53***	0.62***	0.64***	0.7**	0.76***	0.73***	0.74***	0.94***
	(0.13)	(0.11)	(0.10)	(0.12)	(0.13)	(0.12)	(0.12)	(0.14)	(0.08)	(0.10)	(0.16)	(0.17)
<i>GDP Growth</i>		-0.02		-0.06		-0.02		-0.05		-0.44		-0.42
		(0.06)		(0.06)		(0.06)		(0.68)		(0.58)		(0.72)
<i>Lack of Civil Liberties</i>		0.42***		0.22		0.46***		0.5**		0.17		0.8**
		(0.12)		(0.11)		(0.14)		(0.25)		(0.16)		(0.27)
<i>Proportion Muslim</i>		1.11		0.72*		0.67		-0.52		-0.45		-0.35
		(0.46)*		(0.53)		(0.55)		(0.70)		(0.50)		(0.76)
<i>Proportion Buddhist</i>		0.37		0.69		0.03		1.42		-1.11		-1.25
		(0.74)		(0.90)		(0.72)		(1.02)		(0.83)		(1.16)
<i>Proportion Hindu</i>		-1.2		0.85		-0.82		0.25		1.34		0.32
		(1.03)		(0.72)		(0.94)		(1.36)		(0.98)		(1.59)
<i>Proportion of Other</i>		1.04		1.36*		-1.03		0.87		0.88*		1.52**
		(1.19)		(1.14)		(1.83)		(0.90)		(0.67)		(0.91)
<i>Constant</i>	-7.96***	-14.65***	-15.04***	-17.89***	-6.71***	-12.41***	-8.28***	-13.03***	-13.97***	-14.98***	-9.65***	-19.39***
	(2.39)	(2.35)	(1.89)	(2.77)	(2.52)	(2.88)	(2.27)	(3.01)	(1.56)	(2.08)	(2.83)	(3.72)
<i>Sample Size</i>	150	138	150	138	150	138	150	138	150	138	150	138
<i>Pseudo R-squared</i>	0.06	0.11	0.17	0.18	0.07	0.16	0.05	0.07	0.13	0.14	0.05	0.09

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

**Table 6 : Negative Binomial Cross Section Estimation Results for International Terrorist Incidents**Dependent Variable: Number of significant<sup>1</sup> international incidents in each country (1998-2006)

Explanatory Variables	Country of Occurrence		Target's Country		Perpetrator's Country of Origin	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Log GDP per capita</i>	-0.23 (0.19)	0.45*** (0.13)	0.35*** (0.10)	0.82*** (0.16)	-0.33 (0.23)	0.31** (0.14)
<i>Log Population</i>	0.78*** (0.20)	0.91*** (0.14)	0.70*** (0.11)	0.79*** (0.11)	0.78*** (0.23)	0.88*** (0.17)
<i>Growth</i>		0.01 (0.04)		-0.02 (0.05)		0.00 (0.03)
<i>Lack of Civil Liberties</i>		2.08*** (0.49)		1.13** (0.46)		2.90*** (0.63)
<i>Lack of Civil Squared</i>		-0.15*** (0.06)		-0.10* (0.05)		-0.23*** (0.07)
<i>Muslim</i>		1.27** (0.59)		1.30*** (0.50)		0.76 (0.64)
<i>Buddhist</i>		-1.33 (1.11)		-0.50 (0.92)		-1.44 (0.97)
<i>Hindu</i>		-1.99* (1.04)		1.51 (1.66)		-0.10 (1.18)
<i>Others</i>		-0.02 (1.25)		-0.26 (1.02)		-1.17 (1.85)
<i>Ethnic</i>		-1.66** (0.78)		-0.31 (0.70)		-2.24** (0.94)
<i>Linguistic</i>		0.23 (0.69)		0.04 (0.67)		0.14 (0.80)
<i>Religious</i>		-0.27 (0.79)		0.49 (0.74)		-0.47 (0.91)
<i>Constant</i>	-10.02*** (3.11)	-22.92*** (3.37)	-13.63*** (2.03)	-21.72*** (2.89)	-9.40** (3.92)	-22.74*** (4.08)
<i>Observations</i>	138	138	138	138	138	138
<i>Pseudo R-squared</i>	0.05	0.20	0.12	0.16	0.06	0.22

