Annals of Operations Research (2019) 275:623–651
https://doi.org/10.1007/s10479-018-2959-z

ORIGINAL RESEARCH

Civil Liberties and Terrorism in Middle East, North Africa, Afghanistan, and Pakistan

Jomon A. Paul[1] · **Aniruddha Bagchi**[1]

Published online: 10 July 2018

Abstract
This article investigates impact of the lack of civil liberties on terrorism in Middle Eastern and North African countries based on terrorism incidents per capita for the period 1998–2010. We control for endogeneity by using oil revenue, military expenditure and under-five mortality rate as instruments and find that we cannot reject the null hypothesis that civil liberties is exogenous. Our findings from exogenous models indicate that an improvement of civil liberties reduces domestic terrorism but not transnational terrorism. Apart from civil liberties, there is also evidence that rule of law decreases domestic terrorism. We also find that political stability reduces transnational terrorism.

Keywords Civil liberties · Domestic and transnational terrorism · Oil revenue · Military expenditure · Under-five mortality rate

1 Introduction

Researchers have recently been interested in finding out the determinants of terrorism, a common form of political violence with significant human and economic costs to the international community. However, consensus on the possible causes is remarkably lacking.

One strand of research has found that terrorism is less of a problem in autocracies. For instance, Hamilton and Hamilton (1983) show that countries that are poor, autocratic, or have repressive environments are more effective in reversing terrorism than affluent democratic nations that generally have a more conducive environment to accomplish moderate reform. Pape (2003) focuses on suicide terrorism and shows that democracies are more vulnerable than authoritarian governments. This is primarily due to the fact that democracies tend to be viewed as soft targets. Further, countries undergoing transition from authoritarian regimes to democracies tend to see an increase in terrorism incidents (Abadie 2006; Kurrild-Klitgaard

✉ Jomon A. Paul
jpaul17@kennesaw.edu

Aniruddha Bagchi
abagchi@kennesaw.edu

[1] Department of Economics, Finance, and Quantitative Analysis, Kennesaw State University, 560 Parliament Garden Way, Kennesaw, GA 30144, USA

et al. 2006; Chenoweth 2010; de la Calle and Sánchez-Cuenca 2012; Piazza 2013). Piazza (2008) demonstrates that promotion of democracy and free market economic reforms do not necessarily have a positive impact on terrorism.

Another strand of research has found that terrorism is less of a problem in democracies. For example, Eyerman (1998) finds that established democracies are less likely to face terrorism than non-democracies and that newly formed democracies are more vulnerable to terrorism than other types of states. Li (2005) finds that democratic environment increases satisfaction and political efficacy of citizens. It helps reduce their grievances and helps deter terrorist recruitment and increases public tolerance toward counterterrorism policies. This positive relationship between democracies and transnational terrorism is significantly impacted by institutional constraints placed over the government. Testas (2004) shows that repression decreases terrorism in the short run but not in the long run. This suggests that a democratic environment would help curb the risk of terrorism. Abrahms (2007) finds that the world's most illiberal states are disproportionately targeted by terrorists.

There is also a third strand of the literature that finds that the relationship between regime type and terrorism depends upon the policies pursued by the regime. For example, Savun and Phillips (2009) show that the positive empirical association between democracy and transnational terrorism is explained by the foreign policy behavior of states and is not impacted by regime type. States with more active foreign policies are likely to generate resentment among foreign groups and, hence, may be the target of terrorism by these aggrieved groups. Similarly, Lutz and Lutz (2010) find that while social freedoms are important, terrorism is more likely under a democracy. Kis-Katos et al. (2011) find that failing states serve as the primary breeding ground for terrorism. In a recent paper, Wilson and Piazza (2013) show that single-party autocracies suffer from less terrorist attacks than either democracies or military autocracies.

In addition to mixed views noted above on the impact of democracy on terrorism, some nations and regions seem to be more vulnerable on this issue or rather provide a more fertile ground than others (see Global Terrorism Database 2013). Empirical research investigating the impact of civil liberties on terrorism in an endogenous framework is lacking as well. Thus there are several unresolved issues. A better understanding of this issue would aid policy makers figure out how to effectively combat terrorism. This article takes a closer look at the relationship between domestic and transnational terrorism and elements of democracy in the MENAP Region (Middle East, North Africa, Afghanistan and Pakistan). The list of countries in this region is defined in the World Economic Outlook database by International Monetary Fund (International Monetary Fund 2013) and is presented in Table 1.

We focus on this group of nations as they have been shown to pose the greatest concern in global terrorism on several counts, such as the number of attacks, number of terrorist groups, and number of affected countries (United States Department of State 2014; Global Terrorism Database 2013). As one attempts to determine possible reasons behind such disturbing and alarming facts, it is hard to ignore the lack of civil liberties in these nations (Pew Attitudes Global Research Project 2013). While this does not necessarily imply that one causes the other, it is worthwhile to investigate this comprehensively given the high stakes involved. We discuss this in detail in Sect. 3 focusing on exposition of the primary hypothesis of our study.

In this article, we analyze the impact of civil liberties on domestic and transnational terrorism in both an exogenous and an endogenous setup. Our main result is that a reduction in civil liberties leads to an increase in domestic terrorism but it has a statistically insignificant impact on transnational terrorism. To control potential endogeneity issues with civil liberties, we use three instrumental variables: oil revenue, military expenditure and under-five mortality

Table 1 List of countries in MENAP

ID	Countries
1	Afghanistan
2	Algeria
3	Bahrain*
4	Djibouti
5	Egypt
6	Iran
7	Iraq
8	Israel
9	Jordan
10	Kuwait
11	Lebanon
12	Libya
13	Malta*
14	Morocco
15	Oman
16	Pakistan
17	Qatar
18	Saudi Arabia
19	Syria
20	Tunisia
21	United Arab Emirates
22	West Bank and Gaza*
23	Yemen*

Due to data limitations, we had to drop four countries (in asterisks) from our sample

rate. We discuss the rationale for their choice in detail in Sect. 5. We find that find that we cannot reject the null hypothesis that civil liberties is exogenous.

We also find that the frequency of domestic terrorist attacks per capita (our dependent variable of interest) depends negatively (i.e. as these factors increase, terrorism incidents per capita go down) on factors such as rule of law and positively on governance indicators such as voice and accountability and regulatory quality. Transnational terrorism on the other hand depends negatively on political stability and positively on religious fractionalization.

The rest of this article is organized as follows: Sect. 2 presents our literature review. Section 3 provides our theoretical argument and presents the primary hypothesis of our study. Section 4 describes our data. Section 5 describes the empirical methodology we employ. Section 6 shares our model results. We conclude in Sect. 7.

2 Literature review

Our review of the literature focuses on two aspects of research on terrorism: determinants of terrorism and impact of democracy on terrorism.

Enders and Sandler (2006) find evidence of transference of terror attacks on US interests from US soil to other regions. Among others they also find that democratic institutions hinder political leaders from implementing timely and effective preventive measures against

potential terrorist threats. Krueger and Laitin (2008) find that richer nations are more likely to be targets, while politically repressed nations to be the sources of transnational terrorism. On the other hand, Abadie (2006) finds that terrorism is not directly affected by economic variables, but it has a significant non-monotonic relationship with political freedom. Eubank and Weinberg (1994) provide evidence that liberal democratic countries, because of their structural mandate to preserve entrenched liberties, host more terrorist organizations than authoritarian countries. This leads one to presume that democracies will experience more terrorist attacks than autocracies as a result of the presence of widespread individual freedoms that allow terrorist groups to recruit, train, and mobilize more freely.

Savun and Phillips (2009) show that states whose foreign policy entails active participation in international politics are resented abroad and are more likely to be targets of transnational terrorism. This is particularly relevant for the United States. U.S. Foreign Policy has sometimes been supportive of dictators in the MENAP region to gain unparalleled access to this region's oil resources which would not be possible in a democratic regime who are accountable to their citizens (Monshipouri 2002). This consequently has alienated the population in this region and fostered heightened hatred towards United States. According to the Government Accountability Office report of 2005 (p. 9), "…extremists have targeted the United States because of a belief that the United States supports authoritarian governments in the Middle East while promoting democracy elsewhere." The extent of alienation is abundantly clear from the results of Pew Attitude Surveys (Pew Research Global Attitudes Project 2013) from MENAP countries (see Fig. 1). Another survey reveals more worrisome findings in that the citizens of these nations believe that attacks against US and other westerners are justifiable (see Fig. 2). Such sentiments and alienation could manifest in the form of donations to terror networks and also could aid recruitment efforts of such extremist organizations.

Ross (1993) and Eyerman (1998) claim that democracies provide citizens with various nonviolent means to resolve disputes and are therefore less vulnerable to terrorism. Consistent with this line of reasoning, Eyerman (1998) finds that mature democracies, on average, attract fewer terrorist attacks than nondemocracies, though nascent democracies are more likely to experience terrorism. Li (2005) shows that citizens of democracies are unlikely to resort to terrorist acts because they enjoy opportunities for political participation. Conversely, when democratic legislatures and judiciaries constrain the executive's policy options in response to terrorist threats, or when the free mass media in democratic societies are easily accessible to terrorists as outlets for political propaganda and mobilization, the number of terrorist activities is likely to increase in these countries. Choi (2010) finds that, a sound rule of law noted in democratic nations reduces instances of terrorism.

