Direct and Indirect Effects of Human Capital on Domestic Terrorism

Aniruddha Bagchi[*]
Department of Economics
Coles College of Business
Kennesaw State University
Kennesaw GA 30144

Ben Scafidi[†]
Department of Economics
Coles College of Business
Kennesaw State University
Kennesaw GA 30144

Abstract

We consider the effect of human capital on domestic terrorism. Our results indicate that human capital increases domestic terrorism and the magnitude of this effect is largest for tertiary education. We also consider the interaction of human capital with some well-known determinants of terrorism such as unemployment, political stability and political repression. We find that political stability interacts positively with human capital. Also, unemployment interacts positively with tertiary education. The interaction of political repression with human capital is not statistically significant. The net effect of human capital on domestic terrorism in a country depends upon how strong each of these factors are. We also consider several extensions of our model. In one such extension, we show that everything else remaining constant, higher primary test scores is associated with more domestic terrorism. These results show that ignorance is not a root cause of domestic terrorism.

[*] Email: abagchi@kennesaw.edu; Phone: (470) 578 6720
[†] Email: bscafidi@kennesaw.edu; Phone: (470) 578 2501

1. Introduction

One of the vexing questions of the current era is how to control the epidemic of terrorism. In order to answer that question, we need to first understand the root cause of terrorism. Several world leaders expressed their opinions on this, and a commonly held view is that poverty and ignorance are the root causes of this phenomenon. For example, Israeli statesman Shimon Peres, while addressing the United Nations in 1995 made the following comment: "We have to address ourselves to the young generation and to education, so that neither poverty nor ignorance will continue to feed fundamentalism, poverty, disillusionment and hatred." Similar statements were made by others also, such as President Bush and Secretary Powell (Bloom 2010, p. 49). In this paper, we are interested in examining if 'ignorance' has any systematic connection with terrorism or not.

This question was first addressed in a well-known empirical paper by Krueger and Maleckova (2003). They collected data on biographies of Palestinian suicide bombers (belonging to Hezbollah) and found no evidence that suicide bombers were less educated than rest of the Palestinian population. One concern is if this conclusion was limited to the case of Palestine or not. To test this, they used macro-level data on several countries and found that educational levels as measured by the rate of illiteracy had no relationship with the number of international terrorist incidents that originate from a country. Their study implies that contrary to the common belief, there is no systematic relationship between ignorance and terrorism.

Several researchers subsequently examined this question. In principle, the relationship between human capital and domestic terrorism can be investigated both at the micro level or at the macro level. Micro level studies tend to focus on the profile of a terrorist and the question they tend to ask is the following: *"What is the level of human capital of a terrorist?"* Apart from Krueger and Maleckova (2003), another well-known paper that takes this approach is Berrebi (2007). Berrebi also arrived at a similar conclusion as Krueger and Maleckova. The reason why suicide bombers are at least as educated as the average person in the population is because suicide bombing is a complex task and terrorist groups often select educated individuals to do this (Bueno de Mesquita 2005). The strength of micro-level studies is that they have more information about the characteristics of suicide bombers. However, there are not completely immune to the severe data limitations that plague research on terrorism. A terrorist group requires many workers to properly function and not all of them are suicide bombers. Other major

tasks for a terrorist organization would be planning attacks, arranging for weapons, raising funds, spreading the message, etc. Therefore, looking at suicide bombers alone would not inform us about the characteristics of members of a terrorist organization. Unfortunately, it is difficult to obtain data on the entire membership of these groups. Therefore, a feasible alternative is to conduct macro-level studies that seek to distinguish the social milieu of countries that are targets of terrorism from countries that are not. For example, one can study if poor countries are more likely to be targets of terrorism relative to rich countries. Terrorism does not exist in a vacuum and social conditions have a role to play in understanding the origins of terrorism. Most of the studies on terrorism are macro level studies and this paper also belongs to this category.

In the literature, there are mixed findings about the relationship between the level of education (a proxy for human capital) and terrorism. Tavares (2004), Bravo and Dias (2006) and Azam and Thelen (2008, 2010) find a negative relationship, that is, everything else remaining constant, a country with a high level of education is expected to suffer less from terrorism. In contrast, Tavares (2004) and Urdal (2006) find a positive relationship. Finally, Kurrild-Klitggard, Justesen and Klemmensen (2006) do not find any relationship between the education level of a country and terrorism.

What can be the reason for such divergent findings? In our opinion, there are at least three key differences between these papers. The first one is that they use different measures of human capital. We elaborate on this aspect later in the paper. A second difference is that they consider different time periods. Since the nature and causes of terrorism can change over time, therefore the importance of human capital may have changed as well. For example, left wing terrorism used to be much more prominent in the 1970s and 1980s but that is no longer the case (Shughart 2006, p.8). A change in the nature of terrorism as well as the tactics of terrorists can change the role of human capital. Finally, while all of the papers mentioned above consider transnational terrorism, some of them examine the characteristics of the country of origin while others perform this exercise for the target. In this paper, we consider domestic terrorism and therefore the debate about whether one should look at the originator or the target loses relevance.

Coming back to the first point, different measures of human capital that have been used are– the literacy rate, enrollment rates (either at secondary schools or university) or the Education Index published by United Nations Development Programme (UNDP). One major weakness of

these measures is that they aggregate information about human capital in a country to an excessive degree. For example, the literacy rate distinguishes between literates and illiterates, but does not provide any further information about the characteristics of the literate population in a country. The Education Index captures the average of the expected years of schooling of a child of school entrance age and the mean years of schooling of the population aged 25 years or more. This is certainly a better measure than the literacy rate but does not provide any information about the distribution of human capital.[3] The enrollment rate does not sweep away information about the distribution of human capital in the same degree as the other measures. However, it a weaker measure of the stock of human capital in a country relative to other measures such as the Education Index. This is because the aggregate stock of human capital in a country is accumulated by generations over many years and need not be highly sensitive to a change in the current enrollment rate.