<sup>1</sup> incidents with fatalities

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

**Table 7 :Bilateral Negative Binomial Cross Section Estimations for International Incidents**

Dependent Variable: Number of significant<sup>1</sup> international terrorist incidents for a given pair of target's country and perpetrator's country of origin (1998-2006)

Explanatory Variables	(1)	(2)	(3)	(4)
<i>Perpetrator's Variables:</i>				
<i>Log GDP per capita</i>	-0.47*** (0.08)	-0.01 (0.07)	-0.05 (0.10)	
<i>Growth</i>			0.03 (0.02)	0.06** (0.02)
<i>Log Population</i>	0.6*** (0.07)	0.64*** (0.07)	0.66*** (0.08)	0.63*** (0.09)
<i>Lack of Civil Liberties</i>		0.86*** (0.08)	1.67*** (0.35)	1.30*** (0.33)
<i>Lack of Civil Squared</i>			-0.11** (0.04)	-0.07** (0.04)
<i>Religion</i>			Yes	Yes
<i>Fractionalization</i>			Yes	Yes
<i>Target's Variables:</i>				
<i>Log GDP per capita</i>	0.62*** (0.09)	0.63*** (0.10)	0.51*** (0.09)	0.03* (0.02)
<i>Growth</i>			0.03* (0.02)	0.88*** (0.12)
<i>Log Population</i>	0.95*** (0.15)	0.94*** (0.13)	0.89** (0.12)	-0.76** (0.32)
<i>Lack of Civil Liberties</i>		0.05 (0.07)	-0.3 (0.33)	0.08 (0.04)*
<i>Lack of Civil Squared</i>			0.04 (0.04)	
<i>Other Variables</i>				
<i>Log Relative GDP<sup>2</sup></i>				0.30*** (0.06)
<i>Distance</i>	-0.33*** (0.07)	-0.29*** (0.06)	-0.21*** (0.06)	-0.21*** (0.06)
<i>Common Border</i>			1.92*** (0.42)	1.89*** (0.41)
<i>Common Language</i>			0.37* (0.28)	0.4* (0.28)
<i>Colony</i>			0.92** (0.40)	0.97** (0.41)
<i>Constant</i>	-30.15*** (3.35)	-38.63*** (3.29)	-37.82*** (3.24)	-31.62*** (2.79)
<i>Number of Observations</i>	23104	23104	20976	20976
<i>Pseudo R-Squared</i>	0.18	0.24	0.29	0.28

<sup>1</sup> incidents with fatalities

<sup>2</sup>Relative GDP per capita =GDP per capita of target/ GDP per capita of perpetrator

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

**Table 8: Panel Data Poisson QML FE Estimations for International Terrorist Incidents (Five-year)**

Dependent Variable: Five- year period number of significant<sup>1</sup> international incidents in each country between 1972 and 2006

Explanatory Variables	Country of Occurrence		Target Country		Perpetrator's Country	
	(1)	(2)	(3)	(4)	(5)	(6)
Log GDP per capita	-0.88*** (0.23)	-0.84*** (0.23)	0.18 (0.26)	0.12 (0.24)	-0.75** (0.30)	-0.74*** (0.27)
Log Population	2.52*** (0.83)	2.56*** (0.88)	0.31 (0.63)	0.15 (0.64)	1.60* (1.12)	1.60* (1.22)
Lack of Civil Liberties		0.31 (0.38)		0.61** (0.28)		0.86 (0.50)
Lack of Civil Squared		-0.02 (0.05)		-0.08** (0.04)		-0.08* (0.06)
GDP Growth		0.00 (0.01)		0.00 (0.01)		-0.02 (0.02)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	778	773	736	726	697	693
Number of Countries	116	116	113	112	104	104

<sup>1</sup> incidents with fatalities

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

**Table 9: Panel Data Poisson QML FE Estimations for International Terrorist Incidents(1998-2006)**

Dependent Variable: Number of significant<sup>1</sup> international terrorist incidents in each country each year