3 Primary hypothesis

Following Enders and Sandler (2002), terrorism is defined to be the premeditated or threatened use of extra-normal violence or force to obtain a political, religious, or ideological objective through the intimidation of a large audience. Given our focus on finding the root causes of terrorism, we focus on both domestic and transnational terror. Domestic terrorism involves violence against the civilian population or infrastructure of a nation often but not always by citizens of that nation and with the intent to intimidate or influence national policy (RAND 2013). In contrast, transnational terrorism involves victims, perpetrators, targets, or institutions of another country (Li 2005). These could involve attacks initiated by foreign terrorists against some domestic target in a country, attacks by domestic terrorists against

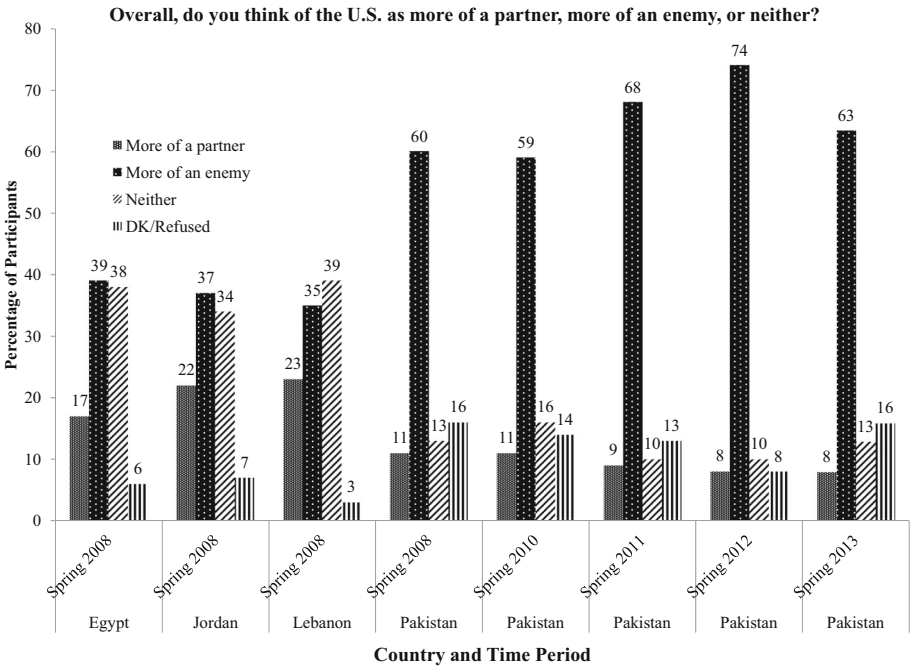

Fig. 1 Pew attitude survey about US role (MENAP)

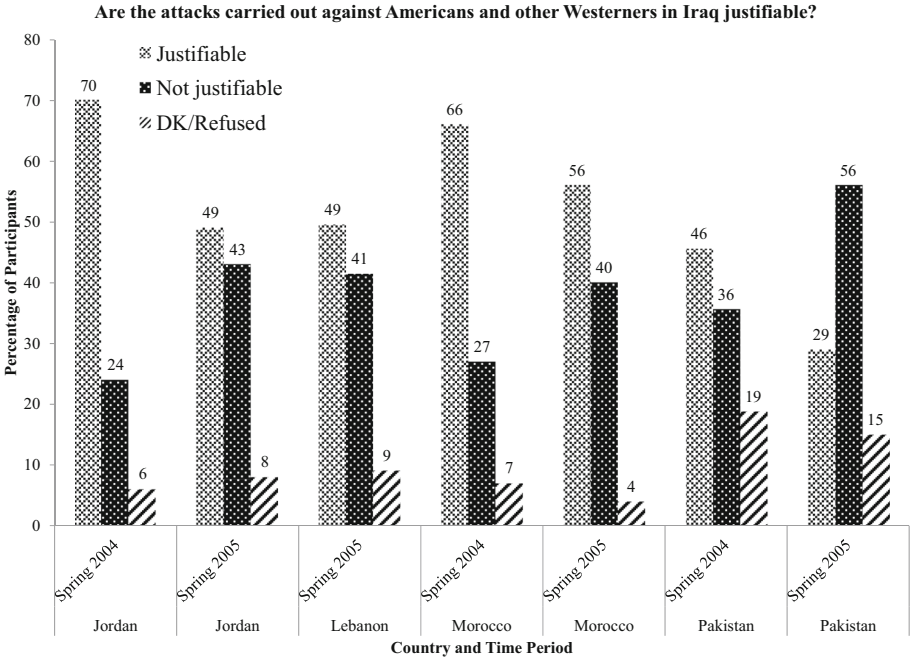

Fig. 2 Pew attitude survey about attacks on Americans and westerners (MENAP)

some foreign target in a country, or attacks by foreign terrorists against some other foreign target in a country.

3.1 Impact of civil liberties

There is conflicting evidence on the impact of civil liberties on terrorism. One argument claims that civil liberties do not have a significant impact on terrorism in a country. Instead, the primary reason for terrorism is ethnic polarization that arises as a result of competition for economic resources among ethnic groups. Therefore, a country with minority groups that do not enjoy the same economic freedoms as the majority serves as a breeding ground for terrorists (Basuchoudhary and Shughart 2010).

A second argument in the literature claims that democracies suffer more from terrorism. The notion is that citizens in democratic societies enjoy more rights than under autocratic regimes, and this provides an opportunity for terrorists to become organized and operate easily (Hamilton and Hamilton 1983; Ross 1993; Eyerman 1998; Engene 2004). Further, expansive and secure civil liberties make it difficult for the legal systems in democracies to punish terrorists and for democratic governments to prevent or strike back against terrorism (Schmid 1992; Eubank and Weinberg 1994, 2001). All of these imply that civil liberties are positively associated with terrorist attacks since higher degree of liberties are usually observed in democracies.

There is also a contrarian view in the literature that concludes that civil liberties are negatively related to terrorism. Krueger and Maleckova (2003) show that civil liberties rather than education and poverty is significantly related to terrorism and that countries with reduced civil liberties are more likely to be a source of terrorists. Similarly, Kurrild-Klitgaard et al. (2006) show that higher the extent of civil liberties and the more trade oriented a country's economy, the less likely it is that the country will produce terrorists. Krueger and Laitin (2008) find that countries with a lower level of civil liberties have a higher participation rate in terrorism on average, and therefore there is reason to believe that civil liberties generate a mitigating effect on terrorism. If citizens enjoy more civil liberties, they are more likely to influence the political process successfully and this mitigates political grievances and helps reduce terrorist activities. Gassebner and Luechinger (2011) perform Extreme Bounds Analysis on several variables that are commonly thought to be determinants of terrorism. The purpose of their study is to determine the most robust variables from this list. Their study indicates that civil liberties is negatively related with terrorism.

An important paper to consider in this regard is Li (2005). He points out that the strong correlation between democracies and terrorism may simply be an instance of measurement error because of reporting bias in the media. Democracies impose fewer restrictions on the media and therefore it is more likely that terrorist attacks are more extensively reported in these countries. Therefore, the apparently high incidence of terrorist attacks in democracies may simply be an artifact of their free media. Further, one major motivation of terrorists is to seek attention. Since this purpose is easily served in democracies by the free media, therefore, it is possible for democracies to attract terrorist attacks.

At the minimum, it seems that *civil liberties have a non-trivial impact on terrorism.* However, the actual direction of the relationship is far from clear and can only be resolved empirically. One point to keep in mind is that there are significant variations between different regions of the world and as a result, the conclusions may vary from one region to another. For instance, motivations behind terrorism in countries such as Israel and Palestine are primarily political (conflict over land) and social (Israel is the only non-Islamic country in the Middle

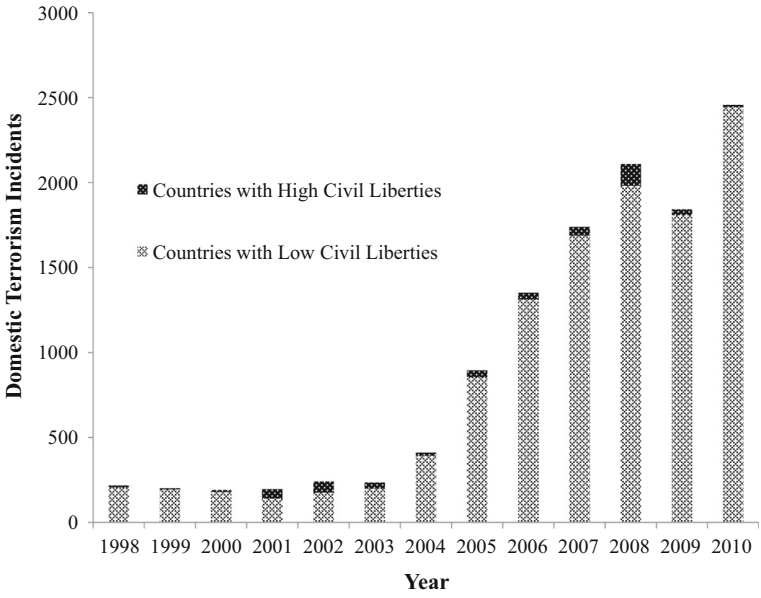

Fig. 3 Domestic terror incidents versus civil liberties in MENAP countries

East) whereas the elitist terrorist movements in Europe in the late 60s and early 80s were motivated predominantly by economic reasons (Crenshaw 1981). The focus of our study is the MENAP countries and we seek to unravel the relationship between civil liberties and terrorism in this region.