We use the Educational Attainment Data from Barro and Lee (2010) to capture the characteristics of the distribution of human capital in a country. There are three levels of human capital that we consider- primary, secondary and tertiary. For each category, we compute the proportion of the population that has completed at least that level (that particular level or higher) of education. This is a better measure of the stock of human capital than either enrollment rates (since it does not depend on the change in enrollment rate at a point of time) or the literacy rate (since it distinguishes between different categories of human capital).

This paper also contributes to the literature in another dimension. Most of the literature consider the relationship between human capital and transnational terrorism. However, the vast majority of attacks are domestic terrorist attacks and there is a need to extend the literature to the case of domestic terrorism. The major work the relationship between human capital and domestic terrorism that we are aware of is by Brockhoff, Krieger and Mierrieks (2015). One of their strengths is that they consider several measures of human capital (such as enrollment rates at the primary, secondary and university levels, and the literacy rate) and therefore do not sweep away the variations in the characteristics of human capital across countries. However, the enrollment rate only captures educational choices of young people at the appropriate school going age and

[3] The Inequality adjusted Education Index is a better measure than the Education Index because it adjusts for inequality in education but is available only since 2010.

therefore does not adequately capture the stock of human capital across the entire population. Not surprisingly, the Education Index depends upon expected years of schooling of young cohorts (which is similar to enrollment rate) as well as mean years of schooling of older cohorts. Our data on human capital does not ignore the distribution of human capital but at the same time is a better measure of the quantity of human capital at each level because it is not limited only to young persons.

Our paper is a macro-level study that seeks to answer the following questions:

a. Everything else remaining constant, how does the extent of domestic terrorism change with the distribution of human capital?

b. Is the marginal effect of human capital the same across countries, or does it change depending upon the social milieu?

The paper closest to our work is Brockhoff, Krieger and Mierrieks (2015). Hence, we elaborate our findings using their paper as a benchmark. Brockhoff et al. (2015) find that for their entire sample, lower level of education (such as primary education or literacy rate) tends to increase domestic terrorism but higher levels of education does not have any effect. They also hypothesize that the relationship between human capital and domestic terrorism can depend upon country-specific factors. As a result, they use cluster analysis and create two subsamples of developing and developing countries. They find that lower level of human capital (such as primary education) tends to promote terrorism in developing countries, while higher level of human capital (such as tertiary education) tends to reduce terrorism in more advanced countries.

We also consider the effect of country-specific factors on human capital. However, our hypothesis is that such factors should change the marginal effect of human capital. In other words, we hypothesize that the marginal effect of human capital on domestic terrorism should vary across countries. We use interaction terms to examine this hypothesis. Without interaction terms, we find no statistically significant effect of any kind of human capital on domestic terrorism. However these results change once we allow for interaction terms. Indeed, with such terms, we find a positive and statistically significant effect of tertiary education on domestic terrorism at the sample mean. This result is completely at variance with Brockhoff et al. (2015) who find either no effect of higher education, or a negative effect for the cluster of developed countries. This result indicates

that if persons with tertiary education participate in a terrorist movement, then they tend to be more effective fighters resulting in more deaths from terrorism.

The plan of the paper is as follows: In Section 2, we describe the relationship between human capital and domestic terrorism. In Section 3, we describe our estimation strategy. Sample characteristics as well as the variables used in the study are described in Section 4. The main results are discussed in Section 5. Extensions are considered in Section 6. We conclude in Section 7.

2. Relationship between human capital and domestic terrorism

There are several reasons to suspect that human capital can have a relationship with terrorism. One point of view is that human capital makes a person employable that in turn increases the opportunity cost of committing a crime (Becker 1968). Since terrorism is a form of crime, therefore human capital should decrease the incentive of a person to participate in a terrorist group. This tends to decrease the supply of terrorists. This line of reasoning suggests that human capital has a negative relationship with terrorism.

Second, running a terrorist group is a complex operation. It requires individuals who can raise funds, plan an operation and spread the message effectively. A highly educated person is likely to have these skills (Benmelech and Berrebi 2007). Therefore, more educated members tend to increase the effectiveness of terrorist organizations. As a result, terrorist organizations are more likely to select highly educated persons, even if poorly educated persons are just as interested in joining these groups (Bueno de Mesquita 2005). Consequently, we are likely to observe a positive relationship between human capital and domestic terrorism.

Third, the curriculum can be designed in a way to radicalize students. This means that the relationship between human capital and terrorism depends on what is being taught. Schools are supposed to teach useful skills but sometimes the curriculum can be designed to indoctrinate students to violent causes, such as terrorism. Coulson (2004) discusses the role of schools in Pakistan and Saudi Arabia in this regard. He first described the role Pakistani madrasas play in indoctrinating students as follows: “Though the sight of automatic weapons is not unheard of at militant madrasas, the schools themselves do not generally provide training in physical combat, the use of firearms, or military tactics. Instead, they arm their students with an ideology that justifies and endorses violence against all who fall short of the Islamist ideal” (Coulson 2004, p.4).

However, this problem of indoctrination is not limited only to madrasas and later on in the paper, he commented that Pakistan's state run schools also promote intolerance. Finally, he also described the role of schools in Saudi Arabia as follows: "A third of the school day is taken up by instruction in Wahhabism. Private schools exist but must follow the same Wahhabi religious curriculum as the government schools. All books entering or leaving the kingdom are subject to scrutiny by the state and can be rejected if they are found to conflict with Wahhabist Islam" (Coulson 2004, pp. 8-9). This implies that in countries where education is used to radicalize students, there will be a positive relationship between human capital and terrorism. In other words, if the school curriculum is designed to radicalize students, then an increase in human capital can result in more terrorism. In other countries, where the curriculum is not used to indoctrinate students, there will be a negative relationship.

Finally, there is a literature that suggests that the internet may play a role in radicalizing individuals. There is evidence that extremist groups use a variety of tools in the internet such as password-protected sites, blogs, video-hosting services etc. (Heinke and Hunter 2011). A recent study by RAND Corporation (von Behr et al., 2013) summarized some key hypotheses discussed in the literature and tested them using a sample of 15 radicalized individuals in UK. They concluded that the internet created more opportunities for these individuals to radicalize. In particular, it provided them access to extremist propaganda and allowed them to interact with like-minded individuals. A person needs a reasonable level of education in order to use the internet comfortably. This implies another channel through which more human capital increases terrorism.