Explanatory Variables	Country of Occurrence		Target Country		Perpetrator's Country	
	(1)	(2)	(3)	(4)	(5)	(6)
Log GDP per capita	-1.4* (0.82)	-1.00 (0.72)	0.15 (1.16)	-0.2 (0.87)	-1.62** (0.78)	-1.45*** (0.20)
Log Population	0.48 (5.98)	1.74 (5.95)	1.23 (5.03)	2.1 (4.66)	5.18 (5.55)	5.76* (3.01)
Lack of Civil Liberties		-0.1 (0.88)		-0.82 (0.75)		0.65 (0.38)
Lack of Civil Squared		0.11 (0.10)		0.07 (0.09)		0.04 (0.04)
GDP Growth		-0.02 (0.03)		0.01 (0.03)		0.03*** (0.01)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Observations	558	466	630	520	426	426
Number of Countries	62	59	70	65	54	54

<sup>1</sup> incidents with fatalities

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

**Table 10: Panel Data Poisson QML FE Results for International Terrorist Incidents (1972-2006)**

*Dependent Variable: Number of significant<sup>1</sup> international incidents in each country between 1972-2006*

<i>Explanatory Variables</i>	<i>Country of Occurrence</i>		<i>Target Country</i>		<i>Perpetrator's Country</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Log GDP per capita</i>	-0.73*** (0.19)	-0.69*** (0.21)	0.26 (0.23)	0.25 (0.22)	-0.65*** (0.25)	-0.6** (0.26)
<i>Log Population</i>	2.51*** (0.81)	2.63*** (0.85)	0.32 (0.61)	0.33 (0.61)	1.54 (1.13)	1.69 (1.23)
<i>Lack of Civil Liberties</i>		0.05 (0.36)		0.38 (0.20)		0.43 (0.46)
<i>Lack of Civil Squared</i>		0.01 (0.04)		-0.06** (0.02)		-0.02 (0.05)
<i>GDP Growth</i>		0.00 0.00		0.00 0.00		0.00 (0.01)
<i>Year Dummies</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Observations</i>	3739	3694	3511	3432	3333	3295
<i>Number of Countries</i>	116	116	113	111	103	103

<sup>1</sup> incidents with fatalities

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

**Table 11 : Cross Section Estimation Results for Domestic Terrorist Incidents**

*Dependent Variable: Number of significant<sup>1</sup> domestic terrorist incidents in each country between 1998-2006*

<i>Explanatory Variables</i>	NB (1)	NB (2)	NB (3)	PQML (4)
<i>Log GDP per capita</i>	-0.55*** (0.12)	0.47 (0.31)	0.52* (0.31)	-0.41 (0.61)
<i>Gini</i>	0.04 (0.03)	0.01 (0.03)	0.01 (0.03)	0.14*** (0.05)
<i>Log Population</i>	0.97*** (0.17)	0.82*** (0.15)	0.82*** (0.15)	1.67*** (0.36)
<i>Growth</i>		-0.02 (0.04)	-0.03 (0.04)	-0.18** (0.08)
<i>Lack of Civil Liberties</i>		3.87*** (0.96)	3.92*** (0.92)	7.42*** (2.44)
<i>Lack of Civil Squared</i>		-0.43*** (0.10)	0.44*** (0.10)	-0.78*** (0.26)
<i>Muslim</i>		0.1 (1.13)	0.06 (1.13)	-0.79 (0.83)
<i>Buddhist</i>		-0.1 (0.87)	-0.15 (0.93)	-0.70 (0.91)
<i>Hindu</i>		1.57 (1.11)	1.51 (1.19)	-1.51 (1.54)
<i>Others</i>		-2.57** (1.29)	-2.63** (1.26)	-7.83* (4.76)
<i>Ethnic</i>		-0.18 (1.19)	-0.15 (1.20)	1.22 (2.01)
<i>Linguistic</i>		-0.06 (0.94)	-0.06 (0.94)	-0.20 (1.62)
<i>Religious</i>		-1.38 (1.30)	-1.39 (1.32)	-4.64*** (1.57)
<i>Urban Population</i>			0.00 (0.02)	-0.04 (0.03)
<i>Constant</i>	-11.67*** (3.33)	-22.61*** (4.83)	-22.9*** (4.55)	-47.39*** (12.15)
<i>Observations</i>	109	109	109	109
<i>Pseudo R-squared</i>	0.09	0.15	0.15	0.75