Based on our preliminary data analysis (see Fig. 3) comparing countries with less civil liberties with those with more civil liberties, it follows that in the MENAP countries domestic terrorist attacks occur predominantly in countries with low civil liberties (or where repression is extremely high).[1] This seems to be more consistent with the view that there is a negative relationship between civil liberties and terrorism (i.e., as civil liberties improve, the incidence of terrorism goes down).[2,3] However, in order to draw a more definitive conclusion, a detailed analysis is warranted. Following the literature, we consider model specifications with a host of relevant regressors. In addition to considering relevant regressors, any analysis performed would not be complete unless it also controls for endogeneity issues that are associated with civil liberties, a problem often reported in research articles studying root causes of terrorism (Abadie 2006; Bandyopadhyay and Younas 2011). Failing to treat civil liberties as an endogenous variable could bias the estimated effects of civil liberties if it is indeed endogenously determined. Finally, given the substantial variation noted in civil liberties for the countries considered in this study during 1998–2010 time period (see Table 2), it is

[1] In the original data by Freedom House, a larger value for civil liberties represents less liberty (and not more as one would expect). This creates a potential problem with interpretation of the results. To get around this problem, we measure civil liberties by the negative of the value reported by Freedom House. Further, for Fig. 3, we classify a country as having low civil liberties if its civil liberties score is less than -4. Other countries are classified as having high civil liberties.

[2] We only present the domestic case here but would like to point out that a similar relational nature holds true for the transnational incidents as well.

[3] This trend holds for domestic incidents per capita, dependent variable in our modeling specifications. We elaborate on this variable in Sect. 4.

Table 2 Distribution of civil liberties in MENAP

Country	Mean	SD
Afghanistan	−6.077	0.760
Algeria	−5.077	0.277
Djibouti	−5.231	0.439
Egypt	−5.385	0.506
Iran	−6.077	0.277
Iraq	−6.154	0.801
Israel	−2.462	0.519
Jordan	−4.538	0.519
Kuwait	−4.692	0.480
Lebanon	−4.385	0.768
Libya	−7.000	0.000
Morocco	−4.308	0.480
Oman	−5.231	0.439
Pakistan	−5.000	0.000
Qatar	−5.462	0.519
Saudi Arabia	−6.538	0.519
Syria	−6.615	0.506
Tunisia	−5.000	0.000
United Arab Emirates	−5.231	0.439

plausible that civil liberties can causally induce variations in the number of terrorist acts. The above aspects form the motivation of discussion in the sections that follow. Our primary research question that we investigate in this article is as follows.

Hypothesis 1 Increased civil liberties reduce both domestic and transnational terrorism in MENAP countries.

4 Description of data

In this paper, we use data from the Global Terrorism Database (GTD). We extract information about terrorist incidents in the MENAP countries (listed in Table 1) for the years 1998 through 2010. While there are different ways of measuring terrorism such as number of casualties, property damage, incident count, etc., we focus our attention on the number of terrorist incidents per capita as this has been suggested as a more accurate way of measuring risk than just total count or total damage (Jetter and Stadelmann 2017). Specifically, we focus on domestic and transnational incidents per 100,000 population as our dependent variables. For brevity, from here on we will refer to these variables on a per capita basis. Next, we describe our methodology regarding how an incident is characterized as either a domestic or transnational incident.

Sometimes, it is difficult to separate criminal activities or political violence from terrorist attacks. If there is any doubt about whether or not an attack is an act of terrorism, then the database explicitly mentions that. We drop these doubtful observations from our sample.

The next step is to classify each terrorist attack as domestic or transnational. In principle, a terrorist attack can be classified as transnational based upon any of the following three

criteria: (i) The perpetrator and the victim have different nationalities, (ii) the perpetrator's nationality is different from the country in which the attack occurs, and (iii) the victim's nationality is different from the country in which the attack occurs. The GTD database has created a variable called INT_ANY that takes a value 1 if an attack has any of the above mentioned three elements present, 0 if none of these elements are present and −9 otherwise. We classify any attack as transnational if the variable INT_ANY takes a value of 1. All other incidents are classified as domestic.

There are some issues about transnational terrorism that we would like to clarify. For example, papers such as Krueger and Maleckova (2003) and Kis-Katos et al. (2011) examine the factors that cause a nation to be the source of terrorism. Then there are other papers such as Tavares (2004), and Li (2005) that examine factors that make a nation a target of terrorism. Finally, there is a third strand of research such as Kurrild-Klitgaard et al. (2006) that look at both kinds of countries- the source as well as the target.

In their paper on the determinants of transnational terrorism, Krieger and Meierrieks (2011) conclude that everything else remaining constant, a country that is economically successful and politically open is more likely to be a target of transnational terrorism.

In this paper we consider two kinds of transnational attacks. First involves attacks against foreign nationals in a country. In several MENAP countries, foreign militaries have been used either to stabilize a country or to assist its government. If a country has a poor record of civil liberties, then terrorist groups operating in that country may choose to attack foreign militaries in order to force them to leave so that the government can be overthrown. In addition to militaries, international aid agencies and foreign businesses are also targeted by terrorists. Our count of transnational attacks also includes attacks by foreign terrorist groups. We explain the motivation behind these attacks as follows: Consider a community (such as an ethnic or a religious group) X that resides in two countries-1 and 2. Further, assume that there are grievances (such as lack of civil liberties) amongst members of X in country 2. Now suppose there is a terrorist group based principally in country 1 but that claims to represent the interests of the whole community X. In such a case, country 2 will be vulnerable to terrorist attacks from country 1 because of two reasons. First, the terrorist group would consider fighting the government of country 2 as a legitimate objective because it represents the whole community. The second reason is that terrorist attacks often depend upon internal help (such as accurate information) for its success.

We present the annual total, domestic and transnational terrorist incidents (per capita) for the MENAP countries in Table 3. Domestic terrorism makes up about 70% of the total incidents of terrorism per capita in our study of 23 countries. Therefore, domestic terrorism poses a much bigger challenge for MENAP countries than transnational terrorism.

Our variable descriptions and their type i.e. dependent, independent or instrumental are listed in Table 4. We now briefly discuss the rationale behind choice of variables and what they embody. Our primary variable of interest is civil liberties. As mentioned earlier, in the original data by Freedom House, a larger value for civil liberties represents less liberty which is contrary to usual expectations. In order to simplify the interpretation of results, we measure civil liberties by the negative of the value reported by Freedom House.

We also use three other controls for the political climate of a country: (i) political repression, (ii) polity and (iii) lack of press freedom. Political repression is same as the variable "Political Rights" that is reported by Freedom House. However a higher value of this variable represents a reduction in political rights. Hence, we label this variable as "political repression" for the ease of interpretation. Polity measures the quality of democracy and takes values

Table 3 Terrorism data for MENAP countries (1998–2010)

Years	Total incidents (per 100,000 population)	Domestic incidents (per 100,000 population)	Transnational incidents (per 100,000 population)
1998	1.48	0.66	0.82
1999	1.46	0.61	0.85
2000	1.20	0.78	0.43
2001	1.69	1.02	0.67
2002	1.91	0.92	0.99
2003	1.78	0.87	0.91
2004	2.45	1.60	0.85
2005	4.64	3.39	1.25
2006	6.39	5.44	0.95
2007	7.45	6.49	0.96
2008	10.79	8.83	1.96
2009	9.83	9.31	0.52
2010	10.36	9.34	1.02

between − 10 and + 10, with higher values representing a higher quality of democracy.[4] We control for freedom of the press because of previous findings that more press freedom tends to increase transnational terrorism. Free press in democratic nations provides terrorist groups opportunities to gain publicity for their extremist views by presenting it to a wider audience (Nacos 1994; Li 2005). Such a privilege does not exist in the absence of press freedom.

The second set of controls is World Governance Indicators. The governance indicators that we use are: (i) Voice and Accountability, (ii) Political Stability, (iii) Government Effectiveness, (iv) Regulatory Quality and (v) Rule of Law. These governance indicators control for the quality of institutions. Extant literature has controlled for some of these institutional factors. For instance, Kis-Katos et al. (2011) find that unstable states are associated with more terrorist attacks. A failing state may not be able to police all of its territories effectively and this would facilitate the terrorist groups to operate easily in these areas. Political stability is included in our study as one of the independent variables to control for this effect. Similarly, we include rule of law in our study. This finds support in prior research. Bandyopadhyay and Younas (2011) explicitly control for this and find that better enforcement of the law reduces terrorism. Our view is that the overall quality of governance affects the extent of terrorism. Hence, in addition to these two variables, we also included a few more governance indicators. One problem with using governance indicators is that these are based on perceptions. However, this problem is present in other variables also, particularly those which control the nature of politics, and is an unavoidable issue in this line of research.

We also include indices of ethnic, linguistic, and religious fractionalization to control for the extent of diversity from Alesina et al. (2003). The extent of diversity in a country can lead to friction between different social groups and this may ultimately result in terrorism. A higher value of these indices reflects the probability that two randomly chosen individuals from the same country belong to two different groups. These measures have been used in Tavares (2004), Abadie (2006) and Bandyopadhyay and Younas (2011).

[4] In three kinds of situations, Polity is coded differently. These are: (i) Foreign Interruption (coded as − 66), (ii) Interregnum or Anarchy (coded as − 77), and (iii) Transition (coded as − 88). We view these three situations as reflecting a poor quality of the democracy and use a value of − 10 in each case.

