



How Foreign Aid Affects Terrorism: Studying the Channel of Social Spending

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The United States has always used foreign aid to achieve strategic goals (Moss, Roodman, and Standley 2005). From the Marshall Plan of the Cold War era to the exorbitant aid packages given to Egypt and Israel as part of the Camp David Accords, American officials have long used foreign aid to win political allies and to promote regional security, furthering U.S. interests. Ever since the attacks of September 11, U.S. foreign aid has been shaped profoundly by what President George W. Bush termed the “war on terror.” In a speech given in Monterrey on March 22, 2002, President Bush explained the rationale behind the foreign aid component of the “war on terror”: “We fight against poverty because hope is an answer to terror,” he said (cited in Krueger and Maleckova 2003). Implicit in the statement is the belief that poor economic conditions allow for the rise of, or even provoke, terrorist activity, and that giving aid for the purpose of reducing poverty in foreign countries is one way of effectively fighting against terrorism.

According to the Office of Management and Budget’s 2004 overview of international assistance programs, the United States “will provide extensive assistance to states on the front lines of the anti-terror struggle, both in terms of financial assistance and training and support for allied governments.” The document singles out the frontlines of Afghanistan, Colombia, Jordan, Pakistan, and Turkey as crucial in the war on terror.

The data confirm that the United States has put its money where its mouth is. Moss, Roodman, and Standley (2005) look at changes in country allocation by USAID over 1998-2001 versus 2002-05 and conclude that U.S. foreign aid to the critical countries of Iraq, Afghanistan, Jordan, and the Palestinian Territories has increased significantly. The authors fail to find a significant correlation between USAID and any of their Global War on Terror (GWOT) proxies, though this may be due to problems in the specification. One of the key proxies, “relative share of Muslim population,” is a poor measure of the likelihood that a country will produce terrorists. India, for example, contains only a small fraction of the world’s Muslim population (the country is overwhelmingly Hindu), yet it has experienced more terrorist attacks than any other country in modern history. Indonesia, on the other hand, is the most populous Muslim country in the world, yet it has experienced only a tiny fraction of the terrorism seen in India (Juergesmeyer 2008). If it is assumed that the United States is only concerned about protecting its own interests, however, India may be seen as less strategic in the war on terror as compared to countries like Afghanistan or the Palestinian Territories, which house terrorists with the primary aim of harming the United States and Israel, a strong ally of the United States, respectively. Regardless of these technicalities, Moss, Roodman, and Standley (2005) convincingly show that the United States has dramatically increased foreign aid to a handful of countries which play an important role in the war on terror.

In recent decades transnational terrorism has mainly involved attacks on rich and democratic countries perpetrated by nationals from developing countries (Krueger and Laitin 2003). In light of this pattern, several developed countries, including the United States, have increased aid to the developing countries from which terrorists commonly often originate. Economic literature has identified two possible mechanisms by which donor countries use

foreign aid to reduce the number of terrorist attacks supplied by (i.e., perpetrated by nationals of) the recipient country: (1) by alleviating poverty in the recipient country and (2) by providing an incentive and the necessary resources for the recipient government to adopt a behavior more in line with the donor's concerns, i.e., to fight terrorism domestically (Azam and Delacroix 2006).

President Bush's speech in March of 2002 articulates the conventional wisdom that terrorism breeds in poverty-stricken environments, and that those who are most likely to engage in terrorist activity are poor, uneducated individuals with a bleak outlook on life. Basic economic theory on individual rationality asserts that an individual would be more likely to engage in risky terrorist activity if doing so bears a lower opportunity cost—that is, if there exist fewer economic opportunities to forgo by perpetrating acts of terrorism. However, after analyzing a survey of tens of thousands of Muslims from different parts of the world, Esposito (2007) concludes that Muslims with “radical” views on the permissibility of violence tend to be more optimistic about the future than “moderates.” It cannot be assumed, then, that individuals that condone violent behavior tend to have a bleaker outlook on life—at least in the Muslim World. Furthermore, several studies have shown that terrorists often come from wealthy backgrounds.

Both Krueger and Maleckova (2003) and Krueger and Laitin (2003) argue that terrorists from different movements, including Hezbollah (a Shiite terrorist group formed to oppose Israeli incursions into southern Lebanon), are predominantly recruited from a relatively wealthy and educated family background. Krueger and Maleckova (2003) look at public opinion polls conducted in the West Bank and Gaza Strip concerning support for attacks against Israeli targets. They argue that the polls indicate that support for violent attacks does not decrease among those with higher education and higher living standards. Moreover, they show that having a living standard above the poverty line or a secondary school or higher education is positively associated with participation in Hezbollah. Similarly, they show that a majority of Israeli Jewish settlers who attacked Palestinians in the West Bank in the early 1980s were from high-paying occupations.

Pape (2005) compiles and analyzes the most comprehensive database on suicide terrorism yet conceived. In his study he looks at data on 315 suicide terrorism campaigns around the world from 1980 through 2003, as well as 462 individual suicide terrorists. He concludes that the “economic explanation” for terrorism—i.e., the poverty argument mentioned above—yields “poor” results and therefore is probably unfounded. While it is possible that there is something distinct about the motivations of suicide terrorists which influences how they view economic considerations, the study is nonetheless intriguing because it explores the determinants of an increasingly popular form of terrorism and because its results seem compatible with the micro-level studies mentioned above.

At first glance, these results seem to contradict rational theory, presenting a puzzle for economists. As Azam and Delacroix (2006) put it, “Higher wealth and education increase the opportunity cost of taking risk in perpetrating a terrorist attack, and still do not seem to act as a deterrent in the real world, at least for those who cross the line.” Yet many, notably Pape (2005), have refused to write off terrorism as inherently irrational, stressing instead its rational, strategic logic. Economists have devised three arguments to reconcile rational theory with these surprising findings: (1) assumption of rationing on the volunteers' market (Bueno de Mesquita 2005); (2) motivation by altruism toward the next generation (Azam 2005); and (3) the social pressure

dimension of the decision to engage in suicide bombing (Berman and Laitin 2005, Wintrobe 2006, and Ferrero 2006). The first argument, which will be discussed shortly, challenges the claim that higher income does not deter terrorism. The latter two arguments present reasons why terrorists may act rationally even if they are not deterred by the opportunity cost created by increasing wealth and education.

Bueno de Mesquita (2005) argues that economic considerations may still influence the decision to join a terrorist group, despite the observation that members of terrorist groups tend to be wealthier and more educated than their non-terrorist peers. He notes that many terrorist groups, such as Hezbollah, implement a “screening test” for prospective members which ensures that only the most qualified applicants are admitted into the group. Because wealth and education both positively contribute to an individual’s ability to successfully carry out a terrorist attack, he argues, those admitted into the group are typically from wealthier, relatively more educated backgrounds than the surrounding population. Consequently, we cannot make conclusions about who is willing to become a terrorist only by looking at those individuals who actually become terrorists. Economic prosperity, then, may *generally* still act as a deterrent against joining terrorist organizations. However, Bueno de Mesquita admits that, according to this model, rising income may have an opposite effect: If a terrorist group’s resources increase as national economic prosperity increases, then the terrorists may be able to competitively bid for high-quality recruits. Furthermore, if the terrorist organization is able to increase its budget in this way, it may be in an even better position, as the pool of qualified operatives expands.