We postulate that human capital has both a direct effect as well as an indirect effect on terrorism. It has been pointed out in Azam (2012) that education can change a person's viewpoint and this can have a positive effect on terrorism in some cases and a negative effect on others. Bhui et al. (2014) designed a survey to determine risk factors of radicalization among Muslims in UK. They found that a person was vulnerable to radicalization if he/she was below 20 years of age, was a student, and had a high family income. Notice that being a student is a risk factor. We do not postulate any sign for this direct effect since it is not clear how education changes a person's attitude. We determine the sign of this direct effect empirically.

Apart from the direct effect, we postulate that there can be indirect effects of human capital also. If there is any source of grievance in a country, then it may affect every resident of that

country. However, since educated people are more skillful, they are likely to be associated with deadly attacks. For example, an educated person is likely to plan an attack in a better way and this may result in more deaths. We identified two sources of grievances- the unemployment rate and political repression and we examine how these two sources of grievance interacts with human capital. It has also been mentioned in the literature that political instability is an opportunity for terrorist groups to flourish. We examine the interaction of political stability with human capital and find out whether the harmful effect of political instability is magnified or dampened in the presence of a large stock of human capital.

3. Estimation strategy

Let y_{it} $(i = 1,2, \dots, N; t = 1,2, \dots, T)$ be the number of deaths due to terrorist attacks in country i at year t. Also, let y_{it} be a function of $(h_{it}, \boldsymbol{X_{it}})$ where h_{it} is an index of human capital in country i at year t and $\boldsymbol{X_{it}}$ is a vector of other independent variables. We postulate that

$$E(y_{it}|h_{it}, \boldsymbol{X_{it}}) = \lambda_{it} = \alpha_i + \beta h_{it} + \boldsymbol{\Gamma X_{it}} + \varepsilon_{it}$$

where α_i is a measure of unobserved country-specific characteristics and ε_{it} is the error term. The objective is to consistently estimate the parameters $(\beta, \boldsymbol{\Gamma})$ with the primary focus being the value of β.

Since terrorist attacks are rare events and the number of deaths due to terrorist attacks is a count variable, a starting point is to assume y_{it} follows a Poisson distribution with parameter λ_{it}. It then follows from the properties of the Poisson distribution that $E(y_{it}|h_{it}, X_{it}) = \lambda_{it}$ and $Var(y_{it}|h_{it}, X_{it}) = \lambda_{it}$. One of the criticisms of the use of Poisson distribution is the property that the conditional expectation is equal to the conditional variance. This property is problematic because it is often observed in practice that the variance is much larger than the mean. Therefore, it might seem that the Poisson regression may not be appropriate in this case. This conclusion is however not correct. It follows from prior research (Wooldrige 2010, Chapter 18; Cameron and Trivedi Chapter 17.3.2) that the Poisson regression yields consistent estimates as long as the conditional expectation is correctly specified. Indeed, for consistent estimation, we do not require the conditional expectation to be equal to the conditional variance, nor do we require the dependent variable to follow the Poisson distribution, or even be a count variable. Therefore we estimate the parameters using a Poisson regression and then compute the robust variance matrix.

In the literature, Negative Binomial Regressions have often been used in the analysis of terrorism. However, in the case of panel regressions, Allison and Waterman (2002) have pointed out that 'the conditional negative binomial model for panel data…is not a true fixed-effects method. This method—which has been implemented in both Stata and LIMDEP—does not, in fact, control for all stable covariates.' Because of this problem with the Negative Binomial panel regressions and the robustness of the Poisson panel regressions to distributional misspecifications, we chose to use Poisson regressions throughout this paper.

Consistency also depends upon the correlation between the unobserved heterogeneity α_i and the independent regressors $(h_{it}, \boldsymbol{X_{it}})$. We consider both fixed effects and random effects panel regressions in our analysis. The primary difference between these two approaches is that in order to estimate the parameters consistently, fixed effects panel regressions allow for α_i and the independent regressors to be correlated, while random effects regressions require that this correlation is 0. So, on the one hand, the random effects model requires stronger conditions to consistently estimate the parameters, while on the other hand it is efficient if this condition is met. One method of testing between fixed effects and random effects regressions is to use the Hausman test. However, in our case, the Hausman test statistic is negative. Hence, we used a method suggested by Mundlak (Mundlak 1978; Wooldridge 2010, p. 332) to test between these two models.

4. Data

4.1. Dependent variable: In the literature, the magnitude of terrorism has been measured either by the number of attacks or by the number of deaths. According to Berrebi and Ostwald (2011, p. 387), the number of deaths is a better reflector of the extent of terrorism because it is less susceptible to measurement errors as it is less likely to be manipulated or be affected by cross-country differences in recording. Additionally, every terrorist attack does not have the same impact. Therefore, it is possible that two countries that suffer from the same number of attacks may perceive the risk of terrorism quite differently if the number of deaths is significantly different across the two countries. Hence, we primarily use the number of deaths per country-year as our measure of terrorism. Later on, as a robustness check, we also consider the number of attacks per country-year.

We use the Global Terrorism Database (GTD 2018) to extract information about the number of deaths or the number of attacks. We are interested in the period 1996-2010. Following Enders, Sanders and Gaibulloev (2011), we count an attack as a terrorist attack if it meets all of the following criteria:

(i) The act must be aimed at attaining a political, economic, religious, or social goal.

(ii) There must be evidence of an intention to coerce, intimidate, or convey some other message to a larger audience (or audiences) than the immediate victims.

(iii) The action must be outside the context of legitimate warfare activities.

Further, there are still events that do not seem to be terrorist attacks and GTD classifies them as doubtful events. We drop these doubtful events from our sample also.