<sup>1</sup> incidents with fatalities

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

NB stands for Negative Binomial Estimations

PQML stands for Poisson Quasi Maximum Likelihood Estimations

**Table 12: Panel Data Fixed effects Estimation Results for Domestic Terrorist Incidents**

*Dependent Variable: Number of significant<sup>1</sup> domestic terrorist incidents in each country each year between 1998-2006*

<i>Explanatory Variables</i>	<i>Country of Occurrence</i>	
	<i>(1)</i>	<i>(2)</i>
<i>Log GDP per capita</i>	-0.43*** (0.16)	-1.21*** (0.24)
<i>Log Population</i>	6.76*** (0.78)	1.46 (1.95)
<i>Lack of Civil Liberties</i>		1.84*** (0.50)
<i>Lack of Civil Squared</i>		-0.12** (0.06)
<i>GDP Growth</i>		0.03*** (0.01)
<i>Year Dummies</i>	Yes	Yes
<i>Observations</i>	514	514
<i>Number of Countries</i>	65	65

<sup>1</sup> incidents with fatalities

*Standard errors in parentheses*

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

**Table 13: Negative Binomial Cross Section Estimation Results for Separatist Terrorist Incidents**

*Dependent Variable: Number of significant<sup>1</sup> separatist terrorist incidents in each country (1998-2006)*

<i>Explanatory Variables</i>	<i>Country of Occurrence/ Target Country</i>		
	(1)	(2)	(3)
<i>Log GDP per capita</i>	0.51 (0.37)	0.66** (0.32)	2.30*** (0.53)
<i>Log Population</i>	1.18*** (0.39)	3.15*** (0.58)	2.48*** (0.68)
<i>Growth</i>		-0.56*** (0.12)	-0.44*** (0.16)
<i>Lack of Civil Liberties</i>		-0.07 (0.46)	7.00*** (2.38)
<i>Lack of Civil Squared</i>			-0.86*** (0.28)
<i>Muslim</i>		0.43 (1.79)	-1.96 (2.74)
<i>Buddhist</i>		11.92*** (2.25)	8.69*** (2.94)
<i>Hindu</i>		-1.63 (2.45)	-5.54 (7.91)
<i>Others</i>		11.62*** (2.18)	1.82 (2.89)
<i>Ethnic</i>			-9.74 (7.56)
<i>Linguistic</i>			17.60** (7.26)
<i>Religious</i>			0.81 (4.06)
<i>Constant</i>	-21.90*** (7.66)	-59.30*** (11.62)	-75.64*** (16.21)
<i>Observations</i>	109	109	109
<i>Pseudo R-squared</i>	0.02	0.10	0.16

<sup>1</sup> incidents with fatalities

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

**Table 14 : Bilateral Negative Binomial Cross Section Estimation Results for Separatist Terrorist Incidents**  
*Dependent Variable: Number of significant<sup>1</sup> separatist terrorist incidents in separatist region (1998-2006)*