Azam and Thelen (2008) note that, although terrorists tend to be relatively wealthier than the surrounding population, several empirical papers have shown that economic downturns are significant for explaining upsurges of terrorist attacks (Blomberg et al. 2004; Li 2005). This finding seems to confirm the conventional wisdom that terrorism breeds in poor economic conditions. Once again, however, the macroeconomic evidence seems to contradict the findings from individual-level surveys. From both a theoretical and an empirical standpoint, there remains much disagreement over the effect of economic incentives on terrorism.

Azam and Delacroix (2006) suggest that the above analyses suffer from an omitted-variable bias, as Official Development Assistance (ODA) is significant in their structural equation, controlling for a country’s GDP per capita. Hence, even if foreign aid is ineffective in raising the recipient’s national income or its level of education, they argue, it could have an impact by some other channels. Before that paper was published, the literature focused primarily on foreign aid’s impact on terrorism via poverty alleviation, the first mechanism mentioned above. Whether foreign aid tends to be successful in reducing poverty in the recipient country is a question that has been thoroughly explored in the literature and which is beyond the scope of this paper.

The second mechanism through which foreign aid is presumed to influence terrorism is the incentive it provides the recipient government to adopt a behavior more in line with the donor’s concerns, i.e., to fight terrorist groups domestically. Alesina and Dollar (2000) show that colonial history and strategic alliances (and not poverty alleviation) are generally the main determinants of the amount of aid received by a country. Moss, Roodman, and Standley (2005) show that since 9/11 U.S. foreign aid has been concentrated more heavily on a handful of countries that the United States deems strategic in the war on terror. How foreign aid affects

terrorism, and through what channels it achieves this effect, then, are two empirical questions of great importance.

Azam and Delacroix (2006) construct a principal-agent model of foreign aid in which the recipient government is an agent who is supposed to perform some tasks on behalf of the principal, the donor. It predicts that increasing foreign aid to a country will cause terrorism to decrease in that country, due to the incentive it gives the recipient government to fight terrorism domestically. Foreign aid creates this incentive by offsetting the costs the recipient government incurs by fighting terrorism. Additionally, the donor may earmark parts of the aid for certain projects it deems necessary in the fight against terrorism. Using a sample of 178 countries, the authors find that the amount of aid received is significantly positively correlated with the number of terrorist attacks originating in a given country, in a parsimonious cross-country equation which controls only for the recipient country's GDP per capita and population size. They argue that the relation between aid and the supply of terrorist attacks is positive because (i) aid has a beneficial influence on the supply of terrorist attacks, and, therefore (ii) donor countries are giving more aid to governments of countries where more dangerous people come from. The parsimonious cross-country equation, they argue, is picking up the effects of endogeneity: both the dependent variable (supply of terrorism) and the key independent variable (foreign aid received) are highly correlated with the degree of militancy in the country. The authors assume that both the donor and the recipient government benefit from an intimate knowledge of the militancy present in the recipient countries, which is not available to the researcher. Using a few proxies for "militancy" as controls—including dummy variables for the West Bank and Gaza, "Camp David" countries (Egypt and Israel), sub-Saharan countries, and pre-1990 OECD members, among others—they show that the amount of Official Development Assistance (ODA) received actually has a negative impact on a country's supply of attacks (i.e., the number of transnational attacks by nationals of that country). They conclude that aid is probably useful for fighting terrorism, and is to some extent delivered for that purpose. They speculate that it is not the effectiveness of aid at reducing poverty that is at stake, but its role as an incentive for recipient governments to act more decisively against terrorism. However, they do not test this assertion in their paper.

Azam and Thelen (2008) expand upon the work of Azam and Delacroix (2006), presenting stronger estimates of the role of aid while additionally looking at the impact of secondary school enrollment on the number of terrorist attacks supplied by a country. As in Azam and Delacroix (2006), the authors conclude that the level of foreign aid received by a country reduces its supply of terrorist attacks. They also find that the recipient country's level of education (as measured by enrollment in secondary school as a gross percentage of the secondary school-age population) has a negative impact on the supply of terrorism, independent of the effect of ODA. The authors address another endogeneity problem similar to the one presented in Azam and Delacroix (2006). Both Krueger and Maleckova (2003) and Krueger and Laitin (2003) show that terrorists tend to originate from repressive states in a cross-country regression estimated over the period 1997-2002. This seems to suggest that a repressive government structure is one factor which causes individuals to become terrorists. However, Azam and Thelen (2008) argue that there probably exist highly militant groups in the countries from which many terrorists originate, which may in turn cause their governments to adopt repressive measures. What remains unclear is the ultimate cause in the relationship: does militancy breed in repressive

environments, or are governments forced to adopt more repressive measures in response to the high degree of pre-existing militancy within their countries?

What is clear from this debate is that any empirical analysis of the determinants of terrorism needs to somehow account for the effect of preexisting militancy in a country. For the sake of clarity, “preexisting militancy” will refer to (1) the degree to which violent approaches to achieving strategic ends are historically long-standing in a region and (2) how deeply seated public attitudes which bolster and legitimate these actions are.

Both Azam and Delacroix (2006) and Azam and Thelen (2008) identify two strategies which a government may be induced to pursue upon receiving foreign aid. Frey (2004) examines both of these approaches to counterterrorism, the “carrot” and the “stick,” in detail. He identifies three “positive” (“carrot”) approaches to fighting terrorism at home. The first positive approach is reducing social support for terrorists by increasing social spending. A populace that is better off financially, he argues, is less likely to support extreme measures such as terrorism. The second positive approach is ensuring that the local media does not give terrorists the attention they crave by immediately giving them “credit” for attacks, particularly before it is clear which group(s) executed the attack. Sageman (2008) echoes support for this policy approach. The third positive approach is decentralizing economic, political, and social centers of decision-making. This greatly reduces the incentives for potential terrorists to attack, Frey argues, because “polycentricity” lowers the potential damage a terrorist could inflict with a single attack and enables the various parts of society to compensate quickly for any damage done. Enders and Sandler (2008) place this approach under the umbrella of “defensive” counterterrorism, which also includes increasing security measures to lower the terrorists’ probability of success. Together, these three positive approaches turn the interaction among terrorists and all other members of society into a positive sum interaction in which all parties benefit. Frey argues that the chances of finding a peaceful solution are therefore greatly improved.

Frey defines “coercive” deterrence (the “stick”) as repressive military and police action taken against terrorist organizations. He concludes that positive approaches have proven to be effective in reducing incentives for terrorism. On the other hand, he argues, “Coercive deterrence has been ineffective. It has high human, material, legal and moral costs, and may even lead to counterproductive results.” Despite this ineffectiveness, he claims, governments overwhelmingly choose the coercive route in fighting domestic terrorism, because they have strong incentives to do so: politicians reap private gain from the “quick results” such action produces, while the public receives no such benefit, since coercive deterrence only increases terrorist activity in the long run.