The next step is to classify each terrorist attack as domestic or transnational. In principle, a terrorist attack can be classified as transnational based upon any of the following three criteria: (i) the terrorist group's nationality is different from the location of the attack (that is, if the terrorist group crosses an international border in carrying out an attack), (ii) the terrorist group and the victim have different nationalities, and (iii) the victim's nationality is different from the country in which the attack occurs. We classify an attack as domestic if it is domestic on all three counts. Next, let us consider the independent variables.

4.2. Human capital: As mentioned above, human capital is the stock of skills that the labor force possesses (Goldin 2016). It is difficult to accurately measure the economy-wide distribution of skills, particularly in developing economies. Economists have therefore proposed several kinds of approaches such as the cost-based approach, income-based approach and education-based approach (Le Gibson and Oxley 2005, Folloni and Vittadini 2010). We follow the education-based approach in this paper. This approach measures human capital using education output indicators such as literacy rates, enrolment rates, average years of schooling, test scores etc. The underlying assumption is that the skill of a person is closely related to his education, and therefore a person's education is a proxy for his human capital.

We primarily use three measures of human capital called 'Primary or higher Ed', 'Secondary or higher Ed', and 'Tertiary Ed.' Information on these variables have been obtained from the Barro Lee Educational Attainment Dataset (Barro and Lee 2010). Primary or higher Ed

is the percentage of population age 15 or more who have completed at least primary education. Notice that this also includes those who have completed secondary or tertiary education. Any increase of this measure implies a decrease in the proportion of population who are either illiterate, or even if literate, have dropped out before completing primary education. The second variable Secondary or higher Ed is the percentage of population age 15 or more who have completed at least secondary education. Hence, this also includes those who have completed tertiary education. Any increase in this measure implies a reduction in the proportion of the population who are either illiterate or dropped out at the primary level, or dropped out at the secondary level. Finally, the variable Tertiary Ed is the percentage of population age 15 or more who have completed tertiary education.[4]

All of these measures capture the quantity (that is, the stock) of different categories of human capital. As a robustness check, we also consider the quality of different categories of human capital. For this purpose, we use internationally comparable data on quality of human capital from Angrist et al. (2013). These authors construct three series of internationally comparable test scores (for the primary level, secondary level and all levels) as a measure of the quality of human capital in a country. Unfortunately, their data has major issues with missing information. Therefore, we explore the relationship between domestic terrorism and the quality of human capital towards the end of this paper only as an extension of our work.

4.3. Demographic characteristics: There are two variables that capture the demographic characteristics of a country. These are: (i) Population and (ii) Life Expectancy at birth. There are many studies on terrorism (e.g., Krueger and Maleckova 2003, Freytag et al. 2011, Kis-Katos, Liebert and Schulze 2011, Brockhoff, Krieger and Meierrieks 2015 etc.) that control for the population of a country. There are several reasons for this. A highly populated country may suffer more from terrorism simply because it offers more targets. Also, a highly populated country may have demographic stress (such as tension between ethnic or religious groups) and is usually harder to police. For all of these reasons, we expect population to have a positive effect on terrorism.

The other demographic variable that we control for is Life Expectancy at birth. This variable is a measure of the quality of life and is one of the components of the Human Development

[4] Information on this variable is available at 5 year intervals. We assume that it increases linearly from one year to the next.

Index. Individuals have a greater incentive to acquire more human capital if they live longer, that is the demand for human capital is typically positively related with life expectancy. Excluding this variable can result in biased coefficients of human capital. Information on both of these variables is available from the World Development Indicators.

4.4. Political characteristics: There are two variables that capture the political characteristics of a country. These are: (i) Lack of Political Rights, and (ii) Civil War. Information on political rights is available from Freedom House. In this paper, we sometimes use the term 'political repression' to refer to the variable 'Lack of Political Rights.' The role of this variable has been explored in Testas (2004), Abadie (2006), Bandyopadhyay and Younas (2011) etc. These papers find that political rights has an inverted U-shaped relationship with the magnitude of terrorism. In order to capture this feature, we control for both political repression and its square.

Political repression is a source of grievance against the government of a country. Hence, it is possible that political repression may induce even highly educated individuals to join terrorist movements (even though their opportunity costs are high). In that case, terrorist attacks can be more lethal because they are likely to be planned better. In other words, our conjecture is that the marginal effect of human capital will be higher under political repression. In order to test this conjecture, we consider the interaction of human capital and political rights in our regressions.

Freytag et al. (2011) in their study of the determinants of terrorism control for the prevalence of civil wars. It is possible that some of the domestic terrorist attacks occur because of an ongoing civil war. As Freytag et al. (2011) point out, insurgents many use terrorism in cities and guerilla tactics in less protected regions. Information about civil wars is obtained from the UCDP/PRIO Armed Conflict Dataset (Gleditsch, Wallensteen, Eriksson, Sollenberg & Strand 2002 and Themnér and Wallensteen 2014). Our measure of civil war is a dummy variable that takes a value of 1 if there is any internal armed conflict in a country.

4.5. Economic Characteristics: We use three variables to control for the economic characteristics of a country. These are: (i) GDP per capita (in Purchasing Power Parity), (ii) Trade Openness, and (iii) Unemployment rate. GDP per capita is related to the average standard of living in a country. It has been used as an independent variable in many studies of terrorism such as Abadie (2006), Bandyopadhyay and Younas (2011), Freytag et al., (2011), Kis-Katos, Liebert and

Schulze (2011) etc. Since we want GDP per capita to reflect affordability, therefore we measure this in terms of purchasing power parity.

Trade openness is defined to be the ratio of exports and imports to GDP. This variable has been used in Freytag et al. (2011) and Brockhoff, Krieger and Meierrieks (2015). Trade openness is usually associated with high levels of economic growth. Second, trade openness can have some undesirable consequences, such as unemployment. This may divert public funds to help those affected adversely by globalization. As a result, the government may be forced to reduce its expenditure on education. Therefore, the net impact of trade openness on terrorism is not clear and can only be resolved empirically.

Feldmann and Perala (2004) and Piazza (2006) have examined if unemployment causes terrorism or not. The reason why this is a plausible relationship is the fact that unemployment reduces the opportunity cost of joining a terrorist movement and can potentially increase the supply of terrorists. None of the above two studies find any relationship between unemployment and terrorism.