Explanatory Variables	Separatist Region ( Perpetrator's Area of Origin)			
	(1)	(2)	(3)	(4)
<i>Separatist Area's Variables</i>				
<i>Log GDP per capita</i>	-1.12*** (0.35)	-0.65** (0.30)	-0.66** (0.32)	
<i>Log Relative GDP per capita<sup>2</sup></i>				1.06*** (0.32)
<i>Buddhist</i>			1.54 (3.17)	-1.85 (9.47)
<i>Hindu</i>			-0.56 (1.23)	-1.06 (1.03)
<i>Muslim</i>			3.29*** (1.04)	1.62 (1.21)
<i>Others</i>			-2.41 (1.66)	-4.42** (1.73)
<i>Different religion (from Mainland)</i>				1.38 (1.01)
<i>Mainlands's variables</i>				
<i>Log GDP per capita</i>	0.64 (0.49)	0.15 (0.60)	0.45 (0.53)	
<i>Log Population</i>	0.20 (0.35)	-0.09 (0.36)	0.34 (0.32)	1.60*** (0.46)
<i>Growth</i>			-0.08 (0.07)	0.09 (0.07)
<i>Lack of Civil Liberties</i>		1.67 (1.53)	-1.38 (1.84)	7.71** (3.22)
<i>Lack of Civil Squared</i>		-0.26 (0.19)	0.10 (0.24)	-1.54*** (0.54)
<i>Ethnic</i>			3.80 (3.29)	9.64*** (3.54)
<i>Linguistic</i>			1.12 (2.86)	-14.22** (5.56)
<i>Religious</i>			-1.08 (2.20)	8.93** (3.70)
<i>Gini Index</i>				0.39*** -0.12
<i>Constant</i>	3.77 (8.35)	7.00 (8.96)	-1.09 (10.96)	-49.54*** (14.56)
<i>Observations</i>	30	30	29	28
<i>Pseudo R-squared</i>	0.03	0.04	0.11	0.17

<sup>1</sup> incidents with fatalities

<sup>2</sup>Relative GDP per capita =GDP per capita of mainland/ GDP per capita of separatist area

Standard errors in parentheses

\* significant at 10%, \*\* significant at 5%; \*\*\*significant at 1%

## APPENDIX

*Table A1: Countries included in the sample*

Afghanistan	Fiji	Morocco	Zambia
Albania	Finland	Mozambique	Zimbabwe
Algeria	France	Namibia	Ukraine
Angola	Gabon	Nepal	United Arab Emirates
Argentina	Georgia	Netherlands	United Kingdom
Armenia	Germany	New Zealand	United States
Australia	Ghana	Nicaragua	Uruguay
Austria	Greece	Niger	Uzbekistan
Azerbaijan	Grenada	Nigeria	Venezuela
Bahamas	Guatemala	Norway	Vietnam
Bahrain	Guinea	Pakistan	Yemen
Bangladesh	Guyana	Panama	
Barbados	Haiti	Papua New Guinea	
Belarus	Honduras	Paraguay	
Belgium	Hungary	Peru	
Belize	Iceland	Philippines	
Benin	India	Poland	
Bolivia	Indonesia	Portugal	
Bosnia and Herzegovina	Iran	Qatar	
Botswana	Iraq	Romania	
Brazil	Ireland	Russia	
Bulgaria	Israel	Rwanda	
Burma (Myanmar)	Italy	Saudi Arabia	
Burundi	Jamaica	Senegal	
Cambodia	Japan	Serbia and Montenegro	
Canada	Jordan	Sierra Leone	
Central African Republic	Kazakhstan	Singapore	
Chad	Kenya	Slovakia	
Chile	Korea, South	Slovenia	
China	Kuwait	Somalia	
Colombia	Kyrgyzstan	South Africa	
Democratic Republic of Congo	Laos	Spain	
Republic of Congo	Latvia	Sri Lanka	
Costa Rica	Lebanon	Sudan	
Cote d'Ivoire	Lesotho	Suriname	
Croatia	Liberia	Swaziland	
Cuba	Libya	Sweden	
Cyprus	Lithuania	Switzerland	
Czech Republic	Luxembourg	Syria	
Denmark	Macedonia	Tajikistan	
Djibouti	Madagascar	Tanzania	
Dominican Republic	Malaysia	Thailand	
Ecuador	Maldives	Togo	
Egypt	Mali	Trinidad and Tobago	
El Salvador	Malta	Tunisia	
Eritrea	Mauritania	Turkey	
Estonia	Mexico	Turkmenistan	
Ethiopia	Mongolia	Uganda	