Frey’s second and third “positive” prescriptions make intuitive sense and enjoy support from many authors in the field of terrorism (see, for example, Sageman [2008] and Esposito [2003]), yet they are largely impractical and will not likely be adopted. If there is evidence that a terrorist group is responsible for an attack, the media will report it as such. Furthermore, it is completely unfeasible to restructure an entire city to achieve “polycentricity” so that it no longer contains any centers of political, economic, or social decision-making. Therefore, any analyses of the “positive” approach to counterterrorism are best served looking at the effect of Frey’s first positive approach: social spending.

So far the literature on foreign aid and terrorism has succeeded in drawing a fairly strong direct link between foreign aid and terrorism. However, economists have yet to convincingly identify the exact channels through which foreign aid reduces terrorism. Both Azam and Delacroix (2006) and Azam and Thelen (2008) show that foreign aid has a statistically significant negative impact on terrorism after controlling for militancy. They assume that recipient governments achieve this negative impact by using a mixture of positive and coercive forms of deterrence. Azam and Delacroix admit that their assumption that the government uses both the “carrot” and the “stick” to differing degrees depending on local conditions is nothing more than a guess. This is troubling because Frey (2004) argues that governments overwhelmingly choose to engage in coercive deterrence rather than positive deterrence, and that coercive deterrence has been clearly ineffective and even counterproductive. Azam and Delacroix (2006) note that the actual link between aid and reduced terrorism is “neglected” in the analytical literature.

Azam and Thelen (2008) convincingly argue that ODA and education (measured as gross enrollment in secondary and tertiary school) have a significant negative effect on the supply of terrorist attacks supplied by a country. They argue that the model and the empirical results suggest that the donors can usefully earmark some of that aid for supporting the education sector, but they do not directly test the relationship between ODA and education. It therefore remains unclear to what extent (if any) foreign aid is used as a tool for inducing recipient governments to increase education expenditures with the intent of decreasing the supply of terrorism. It also has yet to be shown whether donors use foreign aid to induce the recipient government to increase other types of social spending, such as public health expenditures, with the goal of reducing the supply of terrorist attacks. Specifically, the literature on terrorism and foreign aid has thus far failed to show how countries change their social spending policies in response to changes in the inflow of foreign aid. Furthermore, it is worthwhile to reexamine the effects different forms of social spending have on terrorism, viewing social spending as one possible channel through which foreign aid can affect a country’s supply of terrorist attacks.

I. Theoretical Argument

The question of whether foreign aid has been relatively successful at increasing a recipient country’s GDP is beyond the scope of this paper. Examining the effect of foreign aid on terrorism through the channel of military expenditures is equally challenging; there exist obvious endogeneity problems with testing the effect of military expenditure on terrorism, and it is difficult to imagine a variable that is both correlated with military expenditure and uncorrelated with terrorism or any political process (after all, terrorism is often a politically motivated act and is likely to be correlated with election cycles). Constructing a good instrumental variable for military expenditures therefore presents a challenge which this paper does not attempt to overcome. Instead, this paper will focus on (1) to what extent changes in foreign aid cause changes in public expenditures on education and health (here viewed as proxies for “social spending”), and (2) to what extent general education and health levels in a country influence the country’s supply of terrorist attacks.

Based on the results presented in the existing literature, this paper predicts that there is a positive correlation between the change in foreign aid received by a country and the change in public health and education expenditures in that country. In other words, it predicts that an

increase in foreign aid received will be associated with an increase in social spending by the recipient government. This is explained by both the overall increase in the government's budget and the strategic nature of foreign aid—as Azam and Thelen (2008) argue, donor governments will likely earmark aid for certain projects which it sees as necessary for achieving its strategic goals. In the context of the war on terror, it is presumed that donor governments will to some extent earmark aid for social spending in order to reduce terrorism through a “positive” approach.

The paper's second prediction is that a rise in levels of health and education—two areas which are directly affected by the social spending examined in (1)—is associated with a decrease in a country's supply of terrorism, as Frey (2004) and others have argued. Education, apart from the positive impact it has on an individual's life prospects which may also be associated with a high GDP per capita, assumedly increases an individual's awareness of and ability to identify with the perspective of others. Additionally, education better equips individuals with the means of pursuing strategic goals in peaceful, diplomatic ways and, due to the increased life prospects it brings, increases the opportunity cost of engaging in terrorism. Micro-level surveys as well as the biographies of many high-profile terrorists seem to contradict this intuition—al-Qaeda leader Osama bin Laden holds a degree in economics and business administration, and his right-hand man, Ayman al-Zawahiri, is a doctor—so it is worthwhile to test on a macro level whether populations with a higher level of education tend to produce fewer terrorists.

Azam and Thelen (2008) present another theoretical quandary concerning the relationship between education and terrorism, noting that “people with a lower rate of time preference will invest more resources in education, and will also be more willing to sacrifice their own lives for the sake of the future generation. Hence, the effect of education on the opportunity cost of putting one's life at risk might be offset by its positive impact on inter-generational altruism.” Testing the net effect of education on terrorism is an important pursuit, as the result would carry strong implications for the policy of earmarking foreign aid sent to strategic GWOT countries for education. The causal connection between health levels and terrorism is less obvious; this paper will use health indicators as another way in which social spending may generally impact the supply of terrorism by a country.

II. Empirical Analysis

This paper draws on two sources of transnational and international terrorism data. There is a clear advantage to using transnational and international terrorism data as opposed to domestic terrorism data when studying the effect of foreign aid on terrorism. Enders and Sandler (2006) describe an important asymmetry in which most international terrorist attacks are committed by individuals from the developing world and most targets of transnational terrorism are developed countries. This means that the world's developed countries, which supply the vast majority of the world's foreign aid, would only be concerned with transnational terrorism, which may affect their own populations. It therefore would not make sense to study domestic terrorism data, as foreign donors are far less likely to care about domestic attacks in other countries as they would attacks in their own countries perpetrated by nationals of another country.

The first data source used in this paper is the International Policy Institute for Counter-Terrorism (ICT) database. The total number of terrorist attacks supplied by (i.e., committed by a

national of) each country was aggregated over the period 1990-2004. ICT defines terrorism as “the deliberate use of violence aimed against civilians in order to achieve political ends,” documenting a total of 1,480 terrorist attacks over this time period. Each event is transnational in that the target and the source countries are different. Table 5 in the appendix lists the number of attacks supplied by each country during that period as recorded by ICT. The sample includes 175 countries, as some countries were dropped because they lacked data on the explanatory variables. In the sample, 120 countries supplied zero attacks, and the West Bank and Gaza Strip supplied the most attacks, with 400 incidents over the period. However, terrorist incidents were not concentrated in solely one region, as sub-Saharan Africa, Asia, Europe, and Latin America all have source countries in the top 10.