Our conjecture is that the relationship between unemployment and terrorism is more complex than what has been considered in the literature so far. It is plausible that highly educated individuals will resent being unemployed much more than poorly educated individuals. In particular, a poorly educated individual would be aware that his chance of finding employment is low anyway, and even if he were to be employed, his wage rate would likely be quite low. Therefore, the loss to a poorly educated individual from being unemployed is not that much. A highly educated individual would however expect to be employed and would also expect a high wage rate. Therefore, unemployment is relatively costly to a highly educated individual. Consequently, highly educated individuals are likely to react more to a situation of high unemployment by joining a terrorist movement. In other words, if we compare two countries with high unemployment rates that are otherwise identical except for the fact that the first country has more highly educated individuals than the second one, then the first country is likely to suffer more from terrorism. In order to test this conjecture, we interact unemployment with the quantity of human capital in a country-year.

4.6. Defensive capability: A country with better defensive capabilities should be able to better defend against terrorism. We control for the defensive capability of a country using its military expenditure as a proportion of GDP. This variable has been used in Freytag et al. (2011). Military expenditure is also related with human capital in a country because more military expenditure can potentially force a government to divert resources from other public services, such as education.

4.7. Political stability: The effect of political stability on terrorism has been examined by other researchers. Kis-Katos, Liebert and Schulze (2011) find that failing states are associated with more terrorist attacks. An unstable state may not be able to police its entire territory effectively and this allows terrorist groups to operate easily in those areas (Piazza 2008). We include political stability as one of our independent variables to control for this effect.

Political instability is not really a grievance against the government in the way political repression is. Instability represents an opportunity. In the absence of strict governmental control, it is possible for warlords to operate easily and make money by indulging in criminal activities such as extortion. In a situation of anarchy, terrorist groups do not face any major challenge from the government and therefore have less incentive to hire educated people. However, if the country is politically stable, then the government is better able to control its territory and terrorist groups find it harder to fight the government. Hence, they have a stronger incentive to hire educated people and we expect to see a positive interaction between human capital and political stability. This interaction term is therefore included in our regressions. We obtain data on political stability from World Governance Indicators (Kaufmann, Kraay and Mastruzzi 2010).

4.8. Sample: There are 124 countries included in our sample and they are listed in the Appendix. We consider 14 years in our regressions (1997-2010 for the dependent variable and 1996-2009 for the independent variables). Hence, the maximum possible number of observations in our regressions is 1736. However, due to some missing values, we lose 120 observations (around 7%). The resulting sample size is therefore 1616 and the characteristics of this sample is presented in Table 1. Out of the 124 countries that we consider, 46 have at least one death due to domestic terrorism during the period of study. However, two of these- Liberia and Gabon have missing values for other independent variables. Hence, only 44 countries are included in the fixed effects regressions. We present the characteristics of this restricted sample in Table A.1 in the Appendix.

A simple visual inspection of these two samples indicates that the countries affected by domestic terrorism on an average tend to be poorer, are more likely to suffer from political instability and a civil war, and are less likely to respect political rights. They also tend to have a larger population.

5. Results

Our main results are presented in Tables 2 and 3. First, let us consider the baseline scenario, which is our estimates without interaction terms. These results are presented in Table 2. Later, we include the interaction terms in Table 3 and examine their impact.

5.1. **Regressions without interaction terms:** We first consider regressions without interaction terms. This approach has been generally used in the literature. We present results of both fixed effects as well as random effects regressions. However, it follows from the Mundlak test that fixed effects regressions are more appropriate in our case (p value<1%).[5]

It follows from Table 2 that among the three measures of human capital, only the quantity of tertiary education has a positive coefficient. Regardless of the sign, none of the coefficients are statistically significant at the 10% level, although the coefficient of tertiary education is close (p value of 12.4% for the fixed effects model and 12.7% for the random effects model). We find that an increase of one standard deviation of the percentage of population with at least primary education decreases the number of deaths due to domestic terrorism by around 30% (for both fixed effects and random effects). Moreover, a one standard deviation increase of the population with at least secondary education decreases the number of deaths due to domestic terrorism by around 40%. Finally, we find that a one standard deviation increase in the percentage of population with tertiary education almost doubles the number of deaths due to domestic terrorism. Our results therefore indicate that tertiary education increases domestic terrorism, while the other measures of human capital are predicted to decrease domestic terrorism.

In Table 2 of this paper, we also find that certain other variables tend to have a statistically significant effect on domestic terrorism. We find that political stability tends to decrease the number of deaths due to domestic terrorism and this is statistically significant at the 10% level. This is consistent with the prior work such as Kis-Katos, Liebert and Schulze (2011) and Piazza

[5] The Hausman test statistic is negative. Hence, we follow the Mundlak approach to choose between fixed effects vs. random effects.

(2008). Also, a country with an ongoing civil war tends to suffer more from domestic terrorism. In particular, we find that everything else remaining constant, the number of killings due to domestic terrorist attacks tend to double when a country suffers from civil war (relative to a similar country without a civil war). Moreover, higher military expenditure tends to have a negative and statistically significant effect on domestic terrorism.

We also find that poorer countries suffer more from domestic terrorism and this effect is statistically significant. It follows from the fixed effects regressions that everything else remaining constant, a $1000 increase in per capita income (in PPP terms) reduces domestic terrorism by 12.4% to 15% depending on the specification.

Finally, more populated countries suffer more from domestic terrorism and this effect is also statistically significant. The fixed effects regressions in Table 2 suggest that everything else remaining constant, a one hundred million increase in population increases domestic terrorism by about 2.5 times.

In summary, we do not find any statistically significant effect of human capital on domestic terrorism in Table 2. This is at odds with much of the literature (mentioned in the introduction) which generally finds some relationship between human capital and terrorism. We believe that a linear relationship between human capital and domestic terrorism as has been assumed in Table 2 is too simplistic because it aggregates too many factors that determine the relationship between these two variables. However, once we take into account the various channels through which human capital affects domestic terrorism, then the marginal effect of human capital need not be a constant as is assumed in a linear model. In the next section, we consider a different approach that allows for the marginal effect of human capital to vary.