**Table A2: Total Number of Terrorist Incidents in Different Regions, 1998-2006**

Regions	All	International	Domestic	Separatist
Africa	417	117	281	7
East & Central Asia	128	31	93	4
Eastern Europe	1348	106	620	615
Latin America & the Caribbean	1771	146	1622	3
Middle East / Persian Gulf	11443	800	7591	3041
North America	120	72	48	0
South Asia	4457	330	2443	1662
Southeast Asia & Oceania	1466	99	492	870
Western Europe	3037	240	579	2191
Total	24187	1941	13769	8393

Source: MIPT data set and author's categorization

**Table A3: Number of Incidents: International, Domestic, Separatist**

		All	International	Domestic	Separatist
1972-2006	Number of Incidents	31449	8847	13763	8737
	Percentage	100	0.28	0.44	0.28
1998-2006	Number of Incidents	24023	1907	13763	8277
	Percentage	100	0.08	0.57	0.35

Source: MIPT data set and author's categorization

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**Table A4: Top 10 Most Common Countries of Terrorist Incidents**

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According to:	Number of Incidents	Number of Fatalities
Top 10 Countries/ Areas that Terrorist Incidents Occur (All Incidents)	Iraq (4842) Kashmir (732) Colombia (507) Afghanistan (454) Thailand (392) India (361) Pakistan (295) West Bank (291) Turkey (163) Israel (147)	Iraq (18768) United States (2996) India (1597) Kashmir (1582) Afghanistan (1505) Colombia (1451) Russia (1369) Pakistan (1293) Algeria (874) Israel (755)
Top 10 Countries/ Areas of Terrorist's Origin in International Incidents	Iraq (253) Afghanistan (94) Pakistan (30) Unknown (20) Saudi Arabia (16) Colombia (15) Uganda (10) West Bank (10) Lebanon (10) Indonesia (9) Philippines (8)	Afghanistan (3502) Iraq (1077) Chechnya (263) Kenya (226) Pakistan (140) Uganda (132) Egypt (74) Unknown (57) West Bank (56) Angola (41) Malaysia (39)
Top 10 Target Countries in International Incidents	United States (154)  Turkey (70) Unknown (42) United Kingdom (38) International Org. (30) Pakistan (28) India (22) Israel (16) Iran (14) Russia (13) Germany (12) Egypt (10)	United States (4037) (2982 of it in Sept.11 2001) Russia (283) Unknown (256) Spain (223) United Kingdom (139) International Org. (133) Turkey (126) Israel (107) Pakistan (99) India (79) Sudan (72) Jordan (45)

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Source: MIPT data set 1998-2006 according to author's categorization

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**Table A5: Separatist Terrorist Incidents in the World**

<i>Separatist Regions</i>	<i>Mainland</i>	<i>Incidents</i>	<i>Incidents with Fatalities</i>	<i>Fatalities</i>
Abkhazia	Georgia	49	17	37
Aceh	Indonesia	33	12	58
Achik Land	India	2	0	0
Assam	India	182	74	321
Basque Area	Spain	854	42	55
Basque Area	France	33	1	1
Britanny	France	18	0	0
Catalonia	Spain	6	0	0
Chechnya	Russia	294	111	903
Corsica	France	500	7	10
Dagestan	Russia	74	26	288
East Timor	Indonesia	2	2	2
Ingushetia	Russia	23	8	11
Kashmir	India	1041	704	1441
Kayin State	Burma (Myanmar)	6	4	35
Kosovo	Serbia and Montenegro	117	29	39
Kuki	India	4	2	2
South Eastern Turkey	Turkey	254	84	199
Manipur	India	10	3	15
North Ossetia	Russia	7	1	1
Northern Ireland	United Kingdom	622	27	58
Oromo	Ethiopia	7	4	6
Sardinia	Italy	1	0	0
South Maluku	Indonesia	1	1	4
Southern Philippines	Philippines	64	31	259
Southern Thailand	Thailand	765	325	423
Tamil	Sri Lanka	234	125	515
Tibet	China	2	0	0
Tripura	India	47	31	130
West Bank/Gaza	Israel	2551	387	1137
Xinjiang	China	5	4	53

Source: MIPT data and author's categorization