For the sake of comparison, this paper also draws on data from the International Terrorism: Attributes of Terrorist Events (ITERATE) database over the same time period. Like the ICT database, ITERATE records only transnational terrorist attacks, meaning the source country is different from the target country. ITERATE defines international/transnational terrorism as:

The use, or threat of use, of anxiety-inducing, extra-normal violence for political purposes by any individual or group, whether acting for or in opposition to established governmental authority, when such action is intended to influence the attitudes and behavior of a target group wider than the immediate victims and when, through the nationality or foreign ties of its perpetrators, its location, the nature of its institutional or human victims, or the mechanics of its resolution, its ramifications transcend national boundaries.

ITERATE’s slightly different definition of terrorism provides a robustness check on the results presented in this paper.

Whereas the ICT database provides clearly defined data on the number of terrorist attacks originating from each country, ITERATE provides slightly more nuanced information. The database provides the “first nationality,” “second nationality,” and “third nationality” of the terrorists who committed each attack recorded. In the sample, the vast majority of the observations on “second nationality” and “third nationality” were listed as either unknown or irrelevant, meaning those variables offer little if any explanatory power concerning a country’s supply of terrorist attacks. “First nationality” is therefore used in the sample as a proxy for the source country of a terrorist attack. Over the period 1990-2004, ITERATE records 2,806 terrorist attacks for which “first nationality” is known and 1,256 for which it is not known. Table 6 in the appendix lists the number of attacks per country over this period as recorded by ITERATE.

Since data collectors rely on open news sources for information on terrorist events, any database on terrorism is likely to suffer from a bias toward more “news-worthy” forms of terrorism. Furthermore, the data set likely underestimates the number of events in less transparent countries with restrictions on the media. Also, the definition of terrorism used by data collectors is likely to impact the data set significantly. Even with these considerations in mind, however, it is surprising how dramatically the ITERATE and ICT data sets diverge concerning the distribution of terrorist attacks by source country. The correlation between ITERATE and ICT is quite low at 0.15. This means that ITERATE and ICT may produce very different results

in the regressions, so it is worthwhile to test both. The vast majority of papers dealing with terrorism use only one source of terrorism data. The reason why ITERATE and ICT diverge so greatly—besides, of course, the element of human error in the data collection process—may be that they use slightly different definitions of transnational and international terrorism.

The rest of the data come from the World Bank World Development Indicators (WDI) database. This paper uses two different measures of foreign aid in the first part of the empirical section for the sake of robustness. The first is Official Development Assistance (ODA), typically considered the standard measure of foreign aid. This variable aggregates the disbursements of loans and grants by official agencies of the members of the Development Assistance Committee (DAC) to promote economic development and welfare in the recipient countries. The second measure of foreign aid is Net DAC donor flow from the United States. Net DAC donor flows are the net disbursements of ODA or official aid from the members of the Development Assistance Committee (DAC). This paper uses only the Net DAC donor flow from the United States because the United States has been the leader of the war on terror and therefore may use its foreign aid more strategically in fighting terrorism.

This paper also uses WDI's measure of public spending on education and health as a percent of GDP. For more long-term indicators of education, this paper uses gross enrollment in secondary and tertiary school. Gross enrollment is the ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown. For a long-term indicator of health, this paper uses WDI's measure of average life expectancy at birth. Two of the controls for militancy found in Azam and Thelen (2008) are used as well, namely dummies for the West Bank and Gaza and the "Camp David" countries (Egypt and Israel). These dummy variables control the inordinate amount of preexisting militancy in those countries—militancy which is well-known and which is likely to cause those countries to attract more strategic foreign aid. Population and GDP per capita are used as general controls.

To control for the effect of armed conflict on terrorism, this author initially consulted the dataset compiled by the Uppsala Conflict Data Program (UCDP) and the Centre for the Study of Civil Wars, International Peace Research Institute, Oslo (PRIO). In the UCDP/PRIO Armed Conflict Dataset, armed conflict is defined as "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths." The "minor conflict" dummy would take the value of one in years in which between 25 and 999 deaths resulted from armed conflict; otherwise, it is zero. The "war" dummy would take the value of one in years in which at least 1000 deaths resulted from armed conflict; otherwise, it is zero.

However, the conflict dummies were omitted for two reasons. First, there is likely to be a great deal of reverse causality in the relationship between armed conflict and terrorism. Second, the data was aggregated and averaged for each country over the period 1990-2004 (for reasons that will be discussed shortly), making it impossible to pick up the effects that armed conflict had on terrorism in a particular year.

This paper averages variables over the period 1990-2004 to correct for a selection bias in the time-series data due to a systematic lack of data on primarily developing countries. Using the averages and looking only at cross-sectional variation across countries ensures that each country

in the sample is weighted the same. A total of 175 countries are used in the sample, as data on either the dependent variable or the explanatory variables was lacking for several developing countries and island nations.

This paper uses two main regressions to answer two basic questions. The first is, how do countries change their social spending—here defined as health and education spending—habits in response to changes in foreign aid? The second is, how do levels of health and education in a country affect that country's supply of terrorist attacks?

Regression #1

To test how changes in foreign aid influence changes in public health and education expenditures, this author measured each variable as the difference between its average value over the period 2002-2005 compared to its average value over the period 1998-2001. These two periods were used to pick up changes in the distribution of foreign aid resulting from the war on terror, which the United States commenced after the 9/11 attacks. ODA and Net DAC (U.S.) are used in separate regressions to see if U.S. foreign aid tends to earmark more money for education and health programs than does foreign aid in general. Regression #1 in its two main iterations appears as follows:

$$\text{Change in education expenditure} = \beta_0 + \beta_1(\text{change in foreign aid}) + \beta_2(\text{change in GDP per capita}) + \beta_3(\text{change in total population})$$

$$\text{Change in health expenditure} = \beta_0 + \beta_1(\text{change in foreign aid}) + \beta_2(\text{change in GDP per capita}) + \beta_3(\text{change in total population})$$

Regression #1 is tested using ordinary least squares.

Regression #2

In the second regression, as mentioned before, the number of terrorist attacks per source country was aggregated over the period 1990-2004. To check robustness, separate regressions were run for ICT and ITERATE. The explanatory variables from the WDI database were averaged over the same period. Average gross enrollment in secondary school is used to capture the effect of education on the supply of terrorist attacks. Gross enrollment in tertiary school was also tested to check for robustness. Average life expectancy at birth is used to capture the effect of overall health levels on terrorism. ODA as a percentage of gross national income (GNI) is also included as an explanatory variable since aid is likely to affect terrorism through channels other than social spending, such as military expenditure. Total population and GDP per capita are also included, as are various controls for militancy mentioned above. Regression #2 in its two main iterations appears as follows:

$$\text{ Terror Supply} = \beta_0 + \beta_1(\text{school enrollment}) + \beta_2(\text{ODA } [\% \text{ GNI}]) + \beta_3(\text{population}) + \beta_4(\text{GDP per capita}) + \beta_4(\text{controls for militancy})$$

$$\text{*Terror Supply*} = \beta_0 + \beta_1(\text{life expectancy}) + \beta_2(\text{ODA } [\% \text{ GNI}]) + \beta_3(\text{population}) + \beta_4(\text{GDP per capita}) + \beta_5(\text{controls for militancy})$$

Regression #2 is tested using both the negative binomial and zero-inflated negative binomial estimators. Since Terror Supply is a count variable which only takes the value of a positive integer, ordinary least squares is inappropriate. Furthermore, Table 14 shows that both Terror Supply (ICT) and Terror Supply (ITERATE) exhibit overdispersion, meaning the variance of the number of occurrences exceeds the expected number of occurrences, which is equal to the mean when the estimator is unbiased. The standard Poisson model, which assumes that the variance of the number of occurrences equals the expected number of occurrences, is therefore inappropriate. The negative binomial model allows the mean (λ) to differ from the variance ($\lambda + \alpha\lambda^2$) and is therefore more appropriate in cases where the dependent variable exhibits overdispersion. The negative binomial model is more reliable than the standard Poisson model when the dependent variable has many zeros, but in cases in which the number of zeros is extremely high, the zero-inflated negative binomial model may be preferable. As a robustness check, both models are used.