5.2. **Regressions with interaction terms:** In this section, we postulate that there is both a fixed component as well as a variable component of the marginal effect of human capital on domestic terrorism. We call the fixed component the 'direct effect' and the variable component the 'indirect effect.' In our specification, the variable components are accounted for by the interaction of human capital with unemployment, political repression and political stability. Previous research has examined the role of each of these variables as determinants of terrorism. We argue below that there are plausible reasons to believe that these variables can affect educated

members of a population differently from the uneducated or poorly educated sections of the population and therefore the marginal effect of human capital can depend on the values of these variables. The results with the interaction terms are in Table 3 in which we present results of both fixed effects as well as random effects regressions. However, it follows from the Mundlak test that fixed effects regressions are more appropriate in our case (p value<1%). Hence, we discuss the results of only fixed effects regression below.

It follows from Table 3 that the coefficient of human capital (that is, the direct effect) is positive in all cases. This effect is statistically significant at the 1% level when we consider the quantity of tertiary education and at the 5% level when we consider the quantity of any kind of education (primary or higher). Therefore the direct effect increases domestic terrorism and its effect is most pronounced in the case of tertiary education (because of the large value of the coefficient).

There are three kinds of indirect effects considered, each of which is captured by the coefficient of the interaction between human capital and a relevant independent variable. The first interaction is between unemployment and human capital. Unemployment imposes costs on educated persons because it forces them to forego wages they could have earned if employed. The unemployment cost is not so much for those with no or little human capital because they are likely to be unemployed even in a booming economy. Unemployment therefore creates grievances and the grievance is likely to higher among educated people. Such a grievance can plausibly induce educated people to participate in terrorist movements. It follows from Table 3 that the coefficient of this interaction term is positive and statistically significant at the 1% level for the case of tertiary education. This means that if unemployment is prevalent, tertiary education exerts a harmful effect on domestic terrorism. The interaction term of unemployment with the other two measures of human capital are not statistically significant.

Next, let us consider the interaction of human capital and political stability. This coefficient is positive and statistically significant at either the 1% level or the 5% level (depending upon the measure of human capital). This means that political stability tends to have a positive effect on the marginal effect of human capital on domestic terrorism. Conversely, political instability tends have a negative impact on the marginal effect of human capital. As mentioned previously, educated individuals help terrorist groups by planning attacks, raising funds, organizing propaganda etc. In

a politically unstable country, domestic terrorist groups have little incentive to hire educated individuals because they do not face any challenge from the government and therefore do not see any value in recruiting educated persons. As a result, the marginal effect of human capital on domestic terrorism tends to be low in politically unstable countries. In a politically stable country, the government is better able to control its territory. Hence, if there are sufficient reasons for terrorist groups to operate (such as, if there are grievances), it would be imperative to run the groups more efficiently. This would require recruiting persons with more human capital. Therefore, everything else remaining constant, we expect the marginal effect of human capital on domestic terrorism to increase with political stability.

Finally, notice that the interaction term of human capital and lack of political rights (political repression) is negative but statistically insignificant in all of the specifications. The lack of statistical significance of this interaction term means that there is no perceptible change in the marginal effect of human capital on domestic terrorism due to a change in political rights.

In summary, several factors such as unemployment and political instability tend to change the marginal effect of human capital (particularly tertiary education) on domestic terrorism. The net effect of human capital depends on the coefficient of human capital (its direct effect), the coefficients of the interaction terms, and the values of three independent variables- unemployment rate, political repression and political stability. It follows from the fixed effects regressions in Table 3 that at the sample mean, a one standard deviation increase in the proportion of population with at least primary education increases domestic terrorism by 55% and this is statistically significant at the 10% level. Without the interaction terms, the marginal effect is -30% and this is not statistically significant. Therefore when we consider interaction terms, both the significance and the sign changes for this measure of human capital. It also follows from the fixed effects regressions in Table 3 that at the sample mean, a one standard deviation increase in the proportion of population with tertiary education increases domestic terrorism by 5 times and this is statistically significant at the 1% level. Without the interaction terms, domestic terrorism merely doubles due to a corresponding increase in human capital and that is not statistically significant.[6]

[6] When human capital is measured by tertiary education, the standard deviation is almost equal to the mean. For other measures, the standard deviation is around a third of the mean. This explains why the marginal effects are so

In the relevant literature, Brockhoff et al. (2015) is the only other paper we are aware of that has considered the influence of country-specific conditions while evaluating the effect of human capital on domestic terrorism. For their entire sample, they found that lower levels of education (such as primary education) tend to be positively associated with domestic terrorism, but tertiary education is not associated with domestic terrorism. Using cluster analysis, they also split up their sample of countries into two sets based upon country specific characteristics. One set comprised of developing countries and the other one comprised of developed countries. They found that for the set of developing countries, higher education has no effect on domestic terrorism but lower level of education has a positive effect on domestic terrorism. For the set of developed countries, they found that tertiary education tends to have a negative association with domestic terrorism.

Using the interaction terms, we find that at the sample mean, all kinds of human capital tend to have a positive association with domestic terrorism. In particular, the positive association between primary or higher education and domestic terrorism that we find in this paper is similar to the relationship between lower level of education and domestic terrorism in Brockhoff et al. (2015). However, there is a major difference in these two papers for the case of tertiary education. While we find a large and statistically significant positive association between tertiary education and domestic terrorism, Brockhoff et al. (2015) either find no relationship or a negative relationship.

6. Robustness checks and extensions

In this section, we examine how the results change in response to slight modifications in the regression results.

6.1. **Number of incidents as the dependent variable**: In this paper, we measure the impact of domestic terrorism by the number of deaths due to such attacks. However, another possible way of measuring the impact of domestic terrorism is by counting the number of incidents. This is a common approach in the literature and has been taken by many other papers such as Krueger and Maleckova (2003), Testas (2004) Azam and Thelen (2008), Brockhoff et al. (2015) etc. We consider such an approach in Table 4. In this table, we present the results of fixed effects

much bigger for a one standard deviation increase of tertiary education. In this case, such an increase leads to almost a doubling of the mean.

regressions where the dependent variable is the number of domestic terrorist attacks. Notice that the coefficient of tertiary education is positive and statistically significant at the 5% level both with and without the interaction terms. Without the interaction terms, we predict that a one standard deviation increase in the proportion of population with tertiary education will double the number of domestic terrorist attacks. With the interaction terms, we predict that at the sample mean the same increase in tertiary education will increase the number of domestic terrorist attacks by four times. These magnitudes are comparable to those obtained in the section above.

The major takeaway from this table is that the interaction terms have the same sign as in Table 3. Therefore, even in this case, unemployment and political stability tends to increase the marginal impact of human capital, particularly tertiary education. Also, the interaction of political rights with human capital is not statistically significant in all cases.

6.2. Effect of domestic terrorism in the past: It is typically observed that once a terrorist movement gains traction, then it results in violence for a few years at a stretch till the government of the country either capitulates or succeeds in overpowering it. Therefore, the number of killings in a certain year tends to be correlated with the number of killings in the previous year. We therefore check if this changes the results significantly in the fixed effects model. The results are in Table 5.

The coefficient of the number of killings in the previous year is positive but not statistically significant. Our conclusions regarding the effect of human capital remain the same. Without the interaction effects, only tertiary education has a positive and statistically significant coefficient. The interaction of political stability with human capital is positive and statistically significant for all three measures of human capital. The interaction of unemployment and tertiary education is positive and statistically significant, which is same as what we obtained above. The interaction of political rights with human capital is never significant, for any measure of human capital. Therefore the key results do not change when we additionally control for the number of deaths due to domestic terrorism in the previous year.

6.3. Effect of quality of human capital on domestic terrorism: So far, we examined the effect of the quantity of different categories of human capital on domestic terrorism. One might want to know how the results change if we consider the quality of human capital instead. To

examine this point, we use internationally comparable data on quality of human capital from Angrist et al. (2013). In their data, quality of human capital is measured by three series of internationally comparable test scores (for the primary level, secondary level and all levels). Unfortunately, there are many missing values. In particular, the number of observations in the complete sample is only 253 or less and this is quite small relative to the number of observations used in Tables 2 and 3. Hence, even though education quality is a better measure of human capital than education quantity, we present the results of this section only as an extension of our paper. Fixed effects regressions on test scores are presented in Table 6.

We find that everything else remaining constant, an increase in primary test score has a positive and statistically significant effect (at the 1% level) on the number of killings due to domestic terrorism. Without the interaction term, the regression results suggest that a one unit increase in the primary test score will increase the number of deaths due to domestic terrorism by approximately 86%. When we include the interactions terms, a one unit increase in primary test scores from the sample mean increases the number of deaths due to domestic terrorism by 153%. However, the marginal effect of higher test scores is not statistically significant when we consider secondary level test scores or overall scores.

Regarding interaction terms, an interesting aspect is that the interaction of primary or overall test scores and political repression is negative and statistically significant at the 5% level. This means that the marginal impact of higher primary or overall test scores on domestic terrorism decreases with more political repression. When political repression increases, then two counteracting changes occur. On the one hand, there are more grievances against a government and this induces more people to join terrorist groups. However, on the other hand, the regime is better able to counter terrorist groups by resorting to coercive means. Our results indicate that the latter effect dominates.

Since there are lots of missing observations on test scores, a concern is if the sample used in the analysis of test scores has the same characteristics as the sample used in the rest of the paper. In order to examine this issue, we present the summary statistics of the sample used in the regressions on test scores in Table A.2. A comparison of Tables A.1 and A.2 indicates that test score data are generally missing for countries that are poorly governed and suffer the most from domestic terrorism. To see this, note that the number of deaths and number of incidents are much smaller in Table A.2. Also, in Table A.2, the means of the following variables are higher: (a) all

three measures of the quantity of human capital, (b) life expectancy, (c) political stability, (d) political rights and (e) GDP per capita, while the mean population is less. Therefore, the sample used in the analysis of test scores is not strictly comparable to the one used in the rest of the paper. The relationship between quality of human capital and domestic terrorism can be examined in future research once better quality data becomes available.

7. Concluding remarks

The primary question we are interested in is if there is evidence to conclude that ignorance causes domestic terrorism. In order to answer this question, we use the quantity of human capital to measure the level of knowledge in a country. One of the key results we find is that everything else remaining constant, human capital increases domestic terrorism but the magnitude of this effect is substantially larger for the case of tertiary education. The fact that tertiary education has an effect on domestic terrorism implies that domestic terrorism is not caused by ignorance.

Then we consider several well-known factors of domestic terrorism such as unemployment, political stability and political repression and examine how they interact with human capital. The results indicate that political stability increases the marginal effect of human capital on domestic terrorism for all measures of human capital used in the paper. We also find that unemployment increases the marginal effect of tertiary education. Finally, we find that political repression does not have any perceptible impact on the marginal effect of human capital. We also consider several extensions and show that the basic results continue to hold.

There is scope to extend this research even further. In our opinion, the content of education should also matter. For example, if education is used in a country to spread hatred towards foreigners, minorities etc., it is expected that more attacks will originate in that country. We are not aware of a good data source for the content of education across countries and therefore leave this point for future research.

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List of Countries:

Asterisks indicate countries with positive number of deaths due to domestic terrorism.