We also consider geographical variables such as (i) land area, (ii) elevation, and (iii) fraction of the country in tropics. This is motivated by the fact that everything else remaining constant, a country will be more vulnerable to terrorist attacks if it has the characteristics of a suitable target. Some of these characteristics in turn depend upon geography. A large country is more vulnerable to attacks because it provides more targets. A mountainous country is harder to police and hence is more vulnerable to terrorist attacks (Abadie 2006). Gaibulloev and Sandler (2013) find that terrorist groups are more likely to survive if they are based in a tropical country.

We control possible endogeneity issues associated with civil liberties with the help of three instrumental variables: oil revenue, military expenditure and lagged under-five mortality rate. We discuss the underlying rationale that motivated their selection in detail in Sect. 5.2.

To the best of our knowledge, there is no single data set that includes all of the variables required for our analysis. Therefore, it was required that the information on these variables be collected from a variety of sources. All variables used in our analysis and their sources are provided in Tables 4 and 5.

There are 23 countries in the MENAP region. Out of these, we had to drop 4 countries (mentioned in Table 1) due to lack of information. Further, data on World Governance Indicators are not available for 2 years-1999 and 2001 and we had to drop these 2 years also. Ultimately, our sample comprises of 19 countries over 11 years, and consequently our maximum sample size is 209. We lost observations due to missing data on variables used in our study including polity (loss of 21 observations), under-five mortality rate (loss of 7 observations), military expenditure (loss of 5 observations) and press freedom (loss of 1 observations). The surviving sample with no missing values for any of the variables has 175 observations with no obvious pattern or bias in the observations removed to raise concerns about the resulting sample. Table 6 provides the summary statistics for this sample.

5 Econometric specifications

5.1 Exogenous models

In this study, we examine the impact of civil liberties on terrorism incidents per capita in MENAP countries. Our period of study is 1998–2010.

We start with a pooled cross-section regression model as follows:

$$y_{it} = \alpha_0 + \alpha_1 \, Civil \; Liberties_{it} + \alpha_2 X_{it} + \varepsilon_{it}, \tag{1}$$

where y_{it} measures terrorism incidents per capita in country i in time period t, Civil Liberties is our key independent variable that measures civil liberties in a country i in time period t, vector X includes other potential predictors of terrorism such as measures of press freedom, religious, linguistic and ethnic fractionalization, country geography, etc., and ε represents the error term. These variables are listed in Table 4 and are motivated by the literature.

In order to tackle the existence of unobserved country heterogeneity, we extend our study by taking advantage of the panel setting of our data. Our model of interest is presented below:

Table 4 Variable description

Variable notations	Definitions	Type	Numeric interpretation
Domestic	Total domestic incidents per 100,000 population	Dependent	
Transnational	Total transnational incidents per 100,000 population	Dependent	
Civil liberties	Extent of civil liberties	Independent	Higher values indicate more civil liberties
Political repression	Extent of political rights	Independent	Higher values indicate more political repression
Polity	A measure of the quality of democracy	Independent	Higher values indicate a better quality of democracy
Voice and accountability	Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media	Independent	Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance
Political stability	Reflects perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism	Independent	Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance
Government effectiveness	Reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies	Independent	Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance
Regulatory quality	Reflects perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development	Independent	Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance
Rule of law	Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence	Independent	Ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance
Lack of Press freedom	Extent of Press freedom	Independent	Higher values indicate less freedom

Table 4 continued

Variable notations	Definitions	Type	Numeric interpretation
Religious fractionalization	Religious fractionalization	Independent	Higher values represent more religious diversity
Ethnic fractionalization	Ethnic fractionalization	Independent	Higher values represent more ethnic diversity
Language fractionalization	Language fractionalization	Independent	Higher values represent more linguistic diversity
Ln(area km sq.)	Natural log of land area in square km	Independent	
Ln(elevation)	Natural log of elevation	Independent	
Tropical area	% land area in geographical tropics	Independent	
Oil revenue	Oil revenue	Instrumental	
Military expenditure	Military expenditure	Instrumental	
Under-five mortality rate	Infant mortality rate	Instrumental	

Table 5 Variable data sources

No.	Variables	Data source
1.	Incidents	Global Terrorism Database
2.	Civil liberties	Freedom House
3.	Political repression (political rights)	Freedom House
4.	World governance indicators:	World Bank
	Voice and accountability	
	Political stability	
	Government effectiveness	
	Regulatory quality	
	Rule of law	
5.	Fractionalization variables	Norwegian Social Sciences
		Data Services
6.	Geographical variables	Center for International
		Development, Harvard
7.	Polity	Center for Systemic Peace
8.	(Lack of) press freedom	Freedom House
9.	Price of oil/oil assets	British Petroleum
10.	Quantity of oil exports	US Energy Information Administration
11.	Under-five mortality rate (5 years and under)	World Bank
12.	Military expenditure	World Bank

Table 6 Summary statistics for variables

Variables	Sample (n = 175)	
	Mean	SD
Dependent variables		
Transnational incidents (per 100,000 population)	0.056	(0.131)
Domestic incidents (per 100,000 population)	0.266	(0.844)
Independent variables		
Civil liberties	− 5.086	(1.103)
Polity	− 4.011	(5.636)
Political repression	5.423	(1.428)
Rule of law	− 0.23	(0.764)
Voice and accountability	− 0.89	(0.567)
Regulatory quality	− 0.328	(0.76)
Government effectiveness	− 0.218	(0.675)
Political stability	− 0.619	(1.023)
Lack of press freedom	66.451	(14.381)
Ethnic fractionalization	0.476	(0.243)
Religious fractionalization	0.245	(0.238)
Linguistic fractionalization	0.354	(0.249)
Ln (country area)	12.297	(1.889)
Tropical area	0.171	(0.313)
Ln (elevation)	6.156	(0.954)
Instrumental variables		
Oil revenue ($ millions)	17,600	(35,500)
Military expenditure ($ millions)	6067.69	(9085.863)
Under-five mortality rate	47.899	(30.182)

$$y_{it} = \alpha_0 + \alpha_1 \, Civil \, Liberties_{it} + \alpha_2 X_{it} + \tau_i + \varepsilon_{it}, \tag{2}$$

where τ_i represents time invariant unobserved country heterogeneity. If we assume there is no correlation between τ_i and the observables, we can use the Random Effect (RE) model to estimate the effects of civil liberties. Since we cannot rule out the possibility that the unobserved heterogeneity could be correlated with some observables, we further relax the assumption by allowing the existence of arbitrary relationship between τ_i and the observables where we use the Fixed Effect (FE) model instead. We use a Breusch-Pagan Test to check the existence of this unobserved heterogeneity by comparing the RE model with the pooled cross sectional one, and then use a Hausman type of test to compare our estimation results from our RE and FE models.

5.2 Instrumental variables

A concern is that civil liberties is an endogenous variable, and this issue has been raised in Abadie (2006) and Bandyopadhyay and Younas (2011). One possible explanation is the problem of simultaneity. On the one hand, lack of civil liberties can induce the citizens of a country to resort to terrorism in order to fight for their rights. However, on the other hand, it is also possible that terrorism may lead governments to take actions that may alter the degree of civil liberties that citizens enjoy. On some occasions, a government might want to curb civil liberties in order to fight terrorism, while on other occasions a government might compromise and allow more civil liberties. Thus, the net effect of this reverse causality (that is, of terrorism on civil liberties) in general is not clear. Thus, we cannot rule out the possibility that the Civil Liberties is correlated with the error term (i.e., is an endogenous variable) in Eqs. (1) and (2) without testing for it. If this is true, then we may end up with biased estimates of Civil Liberty effects if we fail to tackle this issue appropriately. Therefore, we first use a two-stage least squares (2SLS) model to estimate the effects of the civil liberties treating it as endogenous. We then use the Durbin–Wu test to investigate whether we have strong empirical evidence to believe that the civil liberties should indeed be treated as an endogenous variable. The 2SLS estimation is done using the following specifications:

Stage one:

$$Civil\ Liberties_{it} = \theta_0 + \theta_1 X_{it} + \theta_2 IV_{it} + \vartheta_{it} \tag{3}$$

Stage two:

$$y_{it} = \gamma_0 + \gamma_1\ \widehat{Civil\ Liberties}_{it} + \gamma_2 X_{it} + \mu_{it} \tag{4}$$

In the first stage, we estimate the country's civil liberties as a function of Instrumental Variables (IVs) and other covariates. And in the second stage, we estimate the terrorism incidents per capita as a function of the estimated civil liberties from the first stage and other covariates. Theoretically, we need to include at least one IV for each endogenous variable in order to identify the model. In order to control for endogeneity, we introduce three intuitive instruments: oil revenue, under-five mortality rate and military expenditure as IVs.

5.2.1 Oil revenue and civil liberties

Most of the MENAP countries are autocracies and in many of these countries, the principal asset is oil, which is controlled primarily by the rulers. For example, in Saudi Arabia oil revenue amounts for 80–90% of overall state revenues and 40–50% of GDP in recent years (US Energy Information Administration 2013). Similarly, as of 2010, oil revenues provided Iran with approximately half of the government's revenues and there are not many other avenues of meaningful employment or exports.

Below, we examine if there is any plausible reason to believe that oil revenues in the MENAP region is associated with a lack of civil liberties there. First, let us consider the data. It follows from Fig. 4 that there was a surge in oil revenue in MENAP countries during our period of analysis. It also follows from Table 3 that this trend coincides with the surge in terrorism.

We argue below that oil revenue can have both a positive as well as a negative effect on civil liberties. There are some papers that discuss why more oil revenues lead to a reduction of civil liberties and we discuss them first.

Karl (1997) argues that since governments of such economies depend on oil income as the primary source of government revenue instead of taxes, the state loses its ability to make

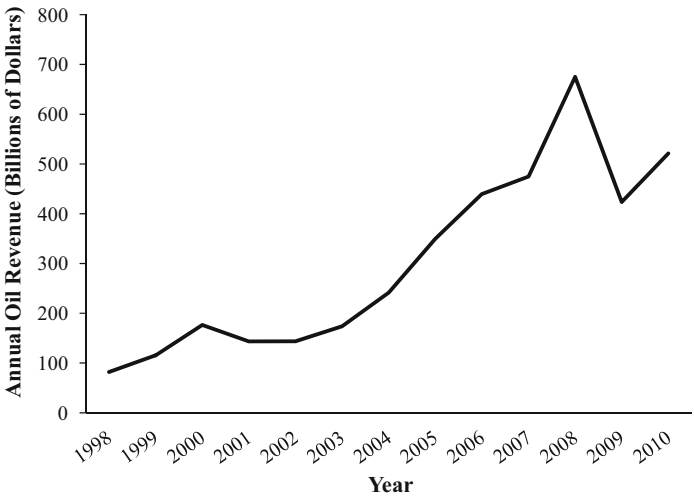

Fig. 4 Annual oil revenue in MENAP (1998–2010). *Source*: US Department of Energy

sound economic regulatory decisions since it governs via public expenditure instead of smart management of the economy. Therefore high oil revenues lead to *regulatory failure*. One manifestation of regulatory failure is crony capitalism, in which case the government adopts policies that favor business groups with ties to the regime. For example, a recent article by Bozorgmehr (2013) in Financial Times mentions that the Iranian regime deliberately follows policies to stunt the growth of private businesses in an effort to prevent an independent private sector from using its wealth to destabilize the regime. Our results indicate that regulatory quality is positively associated with terrorism. This is because policies that apparently promote the private sector are effectively implemented in a manner that favors some business groups at the expense of others. Such policies are feasible in many MENAP countries because the government does not depend on the private sector for tax revenues. Therefore, oil revenue allows dictatorial regimes to restrict the right to pursue one's livelihood.

Ross (2009) empirically establishes the causal link between oil wealth and authoritarianism through the *rentier* effect. The rentier effect is the observation that governments of oil rich countries use low tax rates and high spending to dampen pressures for democracy. There are three channels through which this effect works. First, governments of such countries spend a part of their oil wealth to buy support. Second, these governments reduce the tax burden of their citizens because they can finance the operations of the state using their oil revenues. Third, the rulers use their influence to hinder the formation of social organizations that might ultimately challenge them. The outcome of the rentier effect is that it sustains dictatorial regimes, which then curbs civil liberties.

It is however possible for oil revenues to exert a positive influence on civil liberties. Oil revenues allow the government of a country with the funds needed to develop infrastructure and take other measures to improve the quality of life of its citizens. In that case, the likelihood of a rebellion will be low and therefore the government will not have to reduce civil liberties in order to control the unrest.

This leads to the second research question we focus on in this study.

Hypothesis 2 The relationship between oil revenue and civil liberties can go either way.

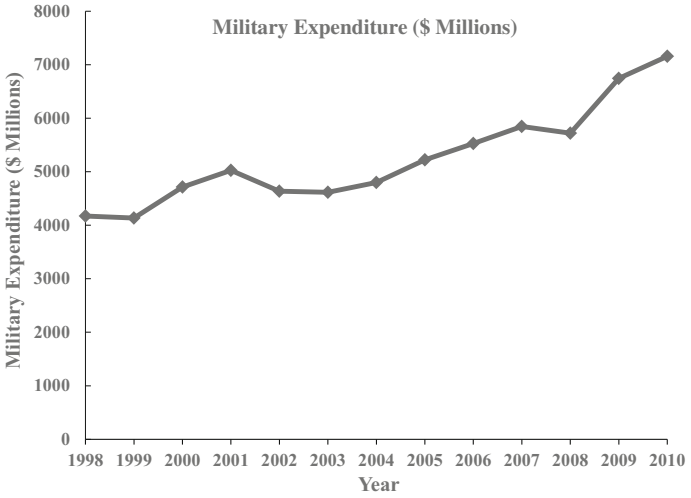

Fig. 5 Military expenditure in MENAP (1998–2010). *Source*: World Bank

Now let us consider the direct relationship between oil revenue and terrorism (of both kinds). In our sample, we find that the relationship between domestic terrorism and oil revenue is not significant (correlation coefficient = 0.08) even at 10% level of significance. The same holds for the relationship between transnational terrorism and oil revenue (correlation coefficient = −0.04). Further, we regress the number of terrorist attacks on civil liberties and oil revenue and find that the coefficient of oil revenue is statistically insignificant. This indicates that oil revenue does not have a significant direct effect on terrorism.

5.2.2 Military expenditure and civil liberties

Below, we examine if there is any plausible reason to believe that military expenditure in the MENAP region is associated with civil liberties. First, let us consider the data. It follows from Fig. 5 that there was a surge in military expenditures in MENAP countries during our period of analysis. It also follows from Table 2 that this trend coincides with the surge in terrorism. Below, we first argue why high levels of military expenditure will result in decrease in civil liberties. Then we argue that because of the special context of the MENAP region, there are reasons to believe that military expenditure has an indirect relationship with terrorism through its effect on civil liberties.

As Fig. 6 shows, the MENAP countries on an average spend a larger fraction of their GDP on the military compared with OECD countries. Aizenman and Glick (2006) find that military expenditure reduces growth if its primary motivation is rent-seeking and corruption. Most of the MENAP countries are autocratic regimes. In most if not all such regimes, civil rights are restricted, and the incumbents occasionally resort to plain violence to crush opponents, intimidate potential challengers, or to discipline the population at large. Such a repression of civil liberties can be regarded as a standard instrument of the authoritarian toolbox used to uphold and extend political and social control (Tullock 1987; Wintrobe 1998). This though would lead to unrest among the citizenry. It is rational for the regime to support the military to protect it in the case of an anticipated uprising (e.g., Syria). One

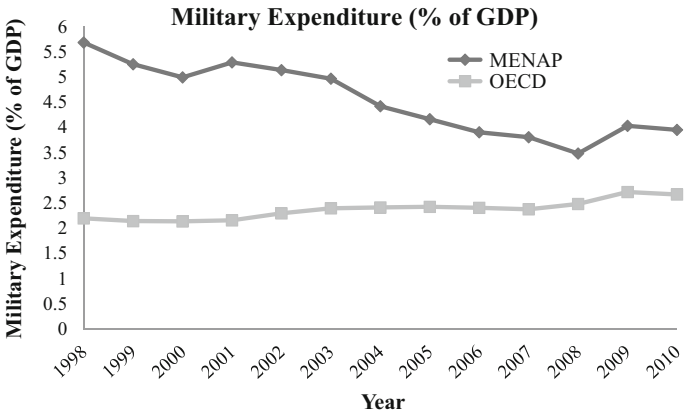

Fig. 6 Military expenditure (% of GDP): MENAP versus OECD (1998–2010)

would therefore expect to find a negative relationship between military expenditure and civil liberties.

This leads to the third research question we focus on in this study.

Hypothesis 3 Military expenditure is negatively related with civil liberties.

Now let us consider the direct relationship between military expenditure and terrorism. We first focus on transnational terrorism. As we discussed in Sect. 4, we consider two kinds of transnational attacks in this study—attacks against foreigners and attacks by foreign terrorist groups with the former much more common in our data. The targets of these attacks are mainly western military personnel. Therefore, it is understandable for the countries (such as USA) under attack to allocated resources aimed at better security for their personnel. However, the military expenditure used in this study features expenditure by the host country for which protecting foreigners is not the primary motivation.[5] Therefore, it is plausible that given the special context of the MENAP region (in which foreign militaries are present in many countries), military expenditure will not have a direct effect on transnational terrorism. Now let us consider military expenditures by host country and its direct effect on domestic terrorism. There is considerable extant literature since the seminal work of Benoit (1973) that suggests investments in military lead to an enhancement of the economy. In the Middle Eastern countries, it has been noted that armed forces play an important socio-economic role beyond maintaining security by absorbing excess labor that might otherwise be unemployed and politically disruptive (Rubin 2001). On the other hand, it could retard economic growth by crowding out investments in health care, education, infrastructure, etc. (Dunne et al. 2002). Thus we believe the direct effect on domestic terrorism could be insignificant due to such opposing effects. Later on, we confirm econometrically that this is a valid instrument.

[5] As per Belasco (2014), the U.S. military expenditure in 2011 was $107 bn. in Afghanistan and $47 bn. in Iraq (see Fig. 3 of the report). This can be compared with the military expenditures of the host government [primary source of data on military expenditures is Stockholm International Peace Research Institute (SIPRI)]. According to them, the military expenditure in current $ in 2011 was approximately only $0.3 bn. in Afghanistan and $6 bn. in Iraq. The upshot is that military expenditure by a country's' government in the MENAP region does not equate to the total amount spent on security in the country because a substantial part of these expenditures are incurred by foreign militaries. Besides, security is not the primary motivation for these expenditures as noted in the following discussion featuring domestic terrrorism.

5.2.3 Lagged under-five mortality rate and civil liberties

In the literature, the child (under five) mortality rate has often been considered as an index of development (Urdal 2006, p. 616). A country will be able to reduce its child mortality rate only by undertaking sustained investments in public health. If the government of a country indeed strives to improve the quality of life of its citizens, then there should be less resentment against the government. Consequently, the government need not resort to human rights violations in order to quell any rebellion. This means that a reduction in child mortality rate should be accompanied by an increase in civil liberties, that is, these two variables should be negatively related. It is reasonable to expect the government to reduce civil liberties with a delay after the reduction in the child mortality rate because the chance of a rebellion will go down only after citizens enjoy a high quality of life for some time. Hence, there should be a negative relationship between the lagged value of the under-five mortality rate and civil liberties. This leads to the following hypothesis:

Hypothesis 4 Lagged under-five mortality rate is negatively related with civil liberties.

Lagged under-five mortality rate is unlikely to have any strong direct effect on terrorism of either variety. Therefore, we use it as an instrument and ourconometric tts below confirm that this is indeed a valid instrument. We also use statistical tests to investigate the validity of these IVs. Finally, we use a Durbin–Wu (Hausman type) test to determine if there is empirical evidence to suggest that Civil Liberties is an endogenous variable. We also test the endogeneity of Civil Liberties in the panel setting in a RE specification as follows:

Stage one:

$$Civil\ Liberties_{it} = \theta_0 + \theta_1 X_{it} + \theta_2 IV_{it} + \phi_i + \vartheta_{it} \tag{5}$$

Stage two:

$$y_{it} = \gamma_0 + \gamma_1\ \widehat{Civil\ Liberties}_{it} + \gamma_2 X_{it} + \omega_i + \mu_i \tag{6}$$

In the RE model where we treat the Civil Liberties as the only endogenous variable, we actually estimate a Generalized 2SLS (G2SLS) model: first, we regress the Civil Liberties on exogenous variables X_{it} and IVs; second, we regress y_{it} on the estimated Civil Liberties from stage1 and X_{it} assuming no relation between all the covariates and the unobserved heterogeneity. We use a Hausman type of test to assess the endogeneity of Civil Liberties in RE (by comparing it to the RE with Civil Liberties as exogenous).

6 Results

6.1 Domestic terrorism

In this subsection, we explore the effects of civil liberties on domestic terrorism. We first discuss our results using the exogenous model given in the second column of Table 7. It follows from our regression that Civil liberties is negatively related with domestic terrorism and the coefficient is statistically significant.

One of the governance indicators that we control for is the rule of law, and this tends to reduce domestic terrorism as well. One of the main reasons of terrorism is grievances against the regime, and such feelings tend to be exacerbated when the regime's actions seem arbitrary

Table 7 Domestic terrorism and country characteristics in MENAP countries (random effect)

Dependent variable → independent variables↓	Domestic terrorism incidents (non-IV regression)	Domestic terrorism incidents (IV regression)
Civil liberties	−0.495***	0.432
	(0.0808)	(0.269)
Political repression	−0.0565	−0.0348
	(0.0844)	(0.116)
Voice and accountability	1.270***	0.320
	(0.231)	(0.240)
Political stability	−0.0842	0.144
	(0.100)	(0.130)
Government effectiveness	0.190	−0.357
	(0.207)	(0.298)
Regulatory quality	0.752***	0.129
	(0.173)	(0.246)
Rule of law	−1.230***	−0.466
	(0.208)	(0.296)
Religious fractionalization	0.519	1.190
	(0.649)	(0.895)
Ethnic fractionalization	0.371	0.313
	(0.737)	(1.040)
Linguistic fractionalization	−0.732	−0.443
	(0.697)	(0.977)
Ln (area km sq.)	0.145	0.224
	(0.0931)	(0.137)
Intercept	−2.350	−0.0756
	(1.350)	(1.830)
Number of observations	209	196

*Significance level at 10%
**Significance level at 5%
***Significance level at 1%

or biased towards a particular group. Any government that upholds the rule of law would be perceived to be impartial and this tends to reduce support for terrorism.

We also find that domestic terrorism is positively related with the following: (i) Voice and Accountability and (ii) Regulatory Quality. It is found that domestic terror increases when the ability of the citizens to participate in selecting their government increases (Voice and Accountability). This is due to the fact that some of these MENAP countries are quite new to a democratic setup. This adds support to hypothesis put forth by Eyerman (1998) that newly formed democracies are more vulnerable to terrorism than other types of states.

We also find a positive relationship between domestic terrorism and regulatory quality. A country is said to improve its regulatory quality if it can promote policies that aid in the development of the private sector. In the MENAP region, these policies have often helped a few oligarchs with ties to the regime. For example, Rijkers et al. (2014) examined the case of Tunisia and found that regulation was used primarily to benefit firms that were owned by

President Ben Ali's family. Indeed, Thomas Mirow, the President of the European Bank for Reconstruction and Development, commented in a speech delivered at the London School of Economics (2012) that "In nations like Tunisia and Egypt, the private sector, at least its upper segment, is questioned not because there is an alternative such as communism, but because it has become tainted by cronyism. When these countries did try to shift more emphasis from the state to the private sector, it was often well connected insiders who benefitted and became wealthy." The taint of cronyism means that policies that promote the private sector can breed resentment and this can result in more support for terrorism.

We ran the Breush-Pagan test to compare Random Effects (RE) and OLS models. This test provides evidence of the existence of unobserved heterogeneity across countries (p value < 0.001). We further ran a Hausman type of test to compare between RE and Fixed Effects (FE) models. This test indicates that RE is consistent and correctly specified (p value $= 0.92$) and hence an RE model is more appropriate.

An additional point we examine is the endogeneity of Civil Liberties. These results are presented in Table 7, column (2).[6] In the endogenous OLS model, the Durbin–Wu test (with a p value of 0.97) shows that we cannot reject the hypothesis that Civil Liberties can be treated as exogenous.[7] Therefore, our preferred results in Table 7 are given in the second column (the exogenous model). Also, the Hausman type of test comparing RE versus FE models indicates that RE is consistent and correctly specified (p value > 0.1) and hence an RE model is more appropriate.

6.2 Transnational terrorism

In this subsection, we explore the effects of civil liberties on transnational terrorism. First consider the exogenous model presented in the second column of Table 8. We find that in the exogenous model, Civil liberties is negatively related with transnational terrorism but the coefficient is statistically insignificant. Hence, there is no perceptible impact of civil liberties on transnational terrorism.

We find that there is a decrease in transnational terrorism when the regime is perceived to be stable. This is consistent with other papers such as Kis-Katos et al. (2011). We also find that transnational terrorism is positively related with the following: (i) Government Effectiveness and (ii) Religious Fractionalization. The positive relationship between Government Effectiveness and Terrorism is because some of these MENAP countries are quite new to a democratic setup and newly formed democracies are more vulnerable to terrorism than other types of states.

We ran the Breusch–Pagan test to compare between RE and OLS models. This test provides evidence of unobserved heterogeneity across countries (p value < 0.001). We also ran a Hausman type of test to compare between RE versus FE models and found that RE is consistent and correctly specified (p value $= 0.83$). Based upon these test results, it appears that the RE model is more appropriate than the other two.

We also evaluate the endogeneity of Civil Liberties. The results of the first stage estimation are reported in Table 10. In the endogenous OLS model, the Durbin–Wu test (with a p value of 0.35) shows that we cannot reject the hypothesis that Civil Liberties could be treated as

[6] The results of the first stage estimation are reported in Table 9.

[7] The first stage F-test yielded a p value < 0.0001. The over-identification test indicated a p value $= 0.3540$. In the Stock–Yogo test, Cragg–Donald Wald F statistic is 9.882. These indicate we have strong and valid IVs.

Table 8 Transnational terrorism and country characteristics in MENAP countries (Random Effect)

Dependent variable → independent variables↓	Transnational terrorism incidents (non-IV regression)	Transnational terrorism incidents (IV regression)
Civil liberties	−0.022	−0.120***
	(0.018)	(0.046)
Political repression	−0.009	−0.034*
	(0.015)	(0.019)
Polity	0.003	0.002
	(0.002)	(0.002)
Voice and accountability	0.025	0.001
	(0.055)	(0.055)
Political stability	−0.048**	−0.032
	(0.020)	(0.025)
Government effectiveness	0.122***	0.167***
	(0.042)	(0.054)
Regulatory quality	−0.042	0.027
	(0.033)	(0.046)
Rule of law	−0.057	−0.143**
	(0.039)	(0.060)
Lack of press freedom	−0.001	−0.005**
	(0.001)	(0.002)
Religious fractionalization	0.103**	0.060
	(0.042)	(0.053)
Ethnic fractionalization	−0.010	−0.088
	(0.060)	(0.075)
Linguistic fractionalization	−0.095*	−0.083
	(0.053)	(0.064)
Ln (area km sq.)	−0.017**	−0.025***
	(0.007)	(0.009)
Ln (elevation)	0.014	0.028
	(0.014)	(0.017)
Tropical area	0.035	−0.005
	(0.034)	(0.041)
Intercept	0.193	0.140
	(0.156)	(0.180)
Number of observations	187	175

*Significance level at 10%
**Significance level at 5%
***Significance level at 1%

exogenous.[8] Therefore, our preferred results in Table 8 are given in the second column (the exogenous model). Also, the Hausman type of test comparing RE versus FE models indicates

[8] The first stage F test yielded a p value < 0.0001. The over-identification test indicated a p value $= 0.647$. In the Stock–Yogo test, Cragg–Donald Wald F statistic is 16.928. These indicate we have strong and valid IVs.

that RE is consistent and correctly specified (p value>0.1) and hence an RE model is more appropriate.

We find that from the first stage of the regression that oil revenue has a positive impact on civil liberties whereas military expenditure and under-five mortality rate have a negative impact on civil liberties (Appendix Table 10). This validates our hypothesis regarding the instruments.

6.3 Robustness check

As noted in Roodman (2009a, b), in our study T (11) is large as compared with N (19) and therefore dynamic panel bias becomes somewhat insignificant, and a more straightforward fixed-effects estimator is deemed more reliable. Further, the number of instruments in difference and system GMM tends to explode with T and if N is small, the cluster–robust standard errors and the Arellano–Bond autocorrelation test may be unreliable.

The above said, we check robustness of our results using Generalized Method of Moments. We adopt the Roodman (2009a, b) extension of Arellano and Bover (1995) for our analysis. Specifically, instead of employing first differences, the estimation approach uses forward orthogonal deviations because the latter limits instrument proliferation and controls for cross-sectional dependence. Noting that all independent indicators could be suspected endogenous or predetermined variables, we adopt the gmmstyle for these variables and only years are treated as exogenous. Further, we treat ivstyle (years) as 'iv(years, eq(diff))' because it is not likely for years to become endogenous in first-difference (Roodman 2009b). In order to address the concern of simultaneity, lagged regressors are employed as instruments for forward-differenced variables.

Our gmm model findings provide additional support to the primary results noted earlier in our exogenous model. Specifically, we find that higher level of civil liberties reduces domestic terrorism whereas they don't influence transnational attacks. Further, we find that current domestic and transnational terrorist attacks tend to depend positively upon the number of past attacks. Hence, the incidence of terrorism is strongly history dependent.[9]

A few other statistics are of note here. These hold for both domestic and transnational terrorism. First, the null hypothesis of the second-order Arellano and Bond autocorrelation test in difference for the absence of autocorrelation in the residuals is rejected. Second, the Sargan and Hansen overidentification restrictions tests are insignificant and supports the null hypotheses that the instruments are valid and not correlated with the error terms. Third, we find that the Difference in Hansen Test statistic is insignificant and therefore bolsters the validity of results from the Hansen overidentification restrictions test. Finally, we find that the Fischer test statistic supports the joint validity of estimated coefficients.

7 Concluding remarks

There is a view that the development of an appropriate legal framework and the preservation of political freedom and social justice are a winning strategy for democratic countries in response to potential terrorist threats (Hinnen 2009). Existing scientific studies, however, present contradictory causal arguments about the effect of democratic governance on reducing terrorism. A majority of studies claim that, because democracies promote high levels of civil liberties such as freedom of association and legal rights for accused criminals (e.g., terror

[9] The results are provided in Appendix Tables 11 and 12 respectively.

suspects), they are more likely to be vulnerable to potential terrorist attacks (e.g., Eubank and Weinberg 1994, 2001). In contrast, a relatively small number of studies maintain that, because democracies encourage political participation and nonviolent resolution of conflicts, their chance of experiencing terrorist incidents is subsequently diminished (e.g., Eyerman 1998). As these unresolved and ongoing debates demonstrate, current scholarship fails to offer a concrete answer to the question of whether democracies attract more terrorist attacks than non-democracies.

We extend the literature to examine if lack of civil liberties is an important reason for the rise of terrorism in the Middle East. This article considers this question using an exogenous as well as an endogenous framework. Our primary findings are that: (i) An increase in civil liberties is associated with a reduction of domestic terrorism but not of transnational terrorism, (ii) We cannot reject the null hypothesis that civil liberties is exogenous. (iii) We also find that domestic terrorism is positively related with voice and accountability and regulatory quality and (iv) we find that transnational terrorism is positively related with government effectiveness and religious fractionalization.

Our findings add support to the studies that have shown that democratic reforms that uplift the civil liberties of the nation's citizens does have a positive impact in curbing domestic terrorism. Further, this adds support for the respect of civil liberties as a key piece of the counterterrorism policy pursued by nations such as United States in their attempt to combat terrorism.

Appendix

See Tables 9, 10, 11 and 12.

Table 9 First stage regression of civil liberties on exogenous variables (domestic terrorism)

Variables	Domestic incidents		
	Coef.	SE	Test stat
Political repression	−0.176**	(0.083)	−2.12
Voice and accountability	0.136	(0.212)	0.64
Political stability	−0.135	(0.099)	−1.36
Government effectiveness	0.482**	(0.212)	2.27
Regulatory quality	0.345**	(0.173)	1.99
Rule of law	−0.659***	(0.219)	−3.01
Religious fractionalization	−0.724	(0.749)	−0.97
Ethnic fractionalization	−0.893	(0.853)	−1.05
Language fractionalization	1.139	(0.829)	1.37
Ln (area km^2)	−0.153	(0.111)	−1.38
Military expenditure	0.00001	(0.00001)	0.85
Under-five mortality rate	−0.016***	(0.004)	−3.93
Intercept	−1.342	(1.520)	−0.88
Number of observations		196	

*Statistical significance at the 10% level
**Statistical significance at the 5% level
***Statistical significance at the 1% level

Table 10 First stage regression of civil liberties on exogenous variables (transnational terrorism)

Variables	Transnational incidents		
	Coef.	SE	Test stat
Political repression	−0.287***	−0.062	−4.63
Polity	−0.009	−0.008	−1.13
Voice and accountability	−0.379*	−0.222	−1.71
Political stability	−0.057	−0.095	−0.61
Government effectiveness	0.353*	−0.192	1.84
Regulatory quality	0.642***	−0.131	4.9
Rule of law	−0.264	−0.199	−1.33
Lack of Press freedom	−0.032***	−0.007	−4.89
Religious fractionalization	−0.477***	−0.179	−2.66
Ethnic fractionalization	−1.016***	−0.264	−3.85
Language fractionalization	0.399	−0.247	1.62
Ln (area km^2)	−0.059*	−0.032	−1.84
Ln (elev)	0.228***	−0.06	3.81
Tropical area	−0.207	−0.144	−1.43
Oil revenue	0.000000000007***	−2E−12	3.25
Military Expenditure	−0.0001***	−1E−05	−5.36
Intercept	−1.565	−0.643	−2.44
Number of observations		175	

*Statistical significance at the 10% level
**Statistical significance at the 5% level
***Statistical significance at the 1% level

Table 11 Domestic terrorism and country characteristics in MENAP countries (system GMM)

Variables	Domestic incidents		
	Coef.	SE	Test stat
Domestic terrorism (1 year lag)	1.078***	0.020	54.64
Civil liberties	−0.122*	0.066	−1.85
Civil liberties (1 year lag)	0.123	0.122	1.01
Political repression	−0.007	0.101	−0.07
Political repression (1 year lag)	0.010	0.087	0.11
Voice and accountability	0.195*	0.111	1.75
Voice and accountability (1 year lag)	−0.347	0.253	−1.37
Political stability	0.029	0.043	0.67
Political stability (1 year lag)	−0.110**	0.053	−2.06
Government effectiveness	−0.036	0.186	−0.20
Government effectiveness (1 year lag)	0.031	0.172	0.18
Regulatory quality	−0.159	0.201	−0.79
Regulatory quality (1 year lag)	0.219	0.192	1.14
Rule of law	0.013	0.138	0.09
Rule of law (1 year lag)	−0.055	0.170	−0.32

Table 11 continued

Variables	Domestic incidents		
	Coef.	SE	Test stat
Religious fractionalization	0.035	0.133	0.27
Ethnic fractionalization	0.019	0.096	0.19
Linguistic fractionalization	−0.003	0.086	−0.04
Ln (area km sq.)	−0.028	0.027	−1.07
Intercept	0.061	0.392	0.16
Number of observations		152	

*Statistical significance at the 10% level
**Statistical significance at the 5% level
***Statistical significance at the 1% level

Table 12 Transnational terrorism and country characteristics in MENAP countries (System GMM)

Variables	Transnational incidents		
	Coef.	SE	Test stat
Transnational terrorism (1 year lag)	0.314**	0.128	2.45
Civil liberties	−0.025	0.020	−1.25
Civil liberties (1 year lag)	0.012	0.019	0.62
Polity	0.001	0.028	0.03
Polity (1 year lag)	−0.030	0.029	−1.06
Political repression	0.002	0.003	0.64
Political repression (1 year lag)	−0.002	0.003	−0.73
Voice and accountability	0.092	0.088	1.04
Voice and accountability (1 year lag)	−0.102	0.079	−1.29
Political stability	−0.016	0.042	−0.37
Political stability (1 year lag)	−0.006	0.059	−0.10
Government effectiveness	0.105	0.082	1.28
Government effectiveness (1 year lag)	−0.010	0.075	−0.13
Regulatory quality	−0.009	0.096	−0.09
Regulatory quality (1 year lag)	−0.002	0.086	−0.02
Rule of law	−0.033	0.099	−0.34
Rule of law (1 year lag)	−0.042	0.086	−0.48
Lack of Press freedom	−0.010***	0.003	−3.03
Lack of Press freedom (1 year lag)	0.010***	0.003	3.02
Religious fractionalization	0.026	0.038	0.69
Ethnic fractionalization	0.002	0.073	0.03
Linguistic fractionalization	−0.062	0.067	−0.92
Ln (area km sq.)	−0.005	0.009	−0.62
Ln (elev)	−0.006	0.015	−0.41

Table 12 continued

Variables	Transnational incidents		
	Coef.	SE	Test stat
Tropical area	0.018	0.048	0.37
Intercept	0.223	0.139	1.60
Number of observations		135	

*Statistical significance at the 10% level
**Statistical significance at the 5% level
***Statistical significance at the 1% level

References

Abadie, A. (2006). Poverty, political freedom, and the roots of terrorism. *American Economic Review Papers and Proceedings, 96,* 50–56.

Abrahms, M. (2007). Why democracies make superior counterterrorists. *Security Studies, 16*(2), 223–253.

Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth, 8,* 155–194.

Arellano, M., & Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. *Journal of Econometrics, 68*(1), 29–52.

Bandyopadhyay, S., & Younas, J. (2011). Poverty, political freedom, and the roots of terrorism in developing countries: An empirical assessment. *Economics Letters, 112,* 171–175.

Basuchoudhary, A., & Shughart, W. (2010). On ethnic conflict and the origins of transnational terrorism. *Defence and Peace Economics, 21*(1), 65–87.

Belasco, A. (2014). The cost of Iraq, Afghanistan, and other global war on terror operations since 9/11. Retrieved August 21, 2015, from https://www.fas.org/sgp/crs/natsec/RL33110.pdf.

Benoit, É. (1973). *Defence and economic growth in developing countries*. Lexington: Lexington Books.

Bozorgmehr, N. (2013). Wealth gap rises under Ahmadi-Nejad. Financial Times. January 23.

Chenoweth, E. (2010). Democratic pieces: Democratization and the origins of terrorism. In W. R. Thompson & Reuveny (Eds.), *Coping with contemporary terrorism: Origins, escalation, counter-strategies, and responses* (pp. 97–123). Albany, NY: SUNY Press.

Choi, S.-W. (2010). Fighting terrorism through the rule of law? *Journal of Conflict Resolution, 54,* 940–966.

Crenshaw, M. (1981). The causes of terrorism. *Comparative Politics, 13*(4), 379–399.

de la Calle, L., & Sánchez-Cuenca, I. (2012). Rebels without a territoriy: an analysis of nonterritorial conflicts in the world, 1970–1997. *Journal of Conflict Resolution, 56*(4), 580–603.

Dunne, P., Nikolaidou, E., & Smith, R. (2002). Military spending, investment and economic growth in small industrialising economies. *The South African Journal of Economics, 70*(5), 1–27.

Enders, W., & Sandler, T. (2002). Patterns of transnational terrorism 1970–1999: Alternative time series estimates. *International Studies Quarterly, 46*(2), 145–165.

Enders, W., & Sandler, T. (2006). Distribution of transnational terrorism among countries by income class and geography after 9/11. *International Studies Quarterly, 50,* 367–393.

Engene, J. O. (2004). *Terrorism in Western Europe: Explaining the trends since 1950*. Northampton, MA: Edward Elgar.

Eubank, W., & Weinberg, L. (1994). Does democracy encourage terrorism? *Terrorism and Political Violence, 6*(4), 417–433.

Eubank, W., & Weinberg, L. (2001). Terrorism and democracy: Perpetrators and victims. *Terrorism and Political Violence, 13*(1), 155–164.

Eyerman, J. (1998). Terrorism and democratic states: Soft targets or accessible systems. *International Interactions, 24*(2), 151–170.

Gaibulloev, K., & Sandler, T. (2013). Determinants of the demise of terrorist organizations. *Southern Economic Journal, 79*(4), 774–792.

Gassebner, M., & Luechinger, S. (2011). Lock, stock, and barrel: A comprehensive assessment of the determinants of terror. *Public Choice, 149*(3–4), 235–261.

Global Terrorism Database. (2013). National consortium for the study of terrorism and responses to terrorism. http://www.start.umd.edu/gtd/. Accessed January 2, 2014.

Hamilton, L. C., & Hamilton, J. D. (1983). Dynamics of terrorism. *International Studies Quarterly, 27*(1), 39–54.
Hinnen, T. (2009). Prepared remarks to the Washington institute for near east policy. http://www.washingtoninstitute.org/html/pdf/hinnen.pdf. Accessed May 23, 2013.
International Monetary Fund. (2013). Changes to the database: World Economic Outlook database. http://www.imf.org/external/pubs/ft/weo/data/changes.htm. Accessed January 20, 2014.
Jetter, M, & Stadelmann, D. (2017). Looking at terror attacks 'per capita' should make us rethink our beliefs about levels of risk. Business Insider. http://www.businessinsider.com/terror-attacks-per-capita-is-a-more-accurate-way-to-perceive-risk-2017-6. Accessed October 11, 2017.
Karl, T. L. (1997). *The paradox of plenty: oil booms and petro-States*. Berkeley: University of California Press.
Kis-Katos, K., Liebert, H., & Schulze, G. G. (2011). On the origin of domestic and international terrorism. *European Journal of Political Economy, 27*(Supplement 1), S17–S36.
Krieger, T., & Meierrieks, D. (2011). What Causes Terrorism? *Public Choice, 147*(1–2), 3–27.
Krueger, A., & Laitin, D. (2008). Kto kogo? A cross-country study of the origins and targets of terrorism. In P. Keefer & N. Loayza (Eds.), *Terrorism, economic development, and political openness* (pp. 148–173). New York: Cambridge University Press.
Krueger, A., & Maleckova, J. (2003). Education, poverty and terrorism: Is there a causal connection? *Journal of Economic Perspectives, 17*(4), 119–144.
Kurrild-Klitgaard, P., Justensen, M., & Klemmensen, R. (2006). The political economy of freedom, democracy and transnational terrorism. *Public Choice, 128,* 289–315.
Li, Q. (2005). Does democracy promote or reduce transnational terrorist incidents? *Journal of Conflict Resolution, 49*(2), 278–297.
Lutz, J. M., & Lutz, B. J. (2010). Democracy and Terrorism. *Perspectives on Terrorism, 4*(1), 63–74.
Mirow, T (2012). Where next for the Arab spring? Learning from EBRD engagement in Eastern Europe: Speech by the EBRD president Thomas Mirow to the London School of Economics, London, 15 March 2012. http://www.ebrd.com/pages/news/speeches/mirow_120315.shtml. Accessed September 2, 2014.
Monshipouri, M. (2002). The paradoxes of U.S. policy in the Middle East. *Middle East Policy, 9*(3), 65–84.
Nacos, B. (1994). *Terrorism and the media*. Columbia, NY: Columbia University Press.
OECD. (2000). Foreign direct investment for development: Maximising benefits, minimizing costs. http://www.oecd.org/investment/investmentfordevelopment/1959815.pdf. Accessed July 20, 2013.
Pape, R. A. (2003). The strategic logic of suicide terrorism. *American Political Science Review, 97*(3), 343–361.
Pew Attitudes Global Research Project. (2013). http://www.pewglobal.org/. Accessed July 26, 2013.
Piazza, J. A. (2008). Do democracy and free markets protect us from terrorism? *International Politics, 45*(1), 72–91.
Piazza, J. A. (2013). Regime age and terrorism: Are new democracies prone to terrorism?". *International Interactions, 39*(2), 246–263.
RAND. (2013). Domestic terrorism. http://www.rand.org/topics/domestic-terrorism.html. Accessed September 9, 2013.
Rijkers, B., Freund, C., & Nucifora, A. (2014). All in the family: State capture in Tunisia. Policy Research working paper Washington DC, World Bank Group. WPS 6810.
Roodman, D. (2009a). A note on the theme of too many instruments. *Oxford Bulletin of Economics and Statistics, 71*(1), 135–158.
Roodman, D. (2009b). How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata Journal, 9*(1), 86–136.
Ross, J. I. (1993). Structural causes of oppositional political terrorism: Towards a causal model. *Journal of Peace Research, 30*(3), 317–329.
Ross, M. (2009). Oil and democracy revisited. Preliminary draft paper, (March 2, 2009). http://www.sscnet.ucla.edu/polisci/faculty/ross/Oil%20and%20Democracy%20Revisited.pdf. Accessed July 17, 2013.
Rubin, B. (2001). The military in contemporary Middle East politics. *Middle East Review of International Affairs Journal, 5*(1), 47–63.
Savun, B., & Phillips, B. J. (2009). Democracy, foreign policy, and terrorism. *Journal of Conflict Resolution, 53,* 878–904.
Schmid, A. P. (1992). Terrorism and democracy. *Terrorism and Political Violence, 4*(4), 14–25.
Tavares, J. (2004). The open society assesses its enemies: Shocks, disasters and terrorist attacks. *Journal of Monetary Economics, 51*(5), 1039–1070.
Testas, A. (2004). Determinants of terrorism in the Muslim world: An empirical cross-sectional analysis. *Terrorism and Political Violence, 16*(2), 253–273.
Tullock, G. (1987). *Autocracy*. Heidelberg: Springer.
United States Department of State. (2014). Country reports on terrorism. http://www.state.gov/j/ct/rls/crt/index.htm. Accessed November 15 2014.

Urdal, H. (2006). A clash of generations? Youth bulges and political violence. *International Studies Quarterly*, *50*(3), 607–629.
US Energy Information Administration. (2013). http://www.eia.gov/. Accessed July 17, 2013.
Wilson, M. C., & Piazza, J. A. (2013). Autocracies and terrorism: Conditioning effects of authoritarian regime type on terrorist attacks. *American Journal of Political Science, 57*(4), 941–955.
Wintrobe, R. (1998). *The Political Economy of Dictatorship*. Cambridge: Cambridge University Press.