This paper proposes to study the effect of foreign aid on terrorism through the channel of social spending, but different variables are used in each regression to capture this social component. This author chose not to test the effect of public expenditures on health and education on terrorism because of the obvious endogeneity problem which arises. Countries which produce more terrorists likely spend more money on military forces and equipment needed to fight terrorism, diverting government funds away from social programs. This endogeneity produces a spurious negative correlation between social spending and the supply of terrorist attacks. To correct for this endogeneity problem, this paper uses two long-term measures of health and education (described above) which are unlikely to be affected by a country's supply of terrorist attacks.

The connection between foreign aid and terrorism through the channel of social spending, then, is based on the assumption that public expenditures on health and education will affect long-term indicators of health and education. Certainly, the extent to which this is the case depends on the efficacy of the social programs, but the regressions tested still carry important policy implications which will be discussed in more depth in the conclusion. Briefly, the results of these two regressions will show (1) to what extent a government changes social spending habits in response to changes in foreign aid received and (2) to what extent health and education—the two social issues toward which social spending is directed in this model—affect the supply of terrorist attacks by a country.

III. Results

Empirically, this paper most closely resembles Azam and Thelen (2008), which tests the effects of ODA and school enrollment on the supply of terrorist attacks. That paper utilized a negative binomial regression and relied only on the ICT data. The present paper introduces more robustness checks, comparing the results produced by ICT and ITERATE as well as by the negative binomial and zero-inflated negative binomial models. Additionally, no paper to this author's knowledge has attempted a two-stage process which studies the link between foreign aid and social spending before testing the effect of foreign aid and social indicators on terrorism.

Regression #1

We first test the effect of a change in foreign aid on public expenditures on education. To test the first iteration of this model, ODA (% GNI) served as the primary explanatory variable. Table 7 in the appendix shows that the coefficient on ODA in this equation is insignificant. However, net DAC (U.S.) had a positive coefficient significant at the 10 percent level.

Table 1: Change in average public expenditures on education as a percentage of GDP from period 1998-2001 to period 2002-2005

Variables	Coefficient	t-Statistic	p-value
Intercept	0.373	3.50***	0.001
Change in net DAC (U.S.)	1.19E-09	1.76*	0.080
Change in GDP per capita	-0.000	-1.85*	0.067
Change in Population	-1.23E-08	-4.07***	0.000
Nb. Obs.	134		
R ²	.033		
F-Stat	7.25		
p-value	0.000		

*Note: Equation estimated by ordinary least squares with robust standard errors. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.*

The result that a change in net DAC (U.S.) is significantly positively correlated with a change in public expenditures on education while ODA (% GNI) is insignificant implies that the United States gives higher priority to earmarking foreign aid for education than the average donor does. Reverse causality is unlikely in this model, as a change in public expenditures on education is unlikely to cause a change in the amount of net DAC (U.S.) received, as the United States is more likely to disburse aid according to GDP per capita and strategic political and military interests.

Now we test the effect of a change in foreign aid on public expenditures on health. Once again, ODA (% GNI) is insignificant, as shown in Table 8 in the appendix. Net DAC (U.S.) was insignificant as well, but it was more significant than ODA.

Table 2: Change in average public expenditures on health as a percentage of GDP from period 1998-2001 to period 2002-2005

Variables	Coefficient	t-Statistic	p-value
Intercept	0.113	1.82*	0.071
Change in net DAC (U.S.)	2.87E-10	0.87	0.387
Change in GDP per capita	0.000	3.61***	0.000
Change in Population	-2.84E-09	-1.53	0.127
Nb. Obs.	173		
R ²	.035		
F-Stat	7.60		
p-value	0.000		

*Note: Equation estimated by ordinary least squares with robust standard errors. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.*

In both regressions testing the effect of a change in foreign aid on social spending in the recipient country, ODA (% GNI) was insignificant. A change in net DAC (U.S.) was significantly positively correlated with a change in education expenditures in the first regression, though its effect on the change in health expenditures was insignificant in the second regression. Overall, these two regressions provide moderately convincing evidence that recipient countries increase public education expenditures (though not health expenditures) in response to an increase in foreign aid from the United States. Furthermore, a change in the total amount of ODA received by a country does not seem to be a significant determinant of the change in either education expenditures or health expenditures over the time period tested.

Regression #2

Next we test the effect of different health and education characteristics of a country on the supply of terrorist attacks by that country. The first iteration of this regression will test the effect of secondary school enrollment (% gross) on the supply of terrorist attacks. As mentioned before, this will be measured using both ICT and ITERATE data, and both negative binomial and zero-inflated negative binomial models, resulting in a total of four regressions.

Table 3: Number of Terrorist Events Originating from Each Country (1990-2004) (ICT)

Variables	Equation 1			Equation 2		
	Coeff	z-Stat	p-value	Coeff	z-Stat	p-value
Intercept	2.899	4.95***	0.000	2.798	4.54***	0.000
Secondary Enrollment	-0.015	-2.14**	0.032	-0.010	-1.23	0.220
ODA (% GNI)	-0.094	-3.54***	0.000	-0.077	-2.91***	0.004
Population	4.43E-09	1.56	0.119	3.09E-09	1.84*	0.066
GDP per capita	-0.000	1.82*	0.068	-0.000	-1.47	0.142
West Bank	6.343	12.85***	0.000	5.653	3.01***	0.003
Camp David	2.700	4.98***	0.000	2.377	1.83*	0.067
Nb. Obs.	175			175		
Pseudo-R ²	-			-		
LR-Stat chi2 (6 df)	-			44.99		
Vuong Statistic	-			4.01***		

*Note: Equation 1 is a negative binomial regression estimated by pseudo-maximum likelihood with robust standard errors. Equation 2 is a zero-inflated negative binomial regression estimated by maximum likelihood. The explanatory variable Population is inflated in Equation 2. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.*

Sources: ICT database on terrorist events, World Development Indicators (World Bank)

Enrollment in secondary school is significant at the 5-percent level with a negative coefficient in Equation 1, which is a standard negative binomial regression, the most common data-generating process used in the literature. Secondary school enrollment is insignificant with a negative coefficient in Equation 2, which is a zero-inflated negative binomial regression. A preliminary test showed that Population is that only explanatory variable that is significant when inflated, so the inflate function is used only on this variable in Equation 2.

Following the example of Azam and Thelen (2008), ODA was included alongside secondary school enrollment to test if ODA is significant outside of the channel of education. In a reduced-form equation which controls only for GDP per capita and Population, ODA is significantly positively correlated with Terror Supply. However, when two controls for militancy

are included, the coefficient on ODA becomes negative and significant. This shows that ODA was positively correlated with Terror Supply in the reduced-form equation due to an omitted variables bias. ODA is positively correlated with the militancy controls, partly because a disproportionate amount of aid is given to a select group of countries which suffer from an inordinate amount of pre-existing militancy. The two militancy controls—West Bank and Gaza and the “Camp David” countries—are significantly positively correlated with Terror Supply, which is why the omitted variables bias in the reduced-form equation caused the coefficient on ODA to become positive. Once the controls are included, however, it is clear that ODA has a significant negative effect on Terror Supply outside of education. This shows that ODA works to decrease Terror Supply through other channels, such as military might, for example.

It bears mentioning that the Vuong statistic is significant at the 1-percent level in Equation 2. This implies that the zero-inflated negative binomial model is more appropriate than the standard negative binomial. Many papers testing the determinants of the supply of terrorist attacks by a country only use the standard negative binomial model, which may in fact be an inappropriate model based on the above results.

As was previously shown, the data on terrorist attacks from ICT and ITERATE are not strongly correlated, so it is worth running the same test pictured above for the ITERATE data set to test the robustness of the results. Table 9 in the appendix shows that the regression using ITERATE produces results very similar to the regression using ICT. Secondary school enrollment retains its negative coefficient and becomes slightly more significant in both regressions, though it is still insignificant by a hair in the second regression. The Vuong statistic is significant at the 1-percent level, again implying that the zero-inflated negative binomial model may be most appropriate. Each of the militancy dummies is less significant in both equations than they were using the ICT data, and Camp David even becomes insignificant in the second regression. Overall, the first four iterations of Regression #2 give moderately strong evidence that secondary school enrollment is significantly negatively correlated with Terror Supply. The variable is significant in both negative binomial regressions and is nearly significant in the zero-inflated negative binomial regression which uses ITERATE data.

As an additional robustness check, I ran the same regressions using tertiary school enrollment (% gross) instead of secondary school enrollment. The variable was insignificant in all four regressions, perhaps because it exhibits considerably less variation in the sample than secondary school enrollment does. The results using the ICT data are presented in Table 10 in the appendix. Still, it is not completely clear why secondary school enrollment is significant while tertiary school enrollment is not. Based on individual-based studies by Sageman (2008) and Pape (2005), among others, it is clear that many, if not most, terrorists have at least some post-secondary education. Berman and Laitin (2005), Ferrero (2006), and Wintrobe (2006) argue that more educated people, such as college students, tend to be more sensitive to social pressure and tend to form a close circle of friends. This social pressure dimension of tertiary school may cancel out any negative impact general education has on terrorism through the increased chance at economic prosperity it provides. Ultimately, the results show that different levels of education seem to affect a country’s supply of terrorist attacks in different ways, and that promoting upper-level education in a country may not have a significant impact on that country’s supply of terrorist attacks.

Next I ran the same regressions using a measure of overall health in a country—average life expectancy at birth—instead of school enrollment as the social indicator. Using the ICT data, average life expectancy at birth is significantly negatively correlated with terror supply in both the negative binomial and zero-inflated negative binomial regressions. The Vuong statistic in Equation 2 is significant at the 1-percent level, implying that the zero-inflated negative binomial model is most appropriate. Average life expectancy is significant in both regressions while controlling for GDP per capita. This is an interesting result, as it implies that general health conditions have a significant impact on Terror Supply outside of the variable’s correlation with general wealth in a country.

Table 4: Number of Terrorist Events Originating from Each Country (1990-2004) (ICT)

Variables	Equation 1			Equation 2		
	Coeff	z-Stat	p-value	Coeff	z-Stat	p-value
Intercept	5.809	3.86***	0.000	5.726	4.56***	0.000
Ave. Life Expectancy	-0.059	-2.69***	0.007	-0.044	-2.43**	0.015
ODA (% GNI)	-0.116	-4.39***	0.000	-0.096	-4.06***	0.000
Population	4.54E-09	1.53	0.126	1.87E-09	2.35**	0.019
GDP per capita	-0.000	-1.47	0.143	-0.000	-2.15**	0.031
West Bank	6.780	13.65***	0.000	5.441	4.80***	0.000
Camp David	2.916	4.70***	0.000	1.977	2.62***	0.009
Nb. Obs.	181			181		
Pseudo-R ²	-			-		
LR-Stat chi2 (6 df)	-			65.07		
Vuong Statistic	-			19.98***		

*Note: Equation 1 is a negative binomial regression estimated by pseudo-maximum likelihood with robust standard errors. Equation 2 is a zero-inflated negative binomial regression estimated by maximum likelihood. The explanatory variable Population is inflated in Equation 2. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.*

Sources: ICT database on terrorist events, World Development Indicators (World Bank)

I then ran the same two regressions using ITERATE as a robustness check. Table 11 in the appendix shows that average life expectancy becomes insignificant in both regressions. Table 12 in the appendix shows that using average mortality rate under the age of 5 as a different proxy for general health conditions produces nearly identical results in all of the regressions, only with a positive coefficient since the variable is measuring health in terms of death instead of life. Overall, the results on average life expectancy are considerably less robust than those on secondary school enrollment, as using a different terrorism database causes the variable to become insignificant in both regressions.

It might have been interesting to test the effects of average life expectancy and secondary school enrollment in the same regression; however, the two variables are highly correlated (0.85), so including both in the same regression would run the risk of multicollinearity. They were therefore tested separately.

IV. Conclusion

This paper has presented fairly strong evidence that governments tend to increase their overall expenditures on education in response to an increase in U.S. foreign aid, but not in response to an increase in foreign aid in general. The same cannot be said for health expenditures, which do not seem to change significantly in response to a change in either U.S. foreign aid or overall foreign aid received.

The second part of this paper dealt with indirectly testing foreign aid's effect on terrorism through the channel of social spending. Due to obvious endogeneity problems, the effect of public health and education expenditures on terrorism could not be tested directly. Instead, this paper focused on two long-term measures of health and education which are unlikely to cause a problem of reverse causality in the equation. Secondary school enrollment had a significantly negative effect on the supply of terrorism by a country; these results are fairly robust, as they hold up in three out of four alternate specifications. Tertiary school enrollment, on the other hand, was not significantly correlated with the dependent variable—a result which contradicts the findings of Azam and Thelen (2008), the only other known paper which tests the effect of tertiary school enrollment on the supply of terrorism. This shows that the effect of education on terrorism varies depending on the level of education. Average life expectancy at birth was found to have a significant negative effect on the supply of terrorist attacks, implying that overall health levels in a country influences that country's supply of terrorism outside of its obvious correlation with national wealth.

As shown in the introduction, economists have been debating for years about whether economic incentives play a role in an individual's decision whether to commit an act of terrorism. This paper shows that, in general, having a high rate of secondary school enrollment tends to reduce a country's supply of terrorist attacks. This is significant because it is assumed that having more educational capital creates more opportunities for individual prosperity. However, these considerations seem to matter less, or are perhaps offset by a different, unobserved effect, in regard to tertiary education—despite the fact that individuals with a tertiary education will tend to have more economic opportunities than individuals with a secondary education. This should be cause for concern for countries which earmark aid to strategic GWOT countries for education, but further study is needed to show exactly what about tertiary education

creates different incentives (or disincentives) to commit acts of terrorism. Strategies in earmarking foreign aid for health programs seem to merit less consideration in regard to the war on terror, as the results were less robust.

This paper additionally shows that recipient countries tend to increase public spending on education in response to an increase in foreign aid from the United States, but not in response to an increase in ODA. In this instance, the effect of ODA serves as a control, showing that the positive correlation between the change in net DAC (U.S.) and the change in public education expenditures is not simply due to an overall increase in the recipient government's budget, which also occurs when that country receives ODA. This shows that the United States to some extent earmarks its foreign aid for education programs, perhaps because it anticipates that this is an effective tactic for reducing a country's supply of terrorist attacks. Perhaps more than anything, this paper suggests that the United States should perhaps earmark more foreign aid for secondary school programs in the recipient country rather than allowing the country to spend the money indiscriminately on education of all levels.

V. Appendix

Table 5: Number of Events per Source Country (1990-2004) (ICT)

Country Name	Number	Country Name	Number	Country Name	Number
West Bank &					
Gaza	400	France	7	Kenya	2
India	227	Rwanda	7	Kuwait	2
Colombia	97	Venezuela, RB	7	Latvia	2
Israel	58	Cambodia	6	Liberia	2
Iraq	49	Ireland	6	Macedonia, FYR	2
Yemen, Rep.	49	Italy	6	Malaysia	2
Algeria	47	Jordan	6	Myanmar	2
Pakistan	45	Bangladesh	5	Netherlands	2
Angola	41	Ecuador	5	Panama	2
Russian Federation	33	Iran, Islamic Rep.	5	Switzerland	2
Spain	31	Japan	5	Armenia	1
Turkey	28	Afghanistan	4	Croatia	1
		Bosnia &			
Nigeria	26	Herzegovina	4	Czech Republic	1
Sri Lanka	25	Lebanon	4	Eritrea	1
Peru	22	Somalia	4	Guinea	1
Sierra Leone	21	Sudan	4	Honduras	1
Egypt, Arab Rep.	19	United States	4	Libya	1
Philippines	19	Austria	3	Morocco	1
Greece	11	Nepal	3	Nicaragua	1
Indonesia	11	Argentina	2	Norway	1
Tajikistan	11	Azerbaijan	2	Poland	1
Uganda	10	Bolivia	2	Senegal	1
Georgia	9	Chad	2	Sweden	1
Saudi Arabia	9	Chile	2	Tanzania	1
United Kingdom	9	China	2	Thailand	1
South Africa	8	Cuba	2	Tunisia	1
				United Arab	
Bahrain	7	El Salvador	2	Emirates	1
Ethiopia	7	Germany	2	Zambia	1

Source: International Policy Institute for Counter-Terrorism (ICT)

Table 6: Number of Events per Source Country (1990-2004) (ITERATE)

Country Name	Number	Country Name	Number	Country Name	Number
Colombia	253	Morocco	14	Austria	3
United Kingdom	240	France	13	Tunisia	3
Iraq	213	Cuba	13	Australia	3
West Bank and Gaza	141	Guatemala	13	Congo, Rep.	3
Germany	137	Serbia	12	Mexico	3
Somalia	109	Rwanda	11	Papua New Guinea	3
Iran, Islamic Rep.	99	South Africa	10	Romania	3
Turkey	80	Myanmar	10	Togo	3
Philippines	77	Panama	10	Bangladesh	2
Algeria	76	Albania	10	Kenya	2
Greece	75	Korea, Rep.	10	Armenia	2
		Syrian Arab			
Cambodia	74	Republic	10	Poland	2
Peru	70	Ireland	9	Denmark	2
Egypt, Arab Rep.	64	Japan	9	Portugal	2
Yemen, Rep.	62	Argentina	9	Suriname	2
Pakistan	57	Nicaragua	9	Latvia	1
Angola	45	Uganda	8	Macedonia, FYR	1
Afghanistan	43	Bahrain	8	Malaysia	1
Sierra Leone	38	Libya	8	Netherlands	1
Indonesia	38	Burundi	8	Croatia	1
Saudi Arabia	37	Georgia	7	Eritrea	1
Spain	36	Venezuela, RB	7	Thailand	1
Russian Federation	33	Kuwait	7	United Arab Emirates	1
India	31	Honduras	7	Benin	1
Bosnia and					
Herzegovina	28	Israel	6	Congo, Dem. Rep.	1
Lebanon	28	Bolivia	6	Costa Rica	1
Sri Lanka	27	Niger	6	Cote d'Ivoire	1
Chile	27	Nepal	5	Cyprus	1
Italy	26	Azerbaijan	5	Djibouti	1
China	25	Brazil	5	Dominican Republic	1
Jordan	24	Chad	4	Hong Kong, China	1
Sudan	23	Sweden	4	Jamaica	1
Liberia	22	Gabon	4	Mali	1
Nigeria	21	Haiti	4	Namibia	1
Ethiopia	21	Mozambique	4	Slovak Republic	1
El Salvador	18	Singapore	4	Trinidad and Tobago	1
Tajikistan	17	Uzbekistan	4	Uruguay	1
United States	14	Ecuador	3	Zimbabwe	1

Source: International Terrorism: Attributes of Terrorist Events (ITERATE)

Table 7 Change in average public expenditures on education as a percentage of GDP from period 1998-2001 to period 2002-2005

Variables	Coefficient	t-Statistic	p-value
Intercept	0.422	3.66***	0.000
Change in ODA	-0.000	-0.01	0.991
Change in GDP per capita	-0.000	-1.94*	0.055
Change in Population	-1.19E-08	-3.63***	0.000
Nb. Obs.	111		
R ²	.024		
F-Stat	4.91		
p-value	0.003		

Note: Equation estimated by ordinary least squares with robust standard errors. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.

Table 8: Change in average public expenditures on health as a percentage of GDP from period 1998-2001 to period 2002-2005

Variables	Coefficient	t-Statistic	p-value
Intercept	0.151	2.36**	0.020
Change in ODA	-0.010	-0.64	0.521
Change in GDP per capita	-7.69E-06	-0.12	0.901
Change in Population	-3.21E-09	-1.82*	0.070
Nb. Obs.	149		
R ²	.024		
F-Stat	4.91		
p-value	0.003		

Note: Equation estimated by ordinary least squares with robust standard errors. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.