Afghanistan*, Albania, Algeria*, Armenia*, Australia, Austria, Bahrain, Bangladesh*, Belgium, Benin, Bolivia, Botswana, Brazil, Bulgaria, Burundi*, Cambodia*, Cameroon, Canada, Central African Republic, Chile, China*, Colombia*, Congo, Rep., Rep., El Salvador, Estonia, Fiji, Finland, France*, Gabon, Gambia, Ghana, Greece*, Guatemala, Guyana, Honduras, China, Hungary, India*, Indonesia*, Iran*, Iraq*, Ireland, Israel*, Italy*, Jamaica*, Japan, Jordan,

Kazakhstan*, Kenya*, Korea Rep., Kuwait, Kyrgyz Republic, Lao PDR, Latvia, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Malawi, Malaysia*, Mali, Mauritania, Mauritius, Mexico*, Mongolia, Morocco, Mozambique, Namibia, Nepal*, Netherlands*, New Zealand, Nicaragua*, Niger*, Norway, Pakistan*, Panama, Papua New Guinea, Paraguay*, Peru*, Philippines*, Poland, Portugal, Qatar, Russian Federation*, Rwanda, Saudi Arabia*, Senegal*, Sierra Leone*, Singapore, Slovak Republic, Slovenia, South Africa*, Spain*, Sri Lanka*, Sudan*, Swaziland*, Sweden, Switzerland, Tajikistan, Tanzania, Thailand*, Togo, Trinidad and Tobago, Tunisia, Turkey*, Uganda*, Ukraine, United Arab Emirates, United Kingdom, United States*, Uruguay, Venezuela, Vietnam, Yemen*, Zambia, Zimbabwe*

Table 1: Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
No. Killed	1616	16.08	80.26	0	1072
No. of Incidents	1616	5.23	27.30	0	540
Primary or higher Ed	1616	0.48	0.18	0.07	0.86
Secondary or higher Ed	1616	0.31	0.20	0.01	0.85
Tertiary Ed	1616	0.07	0.06	0.00	0.28
Overall Score	838	44.81	9.42	14.06	62.70
Secondary Score	647	50.08	6.58	26.42	62.70
Primary Score	603	38.74	7.76	14.06	53.59
Life Expectancy	1616	67.88	10.38	35.14	82.93
Political Stability	1616	-0.10	0.94	-3.18	1.67
Lack of Political Rights	1616	3.25	2.07	1	7
Civil War	1616	0.16	0.37	0	1
Military Expenditure	1616	0.02	0.02	0.00	0.14
GDP per capita (PPP)	1616	13.83	16.53	0.36	122.25

Trade Openness	1616	0.83	0.50	0.16	4.40
Unemployment Rate	1616	0.09	0.06	0.00	0.39
Population (in 100 m.)	1616	0.47	1.58	0.00	13.31

Note: In the regressions, the independent variables have been lagged by one year. Hence, in this table, summary statistics are for the following period:

No. of Incidents and No. Killed: 1997-2010

Other Variables: 1996-2009.

Table 2: Effect of Human Capital on No. Killed due to Terrorist Attacks (without Interaction Effects)

	Primary or higher (FE)	Primary or higher (RE)	Secondary or higher (FE)	Secondary or higher (RE)	Tertiary (FE)	Tertiary (RE)
Dependent Variable: No. Killed$_t$						
Primary or higher Ed$_{t-1}$	-2.08	-2.03	-	-	-	-
	(2.67)	(2.64)				
Secondary or higher Ed$_{t-1}$	-	-	-2.66	-2.62	-	-
			(3.00)	(2.96)		
Tertiary Ed$_{t-1}$	-	-	-	-	10.92	10.76
					(7.10)	(7.05)
Life Expectancy$_{t-1}$	-0.21*	-0.20	-0.21	-0.19	-0.13	-0.12
	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)	(0.13)
Political Stability$_{t-1}$	-0.57*	-0.58*	-0.55*	-0.56*	-0.59*	-0.60*
	(0.31)	(0.31)	(0.32)	(0.32)	(0.34)	(0.34)
Lack of Political Rights$_{t-1}$	0.50	0.52	0.56	0.58	0.86	0.87
	(0.82)	(0.81)	(0.79)	(0.79)	(0.81)	(0.81)

Lack of Political Rights sq. $_{t-1}$	-0.05	-0.05	-0.06	-0.06	-0.09	-0.09
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Civil War$_{t-1}$	0.71**	0.72**	0.71***	0.71***	0.77***	0.78***
	(0.28)	(0.28)	(0.27)	(0.27)	(0.28)	(0.28)
Military Expenditure$_{t-1}$	-45.61*	-44.91*	-46.07*	-45.30*	-53.41**	-52.49**
	(23.86)	(23.85)	(23.58)	(23.61)	(20.74)	(20.94)
GDP per capita (PPP)$_{t-1}$	-0.14***	-0.13**	-0.13***	-0.12**	-0.16***	-0.15***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)
Trade Openness$_{t-1}$	-0.61	-0.62	-0.61	-0.61	-0.77	-0.77
	(0.66)	(0.67)	(0.66)	(0.66)	(0.67)	(0.67)
Unemployment Rate$_{t-1}$	2.87	2.78	3.02	2.93	2.32	2.27
	(3.28)	(3.28)	(3.26)	(3.27)	(3.14)	(3.14)
Population$_{t-1}$	1.21***	1.21***	1.26***	1.27***	1.23***	1.235***

	(0.29)	(0.29)	(0.29)	(0.29)	(0.34)	(0.34)
Constant	-	19.18	-	18.54	-	12.60
		(11.16)		(11.02)		(11.26)
Ln Alpha	-	3.12	-	3.11	-	3.08
		(2.20)		(2.21)		(2.50)
Obs.	588	1616	588	1616	588	1616
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Countries	44	124	44	124	44	124
AIC	14697.40	15435.70	15114.50	15848.90	14615.60	15346.20
BIC	14815.50	15592.00	15232.70	16005.20	14733.80	15502.50
Log Likelihood	-7321.7	-7688.9	-7530.3	-7895.5	-7280.8	-7644.1
Wald	47792.7***	38490.7***	33933.4***	41233.8***	103952.5***	120770.9***

Standard Errors in parentheses

*** Significant at the 1% level

** Significant at the 5% level

* Significant at the 10% level

Table 3: Effect of Human Capital on No. Killed due to Terrorist Attacks (with Interaction Effects)

	Primary or higher (FE)	Primary or higher (RE)	Secondary or higher (FE)	Secondary or higher (RE)	Tertiary (FE)	Tertiary (RE)
Dependent Variable: No. Killed$_t$						
Primