European Journal of Political Economy 27 (2011) S37–S49

Contents lists available at ScienceDirect

European Journal of Political Economy

journal homepage: www.elsevier.com/locate/ejpe

The socio-economic determinants of terrorism and political violence in Western Europe (1994–2007)

Raul Caruso [a,*], Friedrich Schneider [b]

[a] Institute of Economic Policy, Catholic University of the Sacred Heart, Via Necchi 5, 20123, Milan, Italy
[b] Department of Economics, Johannes Kepler University of Linz, Altenbergerstrasse 69, A-4040 Linz-Auhof, Austria

ARTICLE INFO

Article history:
Received 20 December 2010
Received in revised form 23 February 2011
Accepted 24 February 2011
Available online 5 March 2011

JEL classification:
D72
D74
J49

Keywords:
Economic determinants of terrorism
Political violence
Economic deprivation
Immiserizing modernization
Brutality of violence

ABSTRACT

The main objective of this paper is to empirically investigate the socio-economic causes of terrorism and political violence in a sample of 12 countries in Western Europe. First, we show that in western European countries the classical economic argument of opportunity cost is confirmed. That is, the larger is the set of current economic opportunities for individuals the lower is the likelihood or the willingness for them to be involved in a terrorist activity. Second, expected future economic growth seems to be associated with an increase in current terrorist activities. Eventually, our results also show that terrorist brutality (measured in people killed) is positively associated with real GDP per capita.

1. Introduction

The main objective of this paper is to empirically investigate the socio-economic causes of terrorism and political violence in a sample of countries in Western Europe. Put differently, the main purpose of this work is to discover the socio-economic *preconditions* for terrorism, namely "*factors that set the stage for terrorism over the long run*[1]", as defined by Crenshaw (1981). A collateral objective is providing an explanation of the brutality of terrorist activity, which depends on the number of casualties of terrorist events. First, drawing from Sandler et al. (1983) it is possible to define terrorism as the "*premeditated, threatened or actual use of force or violence to attain a political goal through fear, coercion, or intimidation*[2]". Such a definition encompasses the four characteristics of terrorist activity as presented by Shugart (2006), namely (i) the use of violence (or its threat) for political effect; (ii) a planned course of action; (iii) a boundless behavior outside the context of legitimate conduct of warfare; and (iv) the effort to induce a disproportionate fear and feeling of insecurity among people, especially civilians.[3]

* Corresponding author. Tel.: +39 027234 2921; fax: +39 027234 3739.
E-mail address: raul.caruso@unicatt.it (R. Caruso).

[1] See Crenshaw (1981 p. 381).
[2] Sandler et al. (1983, p.37).
[3] The four characteristics have been recognized by scholars as the fundamental components of terrorism. On the debate to define and conceptualize terrorism see Weinberg et al. (2004) and Schmid (2004).

0176-2680/$ – see front matter © 2011 Elsevier B.V. All rights reserved.
doi:10.1016/j.ejpoleco.2011.02.003

The most important economic explanations of roots of terrorism generally focus on two main aspects.[4] On one hand, poor economic conditions and lack of economic opportunities are supposed to favor the emergence of terrorism and political violence. In fact, poverty and income inequality would feed frustration, hatred and grievance which make political violence more likely. In fact, in the presence of widespread poverty, the opportunity cost for individuals is very low. This is supposed to favor the recruitment process undertaken by terrorist organizations. This point (which is based on the classical opportunity-cost argument) is commonly known as *economic deprivation* argument. The recent most cited source of the *economic deprivation* argument is Gurr (1968) who studied the root causes of political violence in western societies.

A second interpretation of the causes of terrorism can be defined as *immiserizing modernization theory*. Thus, according to this theoretical argument developed by Olson (1963), economic growth is expected to produce a shift in the distribution of interest so as fuelling the grievances of some groups of the society. Namely, the basic intuition of this argument is that socio-economic changes over long-run affect socio-economic conditions. In this view, terrorist organizations would flourish if they are able to collect and capitalize on the grievances of losers. Therefore, terrorism and political violence would emerge in the presence of economic growth and development.

With regard to the collateral objective mentioned above, namely explaining the brutality of terrorist events, in the latest years some scholars also expounded and tested the hypothesis that terrorist activity is positively related to the education and standard of living. That is, better educated individuals would become bloodier terrorists. Put differently, this idea predicts a positive relationship between education and terrorist activity.

The main novelty we claim for this paper is the focus on western European countries. In fact, the analysis of terrorism in western European countries may be peculiar in this respect. Western European countries are high-income countries where schooling and education are spread across society. Moreover, a complex architecture of welfare state reduces inequality within countries. In addition political and civil rights of citizens are guaranteed to a large extent. In spite of these favorable conditions, political violence and terrorism occur in western European countries. Then, it is interesting to investigate how political violence and terrorism take shape in this context.

The paper is structured as follows: In chapter 2 some theoretical interpretations are presented and discussed. In chapter 3, the sample of countries and some stylized facts about political violence are presented. In chapter 4, both dependent and explanatory variables are presented and discussed. Chapter 5 presents the econometric results and aims to explain the emergence of terrorist events, and chapter 6 shows the econometric results trying to explain the brutality (measured in number of people killed) of terrorist events. Chapter 7 then summarizes and concludes.

2. The emergence of political violence and terrorism

There are several studies analyzing economic conditions and emergence of political violence and terrorism. In particular, economic discontent is commonly associated with the emergence of political violence. Two main theories can be proposed to explain this phenomenon.

A first argument based on economic discontent is popularized as economic deprivation. It is a component of the broader *relative deprivation theory* as expounded by Ted Robert Gurr (see Gurr, 1968, Gurr, 1970a,b). The backbone of the theory is the perceived discrepancy between expected payoffs and actual payoffs of individuals. Whenever such discrepancy becomes collective it feeds anger and frustration which easily translate into collective violence. Echoing Gurr (1968), "[…] *my basic premise is that the necessary precondition for violent civil conflict is relative deprivation, defined as actors' perception of discrepancy between their* ***value expectations*** *and their environment's apparent* ***value capabilities****. Value expectations are the goods and conditions of life to which people believe they are justifiably entitled. The referents of value capabilities are to be found largely in the social and physical environment* […] *For purposes of general theoretical specification I assume that perceived discrepancies between expectations and capabilities with respect to any collectively sought value – economic, psychosocial, political – constitute relative deprivation* […]".[5] According to the theory, whenever the discontent turns to be widespread within societies, individuals and groups are more likely to turn to political violence and civil strife. In the latest decades, Gurr's theory had become the major reference for a copious literature which analyzes the implications of socio economic conditions on emergence of political violence, even if empirical results in some cases provided mixed results. (see among others Bohlken and Sergenti, 2010; Brush, 1996; Muller and Weede, 1990).

A second argument can be defined as *immiserizing modernization*. Firstly, Olson (1963) suggested that economic growth could fuel social and political unrest. This is somehow a counterargument to the modernization theory as expounded by Lipset (1959) and recently confirmed by Gundlach and Paldam (2009). Thus, in his argument, Olson argued that in the presence of a rapid economic growth several imbalances are likely to occur so determining a higher degree of unevenness which turns to be closely related to the emergence of social disorders and political violence. Echoing Olson "[…] *Economic growth – especially rapid economic growth – therefore involves vast changes in the methods of production. It involves vast changes in the importance of different industries, in the types of labor demanded, in the geographical configuration of production. It means vast changes in the ways and places in which people live and work. Above all, economic growth means vast changes in the distribution of income* […]".[6] In particular, Olson identified two forces at work in the short run: (1) first, prices rise faster than wages. That is, as the demand increases prices are likely to

[4] For a comprehensive discussion please refer to the survey by Schneider et al. (2010), Krieger and Meierrieks (2010) and Enders and Sandler (2006).
[5] Gurr (1968, p. 252–253), emphasis in the original, italics turned to bold.
[6] Olson (1963, p. 532).

increase accordingly in the short run. Contrariwise, wages are sticky and do not adjust at the same speed. This can lead to a widespread collapse of a purchasing power of individuals; (2) secondly, technological improvement in some specific sectors can lead to a shift of labor demand towards more skilled workers. Therefore, the unskilled laborers can become a destabilizing force. Therefore, the process of economic growth would be intrinsically uneven at least in the short run. Olson somehow recalled also the famous theory of Kuznets (1955) that predicted an increasing inequality in the short run. Olson's theory has been tested with mixed results (see among others White, 1989; Venieris and Gupta, 1983; Sofranko and Bealer, 1973). What is missing in Olson's original formulation is any role for government. Following Ray (2010), it is possible to add a third channel of grievance, namely the political economy of uneven growth. That is, since policymakers can create advantages for certain sectors through several means, social grievance can be either exacerbated or mitigated by some economic policy. In other words, in the presence of a rapid economic growth, economic policies undertaken by governments can mitigate or magnify the predictable effect of economic growth.

The two theories are not necessarily inconsistent with each other. They can be interpreted as complementary. They point out different aspects which generate political violence. A first fundamental difference is that Olson's argument is dynamic whereas Gurr's relative deprivation theory in its original formulation can be considered as a static theory. In fact, in Olson (1963) the focus is on the transition from a social equilibrium to another. In the presence of a very rapid growth, the path between the two equilibria can be highly unstable. That is, the theoretical argument is dynamic in itself and it deals with the very short run effects of economic growth. In fact, Olson also provides an analytical explanation which is based on Domar's dynamic model of growth. Instead, the theoretical argument proposed by Gurr is static. That is, it is intended to capture at a certain point in time the characteristics of a social state which may affect the likelihood of civil violence. In fact, the main focus is on the components of such social state. Thus, it does not account explicitly for the possibility and the conditions of a social change.

A second difference between the two theories is that in Gurr's argument grievance takes shape in the presence of a positive distance between the expected payoffs and actual payoffs of individuals or groups. That is, the distance is computed between an existing economic outcome and a reference point which has not actually taken shape. By contrast, in Olson's argument, when considering the losers of economic growth, losers take into consideration the distance between past economic rewards and current economic opportunities. Put differently, agents take into account the losses emerging from the shift in economic scenario.

A third difference that could be highlighted is the approach towards economic decline and recession. Interestingly, in Olson's reasoning there are only few lines devoted to economic decline. Olson simply states that a sudden decrease in the level of income, like a rapid economic growth, can fuel political instability. In fact, it would determine a rapid shift in economic relative positions. Put differently, it seems that there are no systematic differences between a rapid economic growth and a sudden economic crisis. They both determine gainers and losers. Finally, it is not the economic growth, but rather the sudden shift in economic scenario in itself which raises the likelihood of political instability. By contrast, at a deeper reading, Gurr's theory can provide even insights for interpreting periods of economic decline. This is mainly related to the psychological roots of Gurr's theory. Individuals are not likely to update easily their beliefs. In fact, if agents do not easily update their beliefs, they are likely to perceive even a higher discrepancy between expected rewards and actual payoffs. The value attached to the expected rewards would not change whereas the realized payoffs may decrease very easily. Consequently, perception of relative deprivation is likely to increase. Consequently, anger and frustration rise. That is, in spite of new information available agents are not likely to update their beliefs accordingly in the very short run.

However, there are some aspects which make the two theories complementary. Both theories provide a systematic insight into the relationship between economic inequality and political violence. That is, from both theories it is possible to infer that income inequality within societies can easily translate into political instability (see among others Dutt and Mitra, 2008; Murshed and Gates, 2005; Alesina and Perotti, 1996).

A second insight is related to the concept of opportunity cost. Put differently, both theories can be explained in terms of opportunity cost. In both cases, opportunity cost of individuals is re-shaped so affecting the likelihood of joining terrorist groups. The point is quite straightforward for Olson's theory. Given a rapid shift in economic environment, the losers either experience or perceive a clear-cut loss in economic opportunities. Their opportunity cost decreases. However, in the case of Gurr's theory an additional conjecture is necessary. Reasoning about opportunity cost is commonly based on actual values. But it can be applied to anything which is worth for individuals. Consequently, the larger is the discrepancy between expected and actual reward, the lower is the opportunity cost of individuals. Put differently, the deeper is the feeling of frustration because of *relative deprivation*, the lower must be the opportunity cost of the individuals. However, needless to say, it is clear that the opportunity cost argument take different shapes while considering the two theories. In particular, it can be argued that the *immiserizing modernization* theory is intended to capture a perception of opportunity cost which takes shape while considering future economic (and non-economic) rewards and their expected difference with desired payoffs. Briefly, the *immiserizing modernization* argument is backboned by future opportunity cost. Eventually, the *economic deprivation* argument is based upon an opportunity cost which takes into account, *primo loco*, past economic opportunities and rewards. That is, at a certain point in time, individuals evaluate the current set of actual economic payoffs so evaluating whether or not they increased their own utility. Briefly, the *economic deprivation* argument is backboned by current opportunity cost.

With particular regard to emergence of terrorism, in the latest years, several studies confirm the opportunity cost argument but with no clear-cut distinction between future and current opportunity costs. Blomberg et al. (2004) using the ITERATE database, analyze a panel of 127 countries over the period 1968–1991. By means of a bivariate Markov process, the authors investigate whether or not there is a relationship between emergence of terrorism and the state of a country's economy. Results show that periods of economic contractions increase the likelihood of terrorist activities. This result appears to be more robust for high-

income and democratic countries. Piazza (2006) also does not find any significant relationship between economic development and terrorism. In particular, this study employs alternatively as dependent variables the incidence of terrorist attacks and casualty rates. The data spans from 1986 to 2002. The independent variables used in the analysis include a set of economic variables (HDI, GINI coefficient, GDP growth, inflation, and unemployment), demographic variables (population and population growth and ethnic diversity), and political variables (number of parties and index of political repression). The results show that none of economic variables exhibits a significant association with both the incidence and the casualty rate of terrorist activity. Abadie (2006) uses country level data for 2003–2004 and shows that an increase in per capita GDP is associated with a reduction of terrorism, even if after controlling for other country characteristic national income is no longer associated with terrorism. Burgoon (2006), analyzes the relationship between welfare policies and the emergence of terrorism. The author uses three different sources: the ITERATE database (for the period 1991–1998), the MIPT–RAND database (1998–2003) and the US State Department data (1996–2001). Thus, in negative binomial regressions this study employs alternatively as dependent variables: (i) the total number of transnational terrorist incidents in a country; (ii) the total number of terrorist incidents in a country; (iii) the number of significant transnational terrorist incidents by country of perpetrator(s). The independent variables used in the analysis include first the total welfare spending on health, security and education and eventually a set of variables as: GDP per capita, trade openness, population, government capacity, left-wing government and index of democracy).

Freytag et al. (2008), present mixed results either confirming or contrasting the idea that terrorism is negatively associated with better socio-economic conditions. The analysis covers the period 1971–2005. The dependent variable is constructed as the number of terror incidents originating from a country during a five year span (ex. 1971–1975). The explanatory variables are clustered into three groups. (i) economic variables as – among others – GDP per capita, investment and trade openness; (ii) population characteristics as size and level of education; and (iii) country specific effects related to institutional quality. The empirical findings show interesting evidence. Surprisingly, the impact of GDP per capita on terror is significantly positive (except for European countries) in simple form whereas the association turns to be significantly negative when GDP per capita is in quadratic form. The association between investment and terrorism is significantly negative with the exception of Islamic countries which show a positive association. Yet, human capital seems to be negatively associated terrorism with the exception of Islamic countries. The authors interpret such evidence as there is a significant threshold of development. As long as this threshold is not surpassed, better economic performance encourages terror. Instead, as the threshold is surpassed the usual interpretation of opportunity costs holds. The latest result in particular, suggests that perhaps other factors may be significant while explaining these phenomena. Put differently, the classical argument of opportunity cost perhaps does not exhaust the explanation of emergence of political violence.

Recently, an alternative explanation has been proposed by Bernholz (2004). The author claims that in the presence of 'supreme values' as in totalitarian or religious cultures, societies can experience the emergence of ideologically based terrorism. In particular, this kind of behavior may take place irrespective of any reasoning about opportunity cost. Whenever, individuals exhibit a utility function which is increasing in both an ideological good and a consumption good, the demand of the first good increases in the level of disposable income thereby increasing the demand for terrorist actions. Such a behavior is magnified in the presence of widespread 'supreme values' within a society. The supreme value argument is in line with the 'sacrifice trap' argument as expounded in Boulding (1973, 1989). Hillman (2007) discusses and enriches the argument of supreme values in rent-seeking economies, as in the Radical Muslim Gaza Strip or in Arab oil-exporting countries. According to the author, in spite of potential prosperity, self-deprivation and economic stagnation are determined exactly by dominance of supreme values. In fact, in this context, there is no clear evaluation of opportunity cost among individuals. That is, consequently, even a predictable economic growth has no detrimental impact on emergence of terrorism and political violence.[7] In this vein, Borooah and Paldam (2007) also highlight that communism and Muslim culture both as barriers to democracy. Hence, the supreme value argument is in line with the analysis proposed by Kirchgässner (2010) about minimal morals and the proper functioning of democratic and market-oriented societies. Following the argument, moral requirements for citizens need not be too high.

Eventually, this may be linked to another channel of research, namely the relationship between terrorism, political violence and education levels. Recently, some scholars also expounded and tested the hypothesis that terrorist activity is positively related to the education and standard of living. That is, better educated individuals would become bloodier terrorists. This argument has been introduced first by Lenin (1901) while theorizing about political agitation and it had been recently rediscovered by Krueger and Maleckova (2003) for political violence in Israel and Bueno de Mesquita (2005). Berrebi (2007) and Benmelech and Berrebi (2007) with a specific focus on suicide attacks in Israel show that that both higher education and standard of living are positively associated with the incidence of suicide attacks. In the first paper, both higher education and standard of living appear to be positively associated with membership in terror organizations such as Hamas or PIJ and with becoming a suicide bomber. The empirical analysis is run by mean of a logistic regression where the dependent variable equals 1 if the individual is a member of Hamas or Palestinian Islamic Jihad (PIJ) and 0 otherwise. In the latter paper, the authors use a sample of 148 suicide attacks which represents 89% of the total number of suicide attacks between September 2000 and August 2005. The dependent variable is the number of people killed or injured in suicide attacks whereas the explanatory variables are given by age and education of suicide bombers and importance of target. In their interpretation, older and better educated suicide bombers, when assigned to more important targets, are more effective killers. Krueger (2008) studies 68 home-grown Islamic terrorists in U.S.A. The author shows

[7] A negative association between oil dependence and democracy is also in Potrafke (2010).

that alleged terrorists are better educated than average population of Muslim Americans so concluding that there is a greater supply of potential terrorists among more highly educated individuals.

3. Terrorism and political violence in western European countries: Facts and figures

The present study is based on a sample of 12 countries: Italy; France; Germany; Spain, Switzerland, Sweden, UK, Netherlands, Belgium, Austria, Greece, and Ireland. As noted above the study is peculiar because in the countries of the sample, apparently there are no specific reasons which would fit with the argument proposed. All the countries are high-income countries characterized by high level of human development in line with UNDP definition and measurement.

Moreover, they also did not experience a rapid economic growth in the years of the study. Contrariwise, they experienced a balanced growth path over the years 1994–2007. The only exception had been Ireland where average GDP per capita growth rate had been higher than six percent. However, to capture the impact of a changing economic environment it is possible to have a look at the degree of openness. It is clear that the growth rate of openness widely differs among the sampled countries. That is, the sampled countries opened their economies at a different pace. In particular, Germany shows the highest growth rate for openness in the period 1994–2007 (+100.3%), whereas Italy shows the lowest rate (+17.7%).

Finally, education is widespread across society. In fact, the education indices computed by UNDP approach the maximum level possible. The education index measured by UNDP is intended to capture a country's relative achievement in adult literacy and school enrolment.

The data of terrorist incident are drawn from Global Terrorism Database (GTD).[8] Differently from the original GTD dataset, we aggregated England and Northern Ireland as well as France and Corse. Table 3.2 reports the figures for terrorist incidents for the period 1994–2007. France is the country where the highest number of incidents has been reported (29%) followed by UK (23%) and Spain (18%). As it is clear from Table 3.2, most incidents do not span victims. More precisely, for the 97% of incidents a non-negative number of victims less than five is reported.

Yet, a clear peculiarity of European political violence is that it spans different types. Table 3.3 reports the number of active groups which perpetrated some terrorist actions in the period considered (1994–2007). Coding and definitions of terrorist groups are those applied in GTD dataset. Then, we divided the total numbers into main five categories: (i) right-wing and neo-nazi extremists; (ii) left-wing; (iii) anarchist; (iv) separatist and independentist; and (v) international. In particular, by 'international' we meant either the groups which have either an international vocation or those with specific national targets but which are operating abroad. The Al-Qaeda-style jihadist is an example of the first category. The Kurdistan Workers' Party (PKK) is an example of the second category. In fact, it seems that the PKK has operated continuously in Germany in the early 90s.

Such diversity in terrorist scenario is certainly a peculiar trait of western European countries. To summarize, Table 3.3 presents quite nicely the diversity of terrorist activities in our sample of European countries. To give a more accurate measure of such diversity it is also possible to compute the Shannon index of entropy, (Shannon and Weaver, 1949, Patil and Taillie, 1982). The diversity can be defined as the average property of a 'community' which consists of a discrete quantity of types (s). In our context the types are the five categories of terrorist groups mentioned above. Let N denote the number of active groups in each country, n_i the number of groups of type i and eventually $p_i = n_i/N$ the relative abundance of type i. In our context, for example, the relative abundance of type 'anarchist' in Greece is given by the ratio *number of anarchist groups/total number of active groups*. Then, a community is the pair $C = (s, \mathbf{p})$ where $\mathbf{p} = (p_1, p_2, p_3 \ldots)$ is the species abundance vector. In our context the set of active groups in each country does constitute a 'community'. The Shannon index for each country is given by $E = -\sum_i^n p_i \ln p_i$. We can normalize the index to range from zero to unity by $\overline{E} = E / ln(N)$. Table 3.4 reports the Shannon index for the sampled countries. If $\overline{E} \to 0$, namely if the diversity approaches zero, there is only one active terrorist group perpetrating all terrorist attacks. If $\overline{E} \to 1$ the degree of diversity approaches its maximum. Among the biggest countries in Europe it appears clear that Spain shows a higher degree of diversity. Interestingly, in spite of the largest number of active groups in Europe, Greece shows a relatively low degree of diversity. This depends on the relative abundance of two types ('left-wing' and 'anarchist') which dominate the other types. Similarly, France and UK show also a low degree of diversity. In both cases, the independentist type dominates the other terrorist groups.

4. Main explanatory variables, source and expected meaning

In order to study deeply the peculiar traits of European terrorism and political violence, two dependent variables have been used: 1) the number of terrorist incidents per year; and 2) the number of victims per incident. The chosen dependent variables are assumed to capture two different aspects of incidence of terrorism and political violence.

The first dependent variable, namely the number of terrorist incidents per year, is expected to capture the emergence of terrorist attacks. That is, the first empirical model is expected to infer the political and economic determinants of terrorist activity. To sum up, as noted above, when using the number of incidents per year in a given country, we are studying the pre-conditions for terrorism in that country.

The second dependent variable is the number of victims per incident, which is intended to capture the brutality of terrorism. In particular, brutality of terrorism is somehow a measure of terrorist output.

[8] http://www.start.umd.edu/gtd/ (accessed August 2010).

Table 3.1
Some descriptive figures.
Source: *Penn World Tables; **Elaborations on Penn World Tables data; ***UNDP, HDR2004; § UNDP, HDR2008, Survey year 2000.

	% GDP growth rate (av. 1994–2007)	% Growth rate of openness (1994–2007)**	Education index***	Gini§	HDI (2002)***
France (incl. Corse)	1.77	50.78	0.96	32.7	0.932
UK (incl. Northern Ireland)	2.84	37.98	0.99	36	0.936
Spain	3.63	64.05	0.97	34.7	0.922
Germany	1.47	100.31	0.95	28.3	0.925
Greece	3.60	42.43	0.95	34.3	0.902
Italy	1.53	17.70	0.93	36	0.92
Netherlands	2.26	59.21	0.95	30.9	0.942
Austria	2.19	63.53	0.96	29.1	0.934
Belgium	2.27	25.81	0.99	33	0.942
Ireland	6.41	48.83	0.96	34.3	0.936
Switzerland	1.26	57.63	0.95	33.7	0.936
Sweden	3.02	55.87	0.99	25	0.946

Table 3.2
Terrorist incidents in Western Europe (1994–2007).
Source: GTD.

Country	Number of incidents	Classified by number of victims			
		≤ 5	$<5 \leq 25$	$<25 \leq 50$	>50
France (incl. Corse)	781	767	12	1	1
UK (incl. Northern Ireland)	608	579	16	7	6
Spain	493	475	11	3	4
Germany	329	319	9	1	0
Greece	262	260	1	0	1
Italy	93	91	1	1	0
Netherlands	26	26	0	0	0
Austria	25	25	0	0	0
Belgium	22	20	2	0	0
Ireland	22	22	0	0	0
Switzerland	21	20	0	1	0
Sweden	13	13	0	0	0
Total	2695	2617	52	14	12

Victims are computed as the sum of killed and wounded people.

The main explanatory variables are listed below in Table 4.1. Henceforth, we briefly describe them highlighting the relationships with the competing arguments.[9] First, GDP per capita is commonly assumed to be the proper indicator for the socio-economic conditions. Therefore, a negative association between GDP per capita and emergence of terrorism, *ceteris paribus*, would confirm the *economic deprivation* argument. At the same time, while considering the brutality of terrorist incidents, a positive association between GDP per capita and the number of victims would confirm the idea according to which better educated individuals can become bloodier terrorists. The investment share of real GDP measures the share of investments in relation to total production. In general, the investment share captures the new stimulus for economic development. Therefore, if the association between investment share of GDP and emergence of terrorism turns to be positive, *ceteris paribus*, it would support the *immiserizing modernization* argument. Actual growth rate of real GDP per capita also would capture alternatively either the economic deprivation or the modernization argument; hence the sign is undecided.

Unemployment is also commonly assumed as a proxy for a broader social welfare. The higher is the rate in unemployment the lower is assumed to be social welfare. Moreover, the higher is the number of unemployed individuals, the higher might be the number of potential terrorist because of a lower opportunity cost. Therefore, needless to say, following the economic deprivation argument unemployment can be predicted to be positively associated with eruption of terrorism and political violence. Empirical evidence in this respect has been provided for several scenarios. Sayre (2009) shows a positive relationship between unemployment and Palestinian suicide bombings in West Bank. Honaker (2010) shows that unemployment is a leading factor to explain violence in Northern Ireland. Oyefusi (2010) shows that in Nigeria's Delta, unemployment appears to increase the willingness to participate in civil violence among the group of young schooled individuals. Interestingly, the association between unemployment and civil violence is not statistically significant unless an interaction term between unemployment and education is considered. That is, this seems to confirm punctually the deprivation theory.

[9] With the respect to the interpretation of the following explanatory variables, one referee criticized that we infer improperly microeconomic behavior from macroeconomic data. We have the problem, that we develop hypotheses about microeconomic behavior from macro (and not from micro) data. We are aware that this is only a crude approximation but we see no possibility to do this from micro data which does not exist and where we have no possibility to empirically test it with the necessary micro data set. As a first approximation and in order to provide some results we use macro data.

Table 3.3
Types of terrorist activities/groups.
Source: *GTD.

	Active groups in the period 1994–2007*	Right-wing/neo-nazi	Left-wing	Anarchist	Separatist/independentist	International	Other
France (incl. Corse)	29	1	0	0	16	4	8
UK (incl. Northern Ireland)	24	2	0	0	13	3	6
Spain	10	1	1	1	3	2	2
Germany	26	3	5	1	1	11	5
Greece	50	5	14	16	1	4	10
Italy	23	2	8	2	3	0	8
Netherlands	4	0	0	1	0	2	1
Austria	10	2	1	0	0	5	2
Belgium	5	0	0	0	0	3	2
Ireland	5	0	0	0	2	0	3
Switzerland	4	0	1	0	0	2	1
Sweden	7	4	0	0	0	2	1

Table 3.4
Diversity in terrorism.

	Shannon index
Netherlands	0.75
Switzerland	0.75
Spain	0.74
Austria	0.53
Sweden	0.49
Germany	0.46
Italy	0.45
Belgium	0.42
Ireland	0.42
Greece	0.40
UK (incl. Northern Ireland)	0.36
France (incl. Corse)	0.32

Thus, a collateral argument is related to youth unemployment. In fact, the youth unemployment rates in general are significantly higher than adult rates and they are more cyclically variables. In the presence of increasing youth unemployment rates, the sense of grievance and frustration can be channeled to political violence. In this respect it is also important to consider that youth unemployment rates often reflect discrimination in labor market based upon ethnic origins. In the UK, for example, the Department for Education and Employment estimated the unemployment rates of all ethnic minorities to be 17.6% compared to a rate of 7.7% for "Whites" (O'Higgins, 1997). Moreover, given the structural characteristics of youth labor market, the opportunity costs of would-be young terrorists is lower than adult. Such predicted association falls also within the broader argument of eruption of political violence in the presence of "youth bulge" (Urdal, 2006).

Eventually, labor productivity is a fundamental capacity of economic system to grow in the long-run. It captures the capacity of economic systems to grow continuously and in a sustainable way. Moreover, labor productivity also captures the ability of workers to earn higher salaries so shaping the set of economic opportunities for individuals. The measure of labor productivity adopted here is drawn from ILO-KILM database and it is computed as the GDP per hour worked. To our knowledge there is no previous analysis of the relationship between terrorism and labor productivity. Probably, if current labor productivity is high enough to raise the opportunity cost of would-be terrorist, the association between it and the emergence of terrorist incidents is to be expected negative.

Inflation denotes the average annual change in consumer price index and it is extracted from IMF/WEO. On one hand, it proxies changes in purchasing power of individuals which can affect the standard of living. For instance, Fielding and Shortland (2010) study the consequences of an increase in the price of bread on the number of casualties in Egyptian political violence. As the price of bread increases the number of Egyptian civilians killed and wounded by other civilians also increases as well as the number of security forces casualties. Instead, Caruso and Schneider (2010) found a robust negative association between inflation and the number of victims of jihadist terrorist incidents in a sample of twenty countries. If assuming that a positive inflation rate is associated with an increasing trend of the economy, *ceteris paribus*, a negative association between incidence of terrorist events and inflation would confirm the *economic deprivation* argument. A similar reasoning can be produced for the degree of openness. The current degree of openness has been drawn from Penn World tables and it is commonly assumed to be a channel of economic growth. Therefore it is expected to have the same sign of GDP per capita. Burgoon (2006) and Kurrild-Klitgaard et al. (2006) find a negative association between the openness of a country and the number of incidents in a sample of countries.

Third, with regard to political variables, first we consider the current fractionalization of electoral votes between political parties. The electoral fractionalization is captured by means of the Rae index of electoral fractionalization as computed by

Armingeon et al. (2009). It is defined as $rae_{ele} = 1 - \sum_{i=1}^{m} v_i^2$, where v_i is the share of votes for party i and m the number of parties. The index of electoral fractionalization decreases in the concentration of electoral votes. The Rae index reaches its maximum only in the presence of an infinite number of equally supported parties. Another variable captures the number of right-wing parties in percentage of total cabinet posts. Koch and Cranmer (2007) found confirmation of the so-called "Dick Cheney" Hypothesis according to which left wing governments attract more terrorism than right-wing governments. Other political variables considered are (i) duration of polity and (ii) the rate of voter turnout.

The second empirical model will rely on the same variables. In fact, as noted earlier in the previous section, since all western European countries exhibit very high levels of schooling and education, we are not investigating directly this relationship. In fact, given the education systems in all western European countries (which spans on average 10 years of compulsory schooling), there are no significant differences in the levels of schooling across Europe (as it was also clear from Table 3.1). Instead, we have to refer to different economic variables which either directly or indirectly might be related to the idea of the productivity argument. In this view, GDP per capita is expected to be positively associated with the brutality of terrorism. The main control variables, their descriptive statistics and their sources are shown in Table 4.1 and pair wise correlations are presented in Table 4.2.

5. Explaining the emergence of terrorist events: Rival explanations?

Hereafter, in this section we examine first the socio-economic determinants of terrorism. That is, this section is intended to explain the causes of emergence of terrorism. We analyze this by using the following panel data model:

$$terr_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 I_{it} + \varepsilon_{it} \quad (1)$$

where *terr* is the log of number terrorist incidents in country $i = 1, \ldots, 12$ at time $t = 1994, \ldots 2007$. X and I are respectively the set of economic and political variables which have been presented in the previous section and listed in Table 3.1. The dependent variable is a count data, and therefore, the econometric specification is a panel negative binomial regression. The fixed effect estimator is applied. The results are presented in Table 5.1.

First of all, our results show a robust negative and statistically significant relationship between the structural economic conditions and the incidence of terrorism and political violence. The GDP per capita is negatively associated with the emergence of terrorism and political violence, and is robust using various specifications. The magnitude of the estimated coefficient is also relevant. For instance in the baseline specification of column 1, if GDP per capita increases by 1% the relative change in the expected number of terrorist incidents decreases by 3.5%. In columns 6 and 7 (once the political covariates have been added) the coefficients are even higher. That is, if GDP per capita increases by 1% the relative change in the expected number of terrorist incidents decreases by 5.5%. Moreover, in the other specification coefficients for growth rate of real GDP per capita, labor productivity and degree of openness also confirm this result: (i) an increase by 1% of GDP growth rate is associated with a decrease of around 1.64% in the expected number of terrorist incidents; (ii) an increase of 1% of labor productivity is associated with a decrease of slightly less than 5%; (iii) an increase of 1% of degree of openness is associated with a decrease in the expected number of terrorist incidents which vary from 1% to 1.5% . That is, the first broad explanation which turns to be evident is that in western European countries the classical economic argument of opportunity cost seems to be confirmed. That is, the larger is the set of economic opportunities for individuals the lower is the likelihood or the willingness for them to be involved in a terrorist activity. In simpler words, the higher is the level of well-being the lower is the probability of terrorist activity in some territories. That is, these findings also support the economic deprivation argument.

However, second, there are some findings which, *ceteris paribus*, seem to confirm the hypothesis highlighted by immiserizing modernization theory. In columns 3, 4 and 5 there is a robust positive association between the share of investments in real GDP per capita and the number of terrorist incidence. More precisely, an increase of 1% in the investment share in real GDP is associated with an increase of around 3% in the expected number of terrorist incidents. This suggests that another interpretation can be produced when considering future economic scenarios. In fact, the investment share captures somehow the expected future economic growth. That is, in simpler words, the higher is the investment share of real GDP per capita today, the higher is assumed to be the economic growth tomorrow. This is confirmed also by the negative association between the incidence of terrorism and the long-term interest rate which discourages current investments. In sum, expected future economic growth is associated with an increase in current terrorist activity. Put differently, individuals perceive that the economic environment is likely to change. This may trigger the feeling which would confirm the immiserizing modernization theory.

Eventually, this positive association between the changing economic environment and the incidence of terrorism and politically motivated violence is also confirmed when analyzing with the positive correlation with youth unemployment. In columns 4 and 5 of Table 5.1, results show that an increase of 1% in youth unemployment translates into a 0.5% increase in terrorist activity. That is, frustration and poor expectations about future economic prosperity of youth also seem to fuel terrorist activity.

Third, with regard to political variables, the results highlight some peculiar factors. There is also a positive association between current fractionalization of electoral votes between parties and the incidence of terrorism. That is, the higher is the Rae index of electoral fractionalization, the higher is the number of terrorist incidents. The index of electoral fractionalization decreases in the concentration of electoral votes. The Rae index reaches its maximum only in the presence of an infinite number of equally supported parties. In simpler words, the higher is the current political fragmentation, the higher is the expected number of terrorist incidents. Moreover, the higher is the number of right-wing parties in percentage of total cabinet posts, the higher is the number of terrorist incidence. However, the latter results might be misleading at this stage because of simultaneity or also reverse

Table 4.1
Main control variables, sources and descriptive statistics.

Description	Source	Obs.	Mean	Std. Dev.	Min	Max
Real GDP per capita (logged)	Penn world tables	2579	10.091	.117	9.75	10.49
Investment share of real GDP per capita (logged)	Penn world tables	2694	3.261	.162	2.996	3.661
Growth rate of real GDP per capita (logged)	Penn world tables	2666	.705	.859	−1.787	2.414
Unemployment rate (logged)	ILO-KILM	2693	2.285	.416	.200	3.183
Youth unemployment rate (logged)	ILO-KILM	2695	2.987	.478	1.481	3.759
Inflation rate (logged)	IMF	2694	4.566	.076	4.323	4.839
Labor productivity GDP per hour worked (constant 1990 US$ at PPP) [logged]	ILO-KILM	2694	3.21	.195	2.667	3.555
Openness (logged)	Penn world tables	2694	3.853	.216	3.589	5.144
RAE index of electoral fractionalization	Armingeon et al.	1913	70.482	5.382	62.032	90.28
Duration of polity	Polity IV	2694	3.443	.937	1.386	5.056

Table 4.2
Pairwise correlations.

	Terrorist incidents	GDP per capita	Investment share of real GDP per capita	Growth rate	Inflation	Unemployment	Youth unemployment	Productivity	Openness	Long term Interest Rate	Duration of Polity	Rae Index	Voter turnout	Right govt.
Terrorist incidents	1													
GDP per capita	−0.365	1												
Investment share of real GDP per capita	−0.213	0.2633	1											
Growth rate	−0.063	−0.1459	0.0844	1										
Inflation	−0.271	0.6503	0.2805	0.0316	1									
Unemployment	0.3345	−0.5469	−0.1755	−0.0998	−0.1376	1								
Youth unemployment	0.2562	−0.6775	−0.0352	0.1554	−0.1419	0.7403	1							
Productivity	−0.1370	0.6700	−0.1394	−0.2246	0.3558	−0.1421	−0.2921	1						
Openness	−0.4656	0.5821	0.2036	0.1383	0.2784	−0.5962	−0.4536	0.3990	1					
Long term interest rate	0.3015	−0.7112	−0.2818	0.1107	−0.6856	0.3011	0.3697	−0.2980	−0.3118	1				
Duration of polity	−0.2591	0.4153	−0.0554	−0.0060	0.1107	−0.5515	−0.3380	0.2345	0.3861	−0.1934	1			
Rae index	−0.1337	0.3578	0.0565	−0.3264	−0.0651	−0.1049	−0.1000	0.6338	0.4077	−0.0742	0.2655	1		
Voter turnout	0.0074	−0.3425	−0.2056	0.2102	−0.0056	0.4653	0.4119	0.0399	0.0654	0.3433	−0.4488	−0.1044	1	
Right govt.	0.0479	0.3539	0.2531	−0.0133	0.2981	−0.3926	−0.2119	0.1727	0.2817	−0.2060	0.2971	0.1254	−0.2404	1

Table 5.1
Dependent variable: number of terrorist incidents (panel negative binomial regression).

	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
	1	2	3	4	5	6	7	8	9	10
GDP per capita	**−3.46*****	**−2.56***				**−5.51*****	**−5.54*****			
	(1.25)	(1.504)				(1.345)	(1.82)			
Investment share of real GDP per capita			**3.06*****	**2.64*****	**2.69*****			1.43	1.32	
			(.98)	(.977)	(.881)			(1.032)	(.984)	
Growth Rate			−.128	−.151				**−.145***	**−.164****	**−.16***
			(.095)	(.099)				(.088)	(.089)	(.091)
Inflation	−.002	−.009	**−.076*****	**−.07*****	**−.041*****	−.02	−.018	**−.05*****	**−.047*****	**−.04****
	(.015)	(.016)	(.016)	(.015)	(.011)	(.02)	(.022)	(.0187)	(.018)	(.016)
Unemployment	.10		−.022			**−.60***		.−26		
	(.265)		(.320)			(.356)		(.384)		
Youth Unemployment		.389		**.55****	**.50*****		−.02		.51	.44
		(.341)		(.30)	(.281)		(.402)		(.33)	(.311)
Productivity					**−1.75*****			**−4.90*****	**−4.79*****	**−4.93*****
					(.704)			(1.066)	(1.036)	(.984)
Openess	−.57	−.55	**−1.46*****	**−1.09*****	−.69	**−1.14****	−.73	**−1.47*****	−.89	**−1.12****
	(.484)	(.477)	(.467)	(.462)	(.471)	(.60)	(.564)	(.591)	(.596)	(.505)
Long-term interest rate			−.038	−.06		**−.12****	**−.13****	−.097	**−.10***	**−.12****
			(.54)	(.053)		(.066)	(.063)	(.061)	(.58)	(.058)
Duration of Polity						−.241	−.051	−.021	.014	
						(.265)	(.235)	(.274)	(.263)	
Rae index of electoral fractionalization						**.05****	**.046****	**.083*****	**.076*****	**.086*****
						(.022)	(.025)	(.029)	(.028)	(.027)
Voter Turnout						−.02	−.44	.083	−.915	
						(1.156)	(1.112)	(1.4127)	(1.395)	
Right govt%						**.007*****	**.007*****	**.007*****	**.008*****	**.007*****
						(.0025)	(.003)	(.003)	(.0028)	(.002)
Const	**37.79*****	**28.33****	4.18	2.18	2.73	**62.28*****	**60.86**	**17.34*****	**17.42*****	**17.78*****
	(10.99)	(13.98)	(3.76)	(3.79)	(3.37)	(13.83)	(17.98)	(7.48)	(7.322)	(3.47)
Obs	168	168	155	155	168	164	164			155
Groups	12	12	12	12	12	12	12	12	12	12
Log Likelihood	**−415.34**	**−414.774**	**−371.60**	**−369.93**	**−407.142**	**−388.17**	**−389.57**	**−359.03**	**−358.07**	**−359.184**

For the sake of readability statistically significant coefficients are in bold.
*** Significant at 1%.
* Significant at 10%.
** Significant al 5%.

causality. Other political variables as duration of polity and the rate of voter turnout do not show any significant relationship with the number of terrorist incidents.

To sum up, what can be highlighted is that economic deprivation and *immiserizing modernization* theories both hold for western European countries. In fact, it seems that when considering current economic activity the economic deprivation theory holds. Instead, the modernization theory seems to hold when agents take into account future economic trends.

6. Explaining brutality of terrorist events

In this section, we analyze the second hypothesis of our paper. That is, whether or not is it possible to infer some economic determinants for terrorist brutality. The following model is intended to explain the brutality of terrorist activities.

$$vict_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 I_{it} + \varepsilon_{it}. \quad (2)$$

The dependent variable *vict* which has been assumed to proxy the brutality of terrorists is the log of the number of victims of actual incidents. The number of victims is computed as the sum of injured and dead people in country $i = 1, \ldots, 12$ at time $t = 1994, \ldots 2007$. All incidents are ordered by date within the same year. Needless to say, the number of incidents differs widely across years. However, it must be noted that in our sample the great majority of incidents present zero victims (2068 out of 2696). Even on this case a negative binomial regression has been applied. Table 6.1 reports the results of regressions which are intended to explain the brutality of terrorism.

The first important result is that the number of victims is increasing in GDP per capita as well as in the growth rate of GDP per capita. In particular, in columns 2 and 8, a 1% increase in GDP per capita is associated with an increase of around 3.5% in the expected number of victims. In columns 3–6, the growth rate of real GDP per capita is positively and significantly associated with the number of victims. In particular, a 1% increase in growth rate translates into a .3–.4% increase in the number of victims. The positive association between terrorist brutality and GDP per capita may reflect the idea according to which terrorists in high-

Table 6.1
Dependent variable: number of victims per incident (panel negative binomial regression).

	FE	FE	FE	FE	FE	FE	FE	FE	FE	FE
	1	2	3	4	5	6	7	8	9	10
GDP per capita	.313	**3.41*****					1.61	**3.68*****		
	(.818)	(.716)					(1.08)	(.880)		
Investment share of real GDP per capita			**−1.60*****	**−2.43*****	**−1.39*****	**−2.27*****			−.522	**−1.64*****
			(.372)	(.292)	(.396)	(.317)			(.654)	(.579)
Growth rate of real GDP per capita			**.336*****	**.319*****	**.377*****	**.355*****			**.204****	**.17***
			(.069)	(.068)	(.075)	(.074)			(.107)	(.105)
Inflation	**−3.60*****	**−5.70*****	**−2.13*****	**−1.28***	**−2.86*****	**−1.86****	**−5.33*****	**−6.88*****	**−4.21*****	**−3.09*****
	(1.094)	(1.091)	(.813)	(.786)	(.958)	(.913)	(1.41)	(1.37)	(1.191)	(1.146)
Unemployment	**−.958*****	−.100	**−.604*****		**−.618*****		**−.53*****		**−.656*****	
	(.141)	(.086)	(.159)		(.159)		(.181)		(.1807)	
Youth unemployment				−.10		−.101		.016		−.021
				(.088)		(.087)		(.092)		(.0921)
Productivity					.617	.526			.739	.656
					(.405)	(.403)			(.542)	(.541)
Openness				**1.17*****	.511	**1.16*****			.229	**1.10*****
				(.285)	(.352)	(.284)			(.456)	(.365)
Duration of polity							**.32*****	**.415*****	**.17***	.152
							(.063)	(.055)	(.100)	(.104)
Rae index of electoral fractionalization							.000	.001	.001	.001
							(.009)	(.009)	(.009)	(.009)
Const	**13.06*****	**−10.53*****	**11.51*****	**6.79*****	**12.28*****	**7.25*****	5.77	**−9.79****	**15.97*****	**10.00*****
	(5.31)	(4.23)	(3.204)	(2.97)	(3.31)	(3.03)	(6.94)	(4.85)	(4.00)	(3.647)
Obs	2579	2579	2665	2666	2665	2666	1860	1860	1897	1897
Groups	12	12	12	12	12	12	12	12	12	12
Log likelihood	−2599.63		−2605.15	−2612.08	−2603.99	−2611.22	−2046.09	−2050.32	−2054.69	−2061.40

For sake of readability statistically significant coefficients are in bold.
*** Significant at 1%.
** Significant al 5%.
* Significant at 10%.

income countries are supposed to be terrorists able to carry out bloody attacks. In other words, in high-income countries as western European countries, terrorists can be assumed to be highly 'productive'. All the variables which contribute to current economic growth present coefficients in line with this point. In sum, brutality of terrorists is expected to be higher in the presence of higher economic development.

Brutality of terrorists is also positively associated with the duration of polity. This suggests that in the presence of a durable and persistent polity, terrorists are likely to be more brutal in order to gain more attention and support from population. This is also partly confirmed by the positive relationship between the degree of openness and the brutality of terrorist incidents. At the same time, the negative association with the investment share of GDP per capita is probably explained along the line of a reverse causality. That is, it would be predictable that investments decrease in brutality of terrorism because of the feeling of uncertainty it spreads.

7. Conclusions

The goal of this paper was twofold: first, to empirically investigate the economic and socio-political causes of the number of terrorist attacks and second, to explain political violence and terrorist brutality (number of people killed) again with economic and non-economic variables for the 12 countries of Western Europe from 1994 to 2007. As usual, the econometric/empirical results of this panel estimation are mixed.

First, our results clearly demonstrate that in western European countries the classical economic argument of opportunity cost can be confirmed; i.e. the larger the set of economic opportunities for an individual, the lower the likelihood or the willingness for her/him to be involved in terrorist activities. Put differently, it can be stated that the larger is the set of economic opportunities for an individual, *ceteris paribus*, the lower must be her or his involvement in unproductive (or even destructive) activities. However, as we noted earlier, the opportunity cost argument can take different shapes. In fact, it can support both *immiserizing modernization* theory and *economic deprivation* theory. In particular, it has been argued that the first captures a perception of opportunity cost which takes shape while considering future economic (and non-economic) rewards and their expected difference with desired payoffs. Eventually, the latter argument is based upon an opportunity cost which takes into account past economic opportunities and rewards. That is, at a certain point in time, individuals evaluate the current set of actual economic payoffs so evaluating whether or not they increased their own utility. Briefly, the *immiserizing modernization* argument is structured around the concept of future opportunity cost whereas the *economic deprivation* theory is structured around the concept of current opportunity cost. Eventually, a novelty we would claim for this work is that we explicitly take into account both theories in relation with terrorism and political violence in Europe.

Empirical results are mixed. In the baseline specification, if GDP per capita increases by 1% the relative change in the expected number of terrorist incidents decreases by 3.5%. Once the political covariates have been added the coefficients are even higher. That is, if GDP per capita increases by 1% the relative change in the expected number of terrorist incidents decreases by 5.5%. These findings support the economic deprivation argument. However and second, as well as in line with *immiserizing modernization* theory, expected future economic growth is positively associated with an increase in current terrorist activities. More precisely, an increase of 1% in the investment share in real GDP is associated with an increase of around 3% in the expected number of terrorist incidents. This is confirmed also by the negative association between the incidence of terrorism and the long-term interest rate which discourages current investments. Eventually, this positive association between the changing economic environment and the incidence of terrorism and politically motivated violence is also confirmed when analyzing the positive correlation with youth unemployment. Findings show that an increase of 1% in youth unemployment translates into a .5% increase in terrorist activity. That is, frustration and poor expectations about future economic scenarios also can fuel terrorist activity.

Third, our econometric findings demonstrate that terrorist brutality (measured in victims per accident) is positively associated with real GDP per capita. Brutality of terrorists is also associated with the duration of polity; i.e. in the presence of a durable and persistent polity, terrorists are likely to be more brutal in order to gain more attention.

Acknowledgment

We are grateful for comments from two anonymous referees and from Arye L. Hillman.

References

Abadie, A., 2006. Poverty, political freedom and the roots of terrorism. The American Economic Review, Papers and Proceedings 96, 50–56.
Alesina, A., Perotti, R., 1996. Income distribution, political instability, and investment. European Economic Review 40, 1203–1228.
Armingeon, K., Potolidis, P., Gerber, M., Leimgruber, P., 2009. Comparative Political Dataset I 1960–2007. Institute of Political Science, University of Bern.
Benmelech, E., Berrebi, C., 2007. Human capital and the productivity of suicide bombers. The Journal of Economic Perspectives 21, 223–238.
Bernholz, P., 2004. Supreme values as the basis for terror. European Journal of Political Economy 20, 317–333.
Berrebi, C., 2007. Evidence about the link between education, poverty and terrorism among Palestinians. Peace Economics, Peace Science and Public Policy 13 (2) http://www.bepress.com/peps/vol13/iss1/2.
Blomberg, S.B., Hess, G.D., Weerapana, A., 2004. Economic conditions and terrorism. European Journal of Political Economy 20, 463–478.
Bohlken, A.T., Sergenti, E.J., 2010. Economic growth and ethnic violence: an empirical investigation of Hindu–Muslim riots in India. Journal of Peace Research 47, 589–600.
Borooah, V.K., Paldam, M., 2007. Why is the world short of democracy? A cross-country analysis of barriers to representative government. European Journal of Political Economy 23, 582–604.
Boulding, K.E., 1973. The Economy of Love and Fear. Wadsworth Publishing Company, Belmont.
Boulding, K.E., 1989. The Three Faces of Power. Sage, Newbury Park CA.

Brush, S.G., 1996. Dynamics of theory change in the social sciences. The Journal of Conflict Resolution 40, 523–545.
Bueno de Mesquita, E., 2005. The quality of terror. The American Journal of Political Science 49, 515–530.
Burgoon, B., 2006. On welfare and terror: social welfare policies and political–economic roots of terrorism. The Journal of Conflict Resolution 50, 176–203.
Caruso, R., Schneider, F., 2010. Al Qaeda and Jihadist Terrorism in the light of contest theory: a theoretical note and empirical evidence over the period 2002–2007. Paper presented at the Jan Tinbergen European Peace Science Conference 2009.
Crenshaw, M., 1981. The causes of terrorism. Comparative Politics 13, 379–399.
Dutt, P., Mitra, D., 2008. Inequality and the instability of polity and policy. The Economic Journal 118, 1285–1314.
Enders, W., Sandler, T., 2006. The Political Economy of Terrorism. Cambridge University Press, Cambridge U.K.
Fielding, D., Shortland, A., 2010. An eye for an eye, a tooth for a tooth, political violence and counter-insurgency in Egypt. The Journal of Peace Research 47, 433–447.
Freytag, A., Kruger, J.J., Schneider, F., 2008. The origins of terrorism, cross country estimates on socio economic determinants of terrorism. Paper presented at the second NEAT workshop, Bruxelles, September 2008.
Gundlach, E., Paldam, M., 2009. A farewell to critical junctures: sorting out long-run causality of income and democracy. European Journal of Political Economy 25, 340–354.
Gurr, T.R., 1968. Psychological factors in civil violence. World Politics 20, 245–278.
Gurr, T., 1970a. Why Men Rebel. Princeton University Press, Princeton NJ.
Gurr, T., 1970b. Sources of rebellion in western societies: some quantitative evidence. The Annals of the American Academy of Political and Social Science 391, 128–144.
Hillman, A.L., 2007. Economic and security consequences of supreme values. Public Choice 131, 259–280.Reprinted 2008 as: An economic perspective on radical Islam. In Frisch, H., Inbar, E. (Eds.), Radical Islam and International Security: Challenges and Responses, Routledge, London, pp. 44–69.
Honaker, J., 2010. Unemployment and Violence in Northern Ireland: a missing data model for ecological inference. Paper presented to QuaSSI, Penn State, February 2010.
Kirchgässner, G., 2010. On minimal morals. European Journal of Political Economy 26, 330–339.
Koch, M.T., Cranmer, S., 2007. Testing the "Dick Cheney" hypothesis: do governments of the left attract more terrorism than governments of the right? Conflict Management and Peace Science 24, 311–326.
Krieger, T., Meierrieks, D., 2010. What causes terrorism? Public Choice on line first at www.springerlink.com/content/aw776631764g1m66/. doi:10.1007/s11127-010-9601-1.
Krueger, A.B., 2008. What makes a homegrown terrorist? Human capital and participation in domestic Islamic terrorist groups in the U.S.A. Economic Letters 101, 293–296.
Krueger, A.B., Maleckova, J., 2003. Education, Poverty and Terrorism, Is there a Causal Connection? The Journal of Economic Perspectives 7, 119–144.
Kurrild-Klitgaard, P., Justesen, M.K., Klemmensen, R., 2006. The political economy of freedom, democracy and transnational terrorism. Public Choice 128, 289–315.
Kuznets, S., 1955. Economic growth and income inequality. The American Economic Review 45, 1–28.
Lenin, W.I., 1901. What is to be Done?available at http://marxists.org/archive/lenin/works/1901/witbd/index.htm 1901.
Lipset, S.M., 1959. Some social requisites of democracy: economic development and political legitimacy. The American Political Science Review 53, 69–105.
Muller, E.N., Weede, E., 1990. Cross-national variation in political violence: a rational action approach. The Journal of Conflict Resolution 34, 624–651.
Murshed, S.M., Gates, S., 2005. Spatial-horizontal inequality and the Maoist insurgency in Nepal. Review of Development Economics 9, 121–134.
O'Higgins, N., 1997. The challenge of youth unemployment. Employment and Training Papers. ILO, Geneva.
Olson, M., 1963. Rapid growth as a destabilizing force. The Journal of Economic History 23, 529–552.
Oyefusi, A., 2010. Oil, youths, and civil unrest in Nigeria's Delta. Conflict Management and Peace Science 27, 326–346.
Patil, G.P., Taillie, C., 1982. Diversity as a concept and its measurement. Journal of the American Statistical Association 77, 548–561.
Piazza, J.A., 2006. Rooted in poverty? Terrorism, poor economic development, and social cleavages. Terrorism and Political Violence 18, 159–177.
Potrafke, N., 2010. Islam and DemocracyPublic Choice on line first at www.springerlink.com/content/848n4x6145j5k661/2010. doi:10.1007/s11127-010-9741-3.
Ray, D., 2010. Uneven growth: a framework for research in development economics. The Journal of Economic Perspectives 24, 45–60.
Sandler, T., Tschirhart, J.T., Cauley, J., 1983. A theoretical analysis of transnational terrorism. The American Political Science Review 77, 36–54.
Sayre, E., 2009. Labor market conditions, political events, and Palestinian suicide bombings. Peace Economics, Peace Science and Public Policy 15 (1) http://www.bepress.com/peps/vol15/iss1/1.
Schmid, A.P., 2004. Frameworks for conceptualizing terrorism. Terrorism and Political Violence 16, 197–221.
Schneider, F., Bruck, T., Meierrieks, D., 2010. The economics of terrorism and counter-terrorism: a survey (Part I). CESifo working paper n.3011. CESifo, Munich.
Shannon, C.E., Weaver, W., 1949. The Mathematical Theory of Communication. The University of Illinois Press, Urbana IL.
Shugart II, W.F., 2006. An analytical history of terrorism, 1945–2000. Public Choice 128, 7–39.
Sofranko, A.J., Bealer, R.C., 1973. Modernization balance, imbalance and domestic instability. Economic Development and Cultural Change 22, 52–72.
Urdal, H., 2006. A clash of generations? Youth bulges and political violence. International Studies Quarterly 50, 607–629.
Venieris, Y.P., Gupta, D.K., 1983. Sociopolitical and economic dimension of development: a cross section model. Economic Development and Cultural Change 31, 727–756.
Weinberg, L., Pedahzur, A., Hirsch-Hoefler, S., 2004. The challenges of conceptualizing terrorism. Terrorism and Political Violence 16, 777–794.
White, J.W., 1989. Economic development and sociopolitical unrest in nineteenth-century Japan. Economic Development and Cultural Change 37, 231–260.