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AL QAEDA AND JIHADIST TERRORISM IN THE LIGHT OF CONTEST THEORY
A THEORETICAL NOTE AND EMPIRICAL EVIDENCE OVER THE PERIOD 2002-2007[1]

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Abstract: *This paper shows that the number of victims of al-Qaeda-style terrorist attacks is significantly associated with the number of victims of previous attacks. Given the existence of several jihadist groups in many countries, such evidence is interpreted in the light of contest theory as the outcome of a competition between them. Namely increasing brutality of terrorist incidents would depend on competition between groups which are willing to gain the highest possible reputation. To maximize their own probability of winning some 'prize' provided by al Qaeda, would-be terrorist groups maximize their efforts with the result of escalating brutality. In the presence of costless information each candidate group can easily observe the results of attacks of other groups. Therefore, each group tries to make attacks at least equally destructive as the foregoing attacks. However, results show that preconditions for terrorist activity have to be found within grievance for socio-economic conditions.*

Keywords: Terrorism, al Qaeda, Contest Theory, Tournament, Information.

JEL CODES: D72, D74, J49, D8, D62, H4.

Introduction

Recent studies focus on economic determinants of terrorism activities. From a first point of view, some scholars emphasize the socio-economic roots of terrorism. This recalls the classical economic concept of opportunity cost. That is, the higher are the gains of an individual from participating into an ordinary productive activity the less he or she is willing to be engaged in terrorist activities. Therefore, better socio-economic scenarios would reduce the likelihood of terrorism. Moreover, would-be terrorists would be also motivated by grievance because of lack of civil liberties and existence of autocratic governments. This idea appears to be challenged by several studies which in the latest years 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. In particular, since in poorest countries education and literacy levels are quite low, the productivity argument is also produced in order to rule out the opportunity cost argument.

The present work complements the existing literature. The paper espouses and tests a different and complementary theoretical approach. That is, al Qaeda-style terrorist activity is interpreted in the light of contest theory. In this view, al Qaeda may be portrayed as a contest organizer providing an indivisible prize to the best terrorist group. Hence, these candidate cells compete with each other trying to maximize the number of casualties. In the eyes of economists, agents – namely the would-be terrorist groups – play à la Nash and maximize their efforts in order to win the prize provided by al Qaeda. In particular, in the presence of costless information each group observes the results of some previous attacks. Hence in order to maximize its own probability of winning the prize, each group (while maximizing its effort) tries to make attacks at least equally destructive as the foregoing attacks perpetrated by competing groups. This theoretical hypothesis is eventually confirmed by means of an empirical analysis which shows that the number of victims of terrorist incidents is significantly and positively associated with the number of victims of the previous incident in the same country. In the light of contest theory, would-be terrorists are supposed to compete with each other to prove their commitment and ability. This somehow also falls within the idea of reinforcement of terrorist activity as expounded by Midlarsky et al. (1980) which explains why there is a recurrence of terror within the same country[2]. At the same time analogies can be drawn with political violence in Italy in seventies. As explained by Della Porta (1992), competition between small groups contributed to radicalization of political violence. In particular, albeit grounded on very similar idelogical basis, small groups were willing to improve *"their specific relevance within their environment".*[3] Similar explanation has been provided by Blooom (2004) with regard to suicide bombing of palestinian militants.

The present work is not focused on terrorism in general. It is focused on jihadist offspring of Al Qaeda. In particular, the study focuses on the plethora of would-be terrorist groups which emerged in the latest years. Such phenomenon has been also widely defined as 'Global Jihadism' or 'Al Qaedism'. Shortly, in several countries, new terrorist groups emerged. These groups, may have not been formally part of al-Qaeda

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[2] Midlarsky et al. (1980) maintain that the temporal and spatial distribution of terrorist incidents can follow four possible patterns: (1) randomness; (2) heterogeneity (3) contagion, and (4) reinforcement.
[3] See Della Porta (1995) p. 110.

but they have espoused al-Qaeda's vision and strategy[4]. Hence, in the following empirical application, the sample selection has been based upon a selection of attacks which fit the Al Qaeda's *modus operandi* and ideology. Moreover, the sample includes mainly countries where the Sunni radicalism of Al Qaeda emerged in the latest recent years. In some cases, would-be terrorists have been also effectively defined 'self starters', i.e. groups perpetrating terrorist attacks on their own initiative This kind of phenomenon has been occurring in the last few years, thanks to the peculiar organization of Al Qaeda which had been defined as a 'network' or a 'movement', in order to highlight the nature of an entity less structured than traditional terrorist organisations. Therefore, assuming that the glue that binds the global 'jihadism' is ideological, this study analyses those terrorist events which must have been perpetrated by Sunni fundamentalists which espouse a Wahhabi version of Islam. This also marks a clear-cut distinction between jihadist terrorism and other form of terrorism. Not surprisingly, the composition of the sample is 'global' (mainly South Asian, Central Asian, Caucasian, African countries are included). The sample does not include countries or regions as Israel, Gaza Strip, Lebanon or Iraq. In fact, in Israel, West Bank, Gaza and Lebanon, there is no need of a tournament to select a terrorist champion. Shortly, Palestinian terrorist organisations are well-established and have been lasting for years. In Iraq, the scenario is puzzled. First, many observers agree that resistance against U.S. military forces and terrorist activities must be disentangled. Moreover, the contextual rivalry between Shia and Sunni groups also makes the picture more complex.

In brief, all the foregoing points clearly make the analysis peculiar and focused on jihadist groups which have been developing in the latest years. The dependent variable of the empirical application, is the number of victims and not the incidence of terror in itself. In fact, the number of victims proxies contextually the productivity as well as the incidence of terror. Following the interpretation in the light of contest theory, the testable implication would be that *the number of victims of jihadist attacks is significantly associated to the number of victims of past attacks*. Resulting evidence confirms the hypothesis. However, results show that al Qaeda-style jihadist terrorist activity depends also upon grievance for poverty and socio-economic conditions.

The paper is structured as follows: in a first paragraph we present a selection of recent empirical contributions. In a second section, a narrative theoretical argument is expounded. In a third section, the empirical application is developed. Eventually, in the last section, results are summarised and some conclusions are presented.

1. A selection of empirical studies

Hereafter, we present a selection of empirical studies on the determinants of terrorism. A first argument in the recent literature refers to the classical economic argument of *opportunity cost*. That is, the larger is the set of economic opportunities for an individual the lower is the likelihood or the willingness for him 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. Consequently, low-income and poorest countries would be the natural incubators of terrorism. A second argument which can be defined as a *productivity argument* stresses the positive relationship between education and terrorist activity. That is, better educated individuals would also become more productive and bloodier terrorists. Among scholars, opportunity cost and

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[4] See among others Rabasa et al. (2006) and Napoleoni (2005).

productivity arguments are commonly cited as they would be opposite theories. In particular, since in poorest countries education and literacy levels are quite low, the productivity argument is also produced in order to rule out the opportunity cost argument. However, at a deeper reading, the two arguments are not necessarily on opposite sides. They can complement each other. In fact, the opportunity cost argument could determine the '*why*' whereas the productivity argument can determine the '*how*'. In addition, the opportunity cost argument is often complemented by a focus on institutional and political atmosphere where terrorist activities take place. In non-democratic countries, the lack of opportunities for political participation induces political grievances, fuelling terrorism. Hence, in many studies a linkage between democracy and terrorism is often investigated. In any case, they can be considered *preconditions* for terrorism, namely «*factors that set the stage for terrorism over the long run[5]»,* as explained in Crenshaw (1981).

In recent years, a well-known study is Krueger and Maleckova (2003). The authors – with a special focus on Israel - first estimate the likelihood that someone can become a Hizbollah affiliate. By means of a logistic estimation, the authors show that a higher level of education is positively associated with the likelihood of becoming a Hizbollah militant. Eventually, the authors have estimated negative binomial regression models, where the dependent variable is the number of international terrorist events – defined as attacks involving citizens or the territory of more than one country. As noted above, albeit widely quoted by many other studies the study is not conclusive given that most coefficients are statistically insignificant. The main and more robust finding shows that terrorists are more likely to originate from larger countries. The only other significant estimation shows that terrorists come from poorest countries (that is, the countries falling within the bottom quartile of world distribution of GDP per capita). However, it is significant in only one out of four regressions. Blomberg at al. (2004) using the ITERATE database, analyse 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. Such a relationship is also studied in Li (2005) which analyzes the incidence of terrorist events in 11 countries over the period 1975-1997 and stresses the negative association between terrorism and democracy. The dependent variable is the annual number of transnational terrorist events that occur in a country whereas the explanatory variables are a bundle of political variables and few some economic factors as economic inequality and GDP per capita. The econometric estimation is a negative binomial regression. The main results of the study show that democracy and terrorism are negatively associated. Such association is robust and statistically significant. Instead a negative association between terrorism and GDP per capita is only weakly significant. The emphasis on polity is also the core of Drakos and Gofas (2006) that analyse the incidence of terrorist events in 153 countries over the period 1985-1998. According to the authors polity affects press freedom in a country. Therefore, the actual number of terrorist activities can be misreported in the presence of severe limitations to freedom of the press. The empirical application shows that the incidence of terrorist events is positively associated with polity score (namely incidence of terrorism is more likely in the presence of non-democracies). As covariates, the authors apply lagged values of

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[5] See Crenshaw (1981) p. 381.

terrorist incidence. They find a positive association between current an past level of terror.

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 the 1986 to 2002. The independent variables used in the analysis include a set of economic variables (HDI, GINI coefficient, GDP growth, inflation, unemployment), demographic variables (population and population growth, ethnic diversity), and political variables (number of parties, 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 characteristics national income is no longer associated with terrorism. That is, the analysis does not seem particularly robust. In particular, in the most conclusive OLS regression with 154 observations, the author shows that incidence of terrorism and GDP per capita are negatively associated, whereas the effect of political freedom is remarkably non-linear. In fact, the lack of political rights variable squared shows a negative and significant association with the incidence of terrorism is spite of a weakly significant positive association in the absence of the power squared exponent. Eventually, instrumental variables estimates confirm the qualitative results of OLS regressions. Burgoon (2006), analyses 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 trasnational 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). Results show that total social welfare spending is negatively and significantly associated with all measures of terrorism. Braithwhite and Li (2007) analyse the phenomenon of contagion of terrorist activities. In particular, they study the spatial clustering of terrorist incidents. They apply local spatial statistics to identify whether or not countries located within terrorism hot spot neighborhoods, are likely to experience terrorist attacks in the future. They find robust evidence in this respect under alternative definitions of geographical proximity.

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 years 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; (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.

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. They produce a productivity argument. In short, better educated people would more productive terrorist, i.e. able to spread more terror by killing more people. 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 ran by mean of a logistic regression where the dependent variable equals 1 if the individual is 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 percent 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 separate regressions, using a sub-sample of successful incidents (which reduces to the number of observations to 106) the authors show how the interaction terms (Age of suicide terrorist$\times$ Target) and (Education$\times$ Target) are positive and significant for the number of people killed. In their interpretation, older and better educated suicide bombers, when assigned to more important targets, are more effective killers. Jaeger and Paserman (2008) are intended to explain the cycle of violence between Israel and Palestinians. The sample period is from September 29, 2000, (when the Intifada began) to January 15, 2005, when Mahmoud Abbas assumed the presidency of the Palestinian Authority. Dependent variables in the empirical specification are given by fatalities of Palestinians and Israelis. In the period considered, the number of Palestinian fatalities is 3,244, whereas the number of Israeli fatalities reaches 994. By means of a VAR, the authors find evidence that the Israelis react in a significant and predictable way to Palestinian violence. However, there is no evidence that the Palestinians react to Israeli violence. It seems that Palestinian violence is pretty random. This contrasts the popular notion that the Israelis and Palestinians are engaged in a "tit-for-tat" cycle of violence. A complementary exaplanation is given (for the period 1991-2003) in Gupta and Mundra (2005). The authors show that palestinian suicide attacks are the outcome of an interaction between palestinian groups which is shaped by both cooperation and competition. For instance, previous PLO's incidents cause current attacks by Hamas and Islamic Jihad. Similarly, previous attacks by Hamas induce also attacks perpetrated by Islamic Jihad. However, palestinian suicide attacks are also a reaction to Israeli attacks.

Another interesting recent study is Fielding and Shortland (2009). It is focused on Islamist violence in Egypt which is widely acknowledged as an important incubator of Islamist terrorism. The authors investigate the interactions between Islamist insurgent and Egyptian security force activity by means of several probit and tobit regressions and a new dataset on political violence in Egypt for the period 1990-2000. They found evidence that a cycle of violence does exist. Namely, increased activity on one side is followed by increased activity on the other. Interestingly, in order to test the opportunity

cost argument the authors study the consequences of an increase in the price of bread on the number of casualties. 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. Moreover, another interesting result is the negative spillover effect of Palestinian Intifada in Gaza. When the number of Intifada fatalities increases, Egyptian casualties also increase.

A recent study also focused on Palestinian suicide bombers is Sayre (2009). It studies the relationship between Palestinian suicide bombings and the labour market conditions as well as other political factors over the period 1993-2004. In the empirical model – estimated by means of a negative binomial regression – the dependent variable is the number of suicide bombings per quarter originating from a particular Palestinian sub-district and the explanatory variables are: (a) the mean daily wage; (b) the rate of unemployment and (c) the occurrence of some important political event. Results show that the frequency of terrorist events is positively associated with a deteriorating economy. In short, it is in line with the opportunity cost argument.

The following empirical analysis is based upon a selection of attacks which fit the Al Qaeda style. This makes the analysis peculiar and focused on jihadist groups. That is, it cannot be compared with foregoing studies which did not disentangle behaviour of Al Qaeda cells from the complex and heterogeneous universe of terrorism. Secondly the dependent variable is the number of casualties and not the incidence of terror in itself. In fact, the number of victims proxies contextually the productivity as well as the incidence of terror.

TABLE 1 – SELECTION OF EMPIRICAL STUDIES.

AUTHOR(S)	JOURNAL	YEAR	PERIOD	REGIONS/COUNTRY	MODEL	DEPENDENT VARIABLE
Krueger and Maleckova	*Journal of Economic Perspectives*	2003	a) 1982-1994;b) 1997-2002	a) Israel/lebanon; b) 148 countries	a) Logistic; b) Negative binomial regression	a) probability of becoming a Hizbollah affiliated; b) number of international terrorist events
Blomberg, Hess and Weerapana	*European Journal of Political economy*	2004	1968-1991	127countries	Bivariate Markov Process	Incidence of terrorism as average annual incidence
Li	*Journal of Conflict Resolution*	2005	1975-1997	11 countries	Negative binomial regression	annual number of trasnational terrorist events
Gupta and Mundra	*Terrorism and Political Violence*	2005	1991-2003	Israel/PLO	a) Poisson QMLE; b) SUR	a) Incidence of Suicide attacks; b) number of suicide attacks
Drakos and Gofas	*Journal of Conflict Resolution*	2006	1985-1998	153 countries	Negative binomial regression	annual number of trasnational terrorist events
Piazza	*Terrorism and Political Violence*	2006	1986-2002	96 countries	OLS	a) incidence of terrorist attacks; b) casualty rate
Abadie	*American Economic review, Papers and Proceedings*	2006	2003-2004	186 countries	OLS	Index of Terrorist Risk (bounded between 10 and 100)
Burgoon	*Journal of Conflict Resolution*	2006	a) 1991-1998; b) 1998-2003; c) 1996-2001	100 countries	Negative binomial regression	(a) number of trasnational terrorist incidents in a country; (b) number of terrorist incidents in a country; (c) the number of significant transnational terrorist incidents by country of perpetrator(s).

Berrebi	*Peace Economics, Peace Science and Public Policy*	2007	1988-2002	Israel, West Bank and Gaza Strip	Logistic	probability for an individual to participate in Hamas or PIJ terrorist activities
Benmelech and Berrebi	*Journal of Economic Perspectives*	2007	2000-2005	Israel, West Bank and Gaza Strip	OLS	number of the people killed or injured in the attack
Braithwaite and Li	*Conflict Management and Peace Science*	2007	1975-1997	112 countries	Pooled time series	Negative Binomial regression
Freytag, Kruger and Schneider	*unpublished*	2008	1971-2005	95 countries	Poisson	number of terror incidents originating from a country during a five years span
Jaeger and Paserman	*American Economic review*	2008	2000-2005	Israel/PLO	VAR	fatalities of Palestinians and Israelis
Fielding and Shortland	*Journal of Peace Research*	2009	1990-2000	Egypt	Probit and Tobit	Civilians and Military Fatalities
Sayre	*Peace Economics, Peace Science and Public Policy*	2009	1993-2004	Israel/PLO	Negative binomial regression	number of suicide bombings per quarter

2. Al Qaeda in the light of contest theory.

As noted above, al Qaeda-style terrorist activity is analysed in the light of contest theory. This kind of interpretation has been also partly expounded in Caruso and Locatelli (2004/2008). A contest is commonly defined as a game in which players compete for a prize by making irreversible outlays. In other words, contests are situations in which rational agents spend resources in order to win a prize. The characteristic feature of this interaction is that resources are spent irreversibly[6]. In this view, al Qaeda may be portrayed as a contest organizer providing an indivisible prize to the best terrorist group. Bin Laden and his fellows may start a competition among different would-be terrorist groups which are only loosely related to terrorist network. The prize could be assumed to be a honourable membership as well as an economic reward[7]. Hence, these candidate cells compete with each other. Agents – namely the would-be terrorist groups – play à la Nash and maximize their efforts. In particular, all candidate groups may believe to be involved in a contest made by multiple rounds. How such interpretation could be defended?

It has always been a wide knowledge that al Qaeda does not retain a clear hierarchical line of command. In particular, this flexibility allows for a novel recruitment system. That is, In fact, even some recent work suggests that the recruiting process may now resemble a kind of voluntary application to join the organization[8]. In this view, new groups are involved in the organization as the result of a selection process amongst different volunteers (Sageman, 2004). The rise of the so-called "self starters" is taken as evidence of this, i.e. groups with little or no affiliation with the network perpetrating terrorist attacks on their own initiative (Kirby 2007, Sageman,

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[6] Traditional contest models are formally grounded on Tullock (1980), and found seminal explanations in O'Keeffe, Viscusi, Zeckhauser (1984); Rosen (1986); Dixit (1987). Recent excellent contributions are Moldovanu and Sela (2001) and Moldovanu et al. (2007). A comprehensive and recent study on contest theory is Konrad (2009).

[7] It is established that al Qaeda has given grants to local groups that devised promising plans for attacks.

[8] Cozzens (2005).

2008). In particular, attacks in Instanbul (November 2003), Madrid (March 2004), London (twice in July 2005) seemed to confirm the emergence of such phenomenon. This allows al Qaeda to extend its membership almost infinitely, simply because new groups can be affiliated at any time without an institutionalized recruitment procedure. It has also at least two significant advantages for al Qaeda. Firstly, there is no need for bin Laden and his fellows to invest resources in any recruitment drives. Secondly, and most importantly, such an abundance of applications would allow al Qaeda to be very selective in granting membership.

As noted above, contests are situations in which rational agents spend irreversibly resources in order to win a prize. This does constitute the main difference with auctions, in which agents do not bear the cost of the bids entirely by themselves. This is also the rationale for labelling contests as all-pay auctions. Literature on contests implies the concept of non-cooperative Nash equilibrium. Simple examples of contests can be drawn form sports. In a race, athletes cannot coordinate their actions and in the presence of an indivisible prize (call this winner-take-all contest) they will put in their maximum effort to win the prize. The optimal level of the effort exerted by every agent is strictly correlated to the value of the 'prize' – i.e. the higher the evaluation of the 'prize', the higher the commitment to put the maximum effort into the contest will be. Second, each agent knows that the probability of winning the contest is increasing in its own effort and decreasing in other players' efforts. That is, in the simplest case of two agents, A and B, the probability of agent A of winning the contest is higher when it makes a bigger effort than agent B. Therefore, the only feasible strategy for both A and B will be exerting the maximum possible effort. In a multi-agent scenario, however, the theory also predicts that total effort decreases in the number of contestants. That is, when agents are aware that the contest is joined by more agents, individual effort will decrease.

Of course, these general predictions about agents' behaviour can be considered as *ceteris paribus* conditions. In general, these properties hold even when other factors impact the effectiveness of efforts. For expository reasons, we can say that it is possible to indicate two candidate subsets of interacting factors: (a) individual characteristics; (b) exogenous characteristics. As individual characteristics, consider first the existence of different talents and abilities. Individuals as well as groups differ widely in terms of abilities. The idea of ability is 'somehow' *technological.* If you consider that a contest can be considered nothing but a production function of a monetary reward, then the efforts do constitute the 'inputs', whilst the abilities do constitute a technology translating a certain level of efforts into the probability of success. The impact of different abilities is clearer in the presence of a winner-take-all contest. Take again the example of the race. Since athletes are expected to put their maximum effort into the race, and given that their level of effort depends upon the value of the prize, they would make the same effort. In such a case, the outcome of the contest will be determined – everything else being equal – by abilities. Of course, abilities can be exogenously given and refer to personal talents given by nature, but they can also be related to some specific positive investments made by agents. Still, whatever the case, this does not really matter while analysing a contest. If they are not able to update their own abilities at different stages of the game, their efforts will be fruitless.

Of course, the design of the contest matters. That is, the agent providing the 'prize' of the contest can somehow modify the architecture of the contest in order to influence the total effort exerted. The simplest case is that of providing different prizes.

This is commonly the case with sport contests where prizes are offered for the winner but also for the runner-up. Moldovanu and Sela (2001) offer a brilliant theoretical contribution in this respect. They show that in the presence of concave cost functions, only one prize is the optimal design which does maximize efforts. By contrast, in the presence of convex cost functions, different prizes may constitute an optimal design. In fact, even if agents are aware that they cannot win the contest, they also expend the maximum effort to get the other prizes. This is the case in sports such as cycling, where different prizes are provided by organizers and then the total efforts of participants is maximized. By contrast, when the cost function is not convex only one prize leads to the best design. In such a case, the designer's objective is also maintained. The level of total effort is maximized. Offering only one prize guarantees that no player will give up. This is true in particular when players do not have information about other contestants' abilities.

A crucial point is represented by information. The simplest case refers to asymmetry in the evaluation of the prize. That is, without any public disclosure of information, agents can evaluate the 'prize' of a contest differently. Since the level of effort is positively correlated to the value of the prize, different evaluations of the stake lead to different levels of effort made by agents. Nti (1999) analyses the case of a contest where participants evaluate the 'prize' differently. The common result of this analysis is that agents that evaluate the stakes more highly make a bigger effort in the contest than low-evaluation participants. Hillman and Riley (1989) show that asymmetric evaluation deters participation by low-evaluation agents. Consider a contest with only two players, A and B, with identical abilities. If A retains a higher evaluation of the prize, it will exert itself more, and as a consequence will be the favorite. Agent B, the 'Underdog', will exert itself less. Therefore, increasing the favourite's valuation increases its effort, but decreases the effort of the underdog. This result may hold even if Agent B (the low-evaluation agent) has superior abilities.

Another crucial piece of information which is not publicly available is the number of contestants. Namely, participants do not know (at least not exactly) the number of contestants. As noted in Munster (2006) this also increases the total level of efforts exerted. Eventually, all the participants are privately informed about their abilities – in other words, each groups knows how much it can achieve, but is unaware of the others' potential. This, in turn, creates a favourable condition for the contest designer, since all groups are forced to give their best and maximize their efforts. In fact, in the first round of the tournament the competing groups can signal their commitment and ability. Therefore, this also increases the level of efforts exerted. This is modelled in Amegashie (2006) and Amegashie et al. (2006) that analyses elimination contests where all players do not save efforts in the first stage in order to signal their own ability to the other contestants.

This introduces a proper and necessary distinction between contests and tournaments. In fact, a tournament is nothing but a multi-stage contest. However, it has some implications with respect the availability of information. As expounded by Morgan and Vardy (2007), in a sequential tournament, it is the effectiveness of the first-movers effort that is revealed to the second mover, rather than the effort itself. That is, the second long jumper gets to observe the distance jumped by the first, but not the underlying effort that produced the jump. By contrast, in a sequential contest it is effort that is observable, while its ultimate effectiveness remains unobservable until the very end of the contest. In our context, the second terrorist candidate observes the outcome

of the first terrorist candidate. Once the efforts are exerted information becomes costless. When it comes to terrorist attacks, monitoring and information costs are close to zero: in fact, when a terrorist group bombs an embassy or a trade centre with dozens of casualties somewhere in the world, the event is extensively covered by international mass media[9]. In the presence of costless information acquisition, it is also possible to recall Dixit (1987) that points out that modelling difference between contests and tournaments has no sense when observation is costless. In the presence of costless information there is no difference between a contest and a tournament. Therefore, players could not save efforts and resources in different stages, they have to maximize efforts. Hereafter, given the costless information emerging after a terrorist attack, equivalence between contest and tournament can be assumed in our context.

3. Testable Implications and empirical strategy.

As noted earlier, in the presence of costless information there is no need of distinguishing between contest and tournament. Therefore, henceforth the terms 'contest' and 'tournament' will be used alternatively. Let us consider the jihadist tournament. Within this context, let us assume that each group – before perpetrating its own attack – observes the results of some previous attacks. Hence in order to maximize its own probability of winning the prize, each group (maximizes its effort) tries to make attacks at least equally destructive as the foregoing attacks. Simply, the testable implication is that: *the number of victims of jihadist attacks is related to the number of victims of past attacks.* A significant association would confirm the basic hypothesis of this work. The implicit limiting assumption is that if a tournament takes shape, it does at a national level. In such a way, the feasible interpretation is that al Qaeda would work in order to organise some 'national' champions. Perhaps, even if this is a conjecture, it is also possible that some terrorist groups behave spontaneously as they were in a national contest.

Data on terrorist incidents have been extracted from Global Terrorism Database GTD dataset [10]. The dataset is very detailed. Each record reports different characteristics of the incident. Then, it had been possible to filter the dataset in order to in order to consider only incidents fitting with al Qaeda's *modus operandi*. Therefore the records have been filtered according the following steps:

(1) each record had to report the Islamic extremist as perpetrator. In particular, only Sunni extremism has been considered;
(2) Incidents occurred in Israel, Gaza Strip, West Bank, Iraq and Afghanistan have been excluded;
(3) Each incident had to involve explosive devices (in particular IED, Improvised explosive device);
(4) Attacks to facilities have been excluded. For example, attacks to pipelines have been excluded;
(5) Assassinations of political leaders have been excluded even if an involvement of Islamist extremists has been reported;
(6) Attacks to shops, groceries and small business facilities have been excluded.

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[9] In a recent article Rohner and Frey (2007) demonstrated empirically that media attention and terrorism do mutually Granger cause each other.

[10] The dataset is downloadable at the address http://www.start.umd.edu/gtd/ (last access January 2010).

In order to understand the criteria and therefore the 'filters' used to manipulate the data, it is useful to refer to the 'Manchester Manual' which is considered as a 'handbook' for jihad. It was first found by British police in a raid in Manchester. It is currently available on line at the website of US Department of Justice [11]. Reading this document it is clear what must be the main targets of a terrorist cell and in particular among others (see p. 13 of the manual): (i) blasting and destroying the places of amusement, immorality and sin; (ii) blasting and destroying the embassies and attacking vital economic centers; (iii) assassinating enemy personnel as well as foreign tourists. In the manual, there is no mention of assassination of political leaders. At the same time, reading the manual it is clear that attack to shops and small business facilities are not included as well as the attacks to facilities as pipelines. Eventually, even on the basis on (1)-(6) and of (i), (ii) and (iii), the categories (as coded by GTD) of targets included in the sample are: (a) diplomat; (b) foreign business; (c) indiscriminate civilians/non combatants; (d) international; (e) US business; (f) US Diplomat; (g) US indiscriminate civilians/non-combatants; (h) US other.

Once the data has been filtered the total number of observations reduced to 589. Eventually, the sample estimation covers 23 countries over the period 2002 – 2007. The sample includes countries where the Sunni radicalism of Al Qaeda emerged in the latest recent years. As explained in the introduction the sample does not include countries as Israel, Gaza Strip, Lebanon or Iraq. In fact, in Israel, West Bank, Gaza and Lebanon, there is no need of a tournament to select a national champion. National champions already do exist. Shortly, Palestinian terrorist organisations are well-established and have been lasting for years. In Lebanon, the Hezbollah has been founded in Lebanon in 1982. Hamas has been founded in 1978 and launched the Jihad against Israel in 1988. The Palestine Islamic Jihad (PIJ) has been formed by militant Palestinians in Gaza during the 1970s. Therefore, it is reasonable to assume that the theoretical approach of the tournaments does not apply to this scenario. First, Hamas, PIJ or Hezbollah do not need to be involved in any tournament. They are already the 'best teams'. In particular, it is widely known that these organizations have been continuously funded by different sources. Iraqi scenario is also puzzled. First, the main problem about Iraq is represented by available data. In many cases, no group claimed responsibility of attacks. Therefore, it is difficult to select the cases which could fit the model because the database does not report the necessary definitions. For example, many events could be alternatively attributed to both Sunni or Shia groups. Secondly, in Iraq, Al Qaeda operations have been led by Al Zarqawi. However, Al Zarqawi has been officially recruited by Al Qaeda in 2002. Even in this case, it seems that a jihadist tournament as a recruitment process did not take place. However, even the role and the tasks of Al Zarqawi in Iraq are debated and controversial[12]. Third, moreover, in Iraq, resistance to U.S. occupation forces and terrorism should be disentangled. There is evidence that many attacks depend upon the presence of U.S. occupation forces (Blank et al., 2008). Table 2 reports the countries included in the sample. Moreover, table 2 reports the groups which are active in those countries. The main source has been the GTD, which reports the groups that claimed responsibility for attacks. However, since for many attacks no group claimed responsibility (or more groups claimed competing responsibility), the list has been

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[11] The Manchester Manual is available at http://www.usdoj.gov/ag/manualpart1 1.pdf (last access august 2009).
[12] The most comprehensive study on Al Zarqawi is Napoleoni (2005).

enriched including information about active groups available in Rabasa et al. (2006), and in the list of foreign terrorist organizations provided by US Department of State.

TABLE 2 – COUNTRIES, ACTIVE GROUPS

Country	Groups*,**,***
Algeria	Salafist Group for Call and Combat (GSPC)*,**,***, Armed Islamic Group (GIA)*,**,***, Essedik Katibat*, Dhamat Houmet Daawa Salafia***, AQLIM*
Bangladesh	Tablig Jamaat*, Islami Chhatra Shibir*, Jagrata Muslim Janata Bangladesh (JMJB)*, Jama'atul Mujahideen Bangladesh (JMB)*
Egypt	Tawhid Islamic Brigades*; Jamaah al-Islamiya organization (JI)*; the Battalions of the Martyr Abdullah Azzam*, Sinai Martyr's Group*, Al-Tawhid Wal-Jihad (Unity and Jihad Group in Egypt)*, Al-Jihad ***
Ethiopia	Al-Itihaad al-Islami (AIAI)**, Mujahideen Youth Movement (MYM)*
India	Hizbul-Mujahedin*, Jaish-e-Mohammed (JEM)*, Jammu and Kashmir Islamic Front (JKIF)* , Harakat ul Mujahidin (HUM)*, Lashkar-e-Tayyiba (LT)*, Harakat ul-Jihad-I-Islami/Bangladesh (HUJI-B)*
Indonesia	Jemaah Islamiya Organization (JI), Tanzim Qai'dat al-Jihad**, Majlis Mujahideen Indonesia (MMI)**
Iran	Jundullah (Soldiers of God)*
Jorda.	Tanzim Qa'idat al-Jihad fi Bilad al-Rafidayn (QJBR) (al-Qa'ida in Iraq)
Kenya	Al Qaeda*, Al-Shabaab*,
Kuwait	Al Qaeda*
Lebanon	Asbat al-Ansar , Jund al-Sham, Fatah al-Islam
Morocco	Salafia Jihadia*, Moroccan Islamic Combatant Group**
Nigeria	Boko Haram, Salafist Group for Call and Combat (GSPC)
Pakistan	Harakat ul Mujahidin (HUM), Lashkar i Jhangvi, Sipah-I-Sahaba/Pakistan (SSP) , Qari Zafar Group, Tehrik-i-Taliban
Philippines	Moro Liberation Front (MLF), Abu Sayyaf Group (ASG), Jemaah Islamiyah (JI), Al Khobar*

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Russian Federation	Riyad us-Saliheyn Martyrs' Brigade*, Caucasus Emirate*, Shariah Jamaat*, Mojahedin of Karbada*, Special Purpose Islamic Regiment (SPIR)***
Saudi Arabia	Gama'a al-Islamiyya (IG)***, Al-Jihad***
Somalia	Mujahideen Youth Movement (MYM)*, Al-Shabaab*, Al-Itihaad al-Islami (AIAI)**
Thailand	Jemaah Islamiyah (JI)**, Kumpulan Mujahedin Malaysia (KMM)***, Muslim separatists*
Turkey	Abu Hafs al-Masri Brigades*, Kurdistan Freedom Hawks (TAK)*, Islamic Great Eastern Raiders-Front (IBDA-C)***
United Kingdom	Abu Hafs al-Masri Brigades* , the Secret Organization of al-Qaeda* in Europe, Al-Jihad (AJ)***
Yemen	Gama'a al-Islamiyya (IG)***, Al-Jihad***, Aden-Abyan Islamic Army (AAIA)***

Sources: * GTD, ** Rabasa et al. (2006), *** US Department of State, List of foreign terrorist organizations (2007)

Therefore, we examine the main hypothesis of this work by using the following panel data model:

$$Victims = \beta_1 Pastvict + \beta_i X + \varepsilon_i$$

Given the asymmetry in terrorist activities across countries, the panel is unbalanced. The dependent variable of the empirical analysis is the number of victims computed as the sum of deaths and injured people. The dependent variable is event count, and therefore ordinary least squares estimates can be inconsistent and biased. The panel negative binomial regression is thus applied. In particular, the negative binomial regression has to be preferred because the data exhibit overdispersion. In this context, it is clear that they can be victims of different groups' attacks. The variable *Past victims* is defined as the number of victims of the previous terrorist attack in the same country. For sake of simplicity, let y_{it} be the number of victims in country i at time t, where the latter is an exact date. Eventually past victims is therefore defined as y_{it-1}. However there is no common time lag. Clearly, the time lag between t and $t-1$ can vary.

In order to capture the opportunity cost argument, data on GDP per capita have been extracted from the Penn World Tables[13]. CPI denotes the average annual change in consumer price index and it is extracted from IMF/WEO. The CPI proxies changes in purchasing power of individuals which can affect the standard of living. Both GDP per capita and Cpi are lagged one year. The institutional regime has been captured through the polity index as developed in Polity IV project. The actual polity-index is based on a subtraction of a value on the autocracy scale from a value on the democracy scale. Thus it results in values ranging from –10 (very autocratic) to +10 (very democratic). The Education and the Gini index of income inequality have been drawn form UNDP.

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[13]The Penn World Tables are available at http://pwt.econ.upenn.edu/php_site/pwt_index.php . Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.3, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, August 2009.

Moreover, we included a dummy variable denoting whether an attack has been launched by suicide bombers or not. It takes the value of unity in the case of suicide bombing and zero otherwise.

TABLE 3- VARIABLES, DESCRIPTIVE STATISTICS AND SOURCES

	Description	Source	Obs.	Mean	Std. Dev.	Min	Max
Victims	Number of Victims of current incidents	GTD	589	3.6	9.46	0	101
PastVict	Number of Victims of previous incident in the same country	GTD	589	3.85	11.73	0	187
Gdppc	GDP per capita (logged),	Penn World Tables	589	8.31	0.73	6.14	10.61
Polity	Polity IV project index, bounded between -10 and 10.	Polity IV Project	589	3.85	5.43	-10	10
Education	Education index	UNDP	589	0.69	0.17	0.28	0.99
CPI	average annual change in consumer price	IMF/WEO	589	6.24	5.23	-1.02	68.49
Suicide	Dummy variable (yes=1)	GTD	589	0.09	0.28	0	1
Gini Index	Gini index of income inequality	UNDP	589	37.61	4.57	30	44.5

Table 4 reports the results of the regressions. For sake of clarity both random and fixed effects estimations are presented. First, the main hypothesis of this work is confirmed. The number of victims of terrorist incidents is significantly and positively associated with the number of victims of the previous incident in the same country. In particular, it seems that the number of victims is increasing in the number of victims of the previous incident. Results appear to be robust even because the coefficients do not change across specifications. However, the magnitude of increase appears to be small. In short, it could also be maintained that it seems that the degree of violence of attacks almost equals the degree of violence of previous attacks. However, this would be perfectly in line with contest theory. Second, a negative significant association between socio-economic environment and terrorist activity also emerges. In all regressions the association between lagged GDP per capita and the number of victims is significantly negative. Such negative association appears to be even stronger when the fixed effect estimator is used. When considering also the quadratic form of lagged GDP per capita, the association turns out to be positive. This suggests a non-linear relationship between terrorist brutality and socio-economic environment.

	RE	RE	RE	FE	FE	FE
	1	2	3	4	5	6
Pastvict	.011***	.014****	.014***	.01*	.011***	.011***
	(.04)	(.004)	(.004)	(.005)	(.004)	(.004)
	[.01]	[.00]	[.00]	[.09]	[.01]	[.01]
GDP per capita(t-1)	-4.40***	-3.66****	-3.31***	-5.49***	-4.89***	-4.91***
	(1.20)	(1.16)	(1.20)	(1.50)	(1.54)	(1.60)
	[.00]	[.00]	[.01]	[.00]	[.01]	[.00]
GDP per capita(t-1) square	.27***	.21***	.19***	.32***	.28***	.29***
	(.07)	(.071)	(.075)	(.093)	(.096)	(.100)
	[.00]	[.00]	[.01]	[.00]	[.00]	[.00]
polity	.00		-.001	.01		.01
	(.014)		(.014)	(.015)		(.016)
	[.95]		[.95]	[.67]		[.74]
Education	-.67	-.23	.57	-.71	-.28	-.43
	(.71)	(.622)	(.975)	(.770)	(.709)	(1.17)
	[.35]	[.71]	[.56]	[.35]	[.69]	[.71]
Gini			-.03			.000
			(.027)			(.035)
			[.27]			[.99]
CPI			-.02			-.01
			(.018)			(.021)
			[.34]			[.60]
suicide		1.25***	1.27***		1.15***	1.15***
		(.151)	(.150)		(.162)	(.162)
		[.00]	[.00]		[.00]	[.00]
const	17.56	14.43	13.95	22.42	19.91	19.95
	(4.94)	(4.76)	(4.88)	(6.21)	(6.31)	(6.68)
	[.00]	[.00]	[.00]	[.00]	[.00]	[.00]
Obs	588	588	588	581	581	581
Groups	23	23	23	18	18	18
Log Likelihood	-1196.26	-1171.17	-1170.24	-1079.27	-1060.28	-1060.06

Notes: *** significant at 1%, ** significant al 5%, *significant at 10%. For sake of readability statistically significant coefficients are in bold. Standard Errors in parenthesis. P-values in square brackets

However, the idea that a root of terrorist activity depends also upon grievance for poverty and socio-economic seems to be confirmed at least for low-income countries. Finally, the opportunity cost argument has to be confirmed even if in the presence of a non-linear relationship between GDP per capita and terror. By contrast, there is no significant association between education and the dependent variable. The coefficient is insignificant in both fixed and random effects. That is, there is no way to defend the 'productivity argument'.

Analysing the other covariates leads also to interesting results. Surprisingly, there is no significant association between the brutality of terrorist attacks and the institutional regime. In all specifications the variable polity capturing the institutional regime is never statistically significant. This is not in line with prevailing literature which stressed the negative association between terrorism, civil liberties and democracy

(see Li, 2005, and Drakos and Gofas 2006). Perhaps, it does look less surprising when considering that the dependent variable is not the incidence of terrorist activities but the number of victims. That is, perhaps it is the choice of becoming a terrorist which can be associated with the lack of civil liberties or democratic representation. Inequality in income distribution also comes out to be insignificant. The CPI also does not show any significant association. Eventually, brutality of incidents increases in the suicide attacks. Put differently, in the presence of a suicide attack the number of victims is likely to be higher.

Further Estimations
In order to test the robustness of the previous estimation, henceforth we present some further estimations which include all the variables used in the main estimation. In particular, the regressions have been ran for different samples. Table 5 reports the results. In columns 1 and 2 we considered a sample which relaxed most 'filters' used in the main specification. In particular, for regressions 1 and 2 the 'bombing' has been removed as well as the additional criteria denoted above by small letters (a-h). In columns 3 and 4, the previous sample has been applied by applying the 'bombing' criterium. That is, each incident had to involve explosive devices. Results for regressions (1-4) confirm the main hypothesis of this work. In columns 5 and 6 the sample has been reduced in order to consider only the incidents where international targets have been reported. Even in this case the 'bombing' criterion has been relaxed. Results confirm and (reinforce) the main hypothesis. The number of victims of current terrorist incidents (with an international target) is positively and significantly associated with the number of victims of previous incident in the same country. Columns 7 and 8 report results when the sample includes only incidents where a terrorist group claimed responsibility. Columns 9 and 10 filters the previous sample by excluding the incidents which did not involve any explosive device. Results for regressions (7-10). are largely insignificant. Surprisingly, in these regressions (1-10) there is no evidence of socio-economic preconditions for terrorist brutality. That is, GDP per capita is never significant. Contrariwise, the polity score appears to be significant in three out of then regressions. Even more interestingly, the inflation rate appears to be negatively related with terrorist brutality in five out of ten regressions. Such relationship would deserve further deepening. However, even in this regressions there is no evidence to support the 'productivity argument' because the education index is always insignificant.

Table 5 – Dependent Variable: Victims by Event   (Panel Negative Binomial Regression)

	Whole sample		Bombing/explosive		International Target		Claimed		Claimed (bombing)	
	RE	FE	RE	FE	RE	FE	RE	FE	RE	FE
	1	2	3	4	5	6	7	8	9	10
Pastvict	0.00***	0.00***	.01***	.01***	.02***	.02***	.00	.00	.00**	.00
	(.001)	(.001)	(.002)	(.002)	(.004)	(.006)	(.001)	(.002)	(.002)	(.003)
	[0.00]	[0.01]	[.00]	[.00]	[0.00]	[0.00]	[.24]	[.33]	[.07]	[.25]
GDP per capita(t-1)	.91	0.83	-1.09	-1.25	-1.49	-2.30	1.05	101	1.42	2.93
	(.550)	(.591)	(.759)	(.855)	(1.38)	(2.11)	(1.07)	(1.21)	(1.63)	(2.03)
	[.10]	[0.16]	[.15]	[.15]	[0.28]	[0.28]	[.33]	[.40]	[.39]	[.15]
GDP per capita(t-1) square	-.06	-.05	.06	.07	.08	.12	-.06	-.06	-.09	-.20
	(.036)	(.04)	(.05)	(.055)	(.083)	(.126)	(.067)	(.076)	(.10)	(.129)
	[.10]	[0.20]	[.21]	[.18]	[.31]	[.32]	[.34]	[.48]	[.39]	[.12]
polity	-.02***	-.02***	-.00	.00	-.03	-.07**	-.02	-.02	.02	.00
	(.005)	(.005)	(.009)	(.009)	(.02)	(.034)	(.011)	(.013)	(.018)	(.022)
	[0.00]	[0.00]	[.91]	[.98]	[.26]	[.04]	[.13]	[.11]	[.40]	[.99]
Education	-.14	-.37	.37	.14	-1.40	-1.72	.48	.47	1.10	3.41
	(.45)	(.49)	(.64)	(.722)	(1.09)	(2.04)	(.914)	(1.09)	(1.21)	(1.99)
	[.76]	[.45]	[.57]	[.85]	[.20]	[.40]	[.60]	[.66]	[.36]	[.10]
Gini	.06***	.06***	-.02	-.01	.04	.09**	.02	.02	.00	-.05
	(.011)	(.012)	(.02)	(.02)	(.035)	(.043)	(.025)	(.028)	(.041)	(.059)
	[.00]	[.00]	[.32]	[.58]	[.31]	[.05]	[.45]	[.42]	[.98]	[.39]
CPI	-.05***	-.05***	-.02	-.02**	-.02	-.02	-.06	-.07	-.01	-.03
	(.006)	(.006)	(.01)	(.01)	(.022)	(.29)	(.015)	(.016)	(.019)	(.022)
	[.00]	[.00]	[.09]	[.05]	[.49]	[.49]	[.00]	[.00]	[.76]	[.26]
suicide	1.32***	1.33***	-.00	-.00	1.82***	1.95***	.23	.27	1.67***	1.74***
	(.071)	(.072)	(.129)	(.121)	(.245)	(.266)	(.158)	(.159)	(1.159)	(.163)
	[.00]	[.00]	[.98]	[.97]	[.00]	[.00]	[.14]	[.09]	[.00]	[.00]
const	-6.18***	-6.14***	3.94	4.31	4.48	6.72	-5.80	-5.93	-7.71	-12.25
	(2.25)	(2.40)	(3.15)	(3.52)	(5.81)	(9.12)	(4.49)	(4.99)	(6.87)	(8.38)
	[0.01]	[0.01]	[.21]	[.22]	[.44]	[.46]	[.20]	[.23]	[.26]	[.14]
Obs	3830	3830	1836	1833	197	192	666	663	323	321
Groups	25	25	25	23	24	19	23	20	21	19
Log Likelihood	-7783.8312	-7621.41	-3455.95	-3314.97	-368.73	-269.09	-1604.57	-1473.77	-733.59	-616.98

Notes: *** significant at 1%, ** significant al 5%. For sake of readability statistically significant coefficients are in bold.

Summary and conclusion

The empirical results confirm the main hypothesis of this work, namely that the number of victims of a terrorist attack is significantly and positively associated with the number of victims of past attacks. This seems to confirm that would-be terrorist groups behave as they were in a tournament. In short, they observe the results of past attacks and maximize their efforts in order to make attacks at least equally destructive as the foregoing attacks. This empirical result is new and sheds new light upon the 'production' of terror. Moreover, what we would also claim is that the empirical analysis is based upon a selection of attacks which fit the Al Qaeda style and approach. This makes the analysis peculiar. That is, it cannot be compared with foregoing studies which did not disentangle behaviour of would-be Al Qaeda cells from the complex and heterogeneous universe of terrorism.

The policy implications descending from the findings of this study are somehow puzzled. A general improvement of standard of living appears to have the potential to reduce the likelihood (and even the brutality) of terrorist attacks. In fact, results show a negative association between number of victims and GDP per capita alternatively. Secondly, an additional prescription is related to funding. Needless to say, since reward to would-be terrorist groups is expected to be monetary, therefore, tracking financial

flows of terrorist organization becomes a critical task. The argument for an international cooperation on regulating financial flows is thus strengthened.

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