Table 9: Number of Terrorist Events Originating from Each Country (1990-2004) (ITERATE)

Variables	Equation 1			Equation 2		
	Coefficient	z-Statistic	p-value	Coefficient	z-Statistic	p-value
Intercept	3.935	5.96***	0.000	3.374	6.40***	0.000
Secondary Enrollment	-0.018	-2.50**	0.012	-0.012	-1.41	0.158
ODA (% GNI)	-0.088	-3.91***	0.000	-0.073	-3.33***	0.001
Population	4.27E-09	0.46	0.644	1.57E-09	0.73	0.468
GDP per capita	-0.000	0.46	0.642	0.000	0.52	0.601
West Bank	4.302	10.87***	0.000	3.661	2.03**	0.043
Camp David	1.209	1.70*	0.089	0.974	0.77	0.439
Nb. Obs.	175			175		
Pseudo-R ²	-			-		
LR-Stat chi2 (6 df)	-			15.07		
Vuong Statistic	-				3.29***	0.001

*Note: Equation 1 is a negative binomial regression estimated by pseudo-maximum likelihood with robust standard errors. Equation 2 is a zero-inflated negative binomial regression estimated by maximum likelihood. The explanatory variable Population is inflated in Equation 2. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.*

Sources: International Terrorism: Attributes of Terrorist Events (ITERATE), World Development Indicators (World Bank)

Table 10: Number of Terrorist Events Originating from Country (1990-2004) (ICT)

Variables	Equation 1			Equation 2		
	Coefficient	z-Statistic	p-value	Coefficient	z-Statistic	p-value
Intercept	2.024	5.28***	0.000	2.428	6.38***	0.000
Tertiary Enrollment	-0.004	-0.41**	0.683	-0.014	-1.16	0.247
ODA (% GNI)	-0.070	-2.85***	0.004	-0.068	-2.88***	0.004
Population	4.78E-09	1.64	0.102	3.36E-09	1.87*	0.062
GDP per capita	-0.000	-2.91***	0.004	-0.000	-1.27	0.204
West Bank	5.580	12.81***	0.000	5.406	2.93***	0.003
Camp David	2.662	4.32***	0.000	2.447	1.88*	0.059
Nb. Obs.	167			167		
Pseudo-R ²	-			-		
LR-Stat chi2 (6 df)	-			44.52		
Vuong Statistic	-				3.52***	0.000

*Note: Equation 1 is a negative binomial regression estimated by pseudo-maximum likelihood with robust standard errors. Equation 2 is a zero-inflated negative binomial regression estimated by maximum likelihood. The explanatory variable Population is inflated in Equation 2. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.*

Sources: ICT database on terrorist events, World Development Indicators (World Bank)

Table 11: Number of Terrorist Events Originating from Country (1990-2004) (ITERATE)

Variables	Equation 1			Equation 2		
	Coefficient	z-Statistic	p-value	Coefficient	z-Statistic	p-value
Intercept	4.681	2.95***	0.003	4.606	3.47***	0.001
Ave. Life Expectancy	-0.029	-1.34	0.180	-0.021	-1.06	0.290
ODA (% GNI)	-0.075	-2.84***	0.005	-0.067	-3.20***	0.001
Population	5.07E-09	0.48	0.629	9.69E-10	0.64	0.519
GDP per capita	-2.75E-06	-0.08	0.938	2.09E-07	0.01	0.992
West Bank	3.855	8.83***	0.000	3.196	2.06**	0.039
Camp David	0.856	1.37	0.170	0.575	0.54	0.591
Nb. Obs.	181			181		
Pseudo-R ²	-			-		
LR-Stat chi2 (6 df)	-			14.06		
Vuong Statistic	-				2.96***	0.002

*Note: Equation 1 is a negative binomial regression estimated by pseudo-maximum likelihood with robust standard errors. Equation 2 is a zero-inflated negative binomial regression estimated by maximum likelihood. The explanatory variable Population is inflated in Equation 2. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.*

Sources: International Terrorism: Attributes of Terrorist Events (ITERATE), World Development Indicators (World Bank)

Table 12: Number of Terrorist Events Originating from Country (1990-2004) (ICT)

Variables	Equation 1			Equation 2		
	Coefficient	z-Statistic	p-value	Coefficient	z-Statistic	p-value
Intercept	1.389	3.72***	0.000	2.400	10.02***	0.000
Mortality under 5	0.009	2.66***	0.008	0.006	2.44**	0.015
ODA (% GNI)	-0.113	-4.58***	0.000	-0.094	-4.15***	0.000
Population	4.40E-09	1.56	0.118	-0.000	2.30**	0.021
GDP per capita	-0.000	-2.04**	0.042	-0.000	-2.84***	0.005
West Bank	6.649	14.48***	0.000	5.340	4.78***	0.000
Camp David	2.783	4.59***	0.000	1.926	2.54***	0.011
Nb. Obs.	178			178		
Pseudo-R ²	-			-		
LR-Stat chi2 (6 df)	-			65.37		
Vuong Statistic	-				19.05***	0.000

*Note: Equation 1 is a negative binomial regression estimated by pseudo-maximum likelihood with robust standard errors. Equation 2 is a zero-inflated negative binomial regression estimated by maximum likelihood. The explanatory variable Population is inflated in Equation 2. *, **, and *** denote significance at the 10, 5, and 1 percent level, respectively.*

Sources: ICT database on terrorist events, World Development Indicators (World Bank)

Table 13: Regression #1 Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ODA (% GNI)	154	.2941179	6.40473	-27.29343	36.85235
Net DAC (U.S.)	201	4.23E+07	3.06E+08	-5.36E+08	4.12E+09
Pub. educ. expend. (% GDP)	137	.2913047	.9205127	-1.626896	4.11991
Pub. health expend. (% GDP)	185	.2120872	.6616569	-2.364453.96395	
GDP per capita	177	715.3057	1258.731	-370.1047337.16	
Population	191	2022970	7325001	-2200000	8.10E+07

Note: All variables measured as the difference in their average values in the periods 1998-2001 and 2002-2005
Source: World Development Indicators (World Bank)

Table 14 Regression #2 Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Terror (ICT)	201	7.363184	34.01253	0	400
Terror (ITERATE)	201	13.9602	35.72728	0	253
Sec. school enroll. (% gross)	183	66.90062	32.42791	5.727799	146.2188
Tert. School enroll (% gross)	174	23.03368	20.58142	.215419 80	.02145
Average life expectancy	192	65.97519	10.34012	34.38285	80.34346
Average mortality under 5	187	67.72465	66.85089	4.55	295
ODA (% GNI)	194	7.044178	10.6881	-.0158981	61.53102
Net DAC (U.S.)	201	3.51E+07	1.14E+08	-6.09E+07	1.05E+09
GDP per capita	184	5970.577	8672.654	114.7846	40755.17
Population	200	2.90E+07	1.14E+08	19850	1.23E+09

Note: Explanatory variables averaged over the period 1990-2004

Source: Computed from Tables 1 and 2 and the World Development Indicators (World Bank)

VI. References

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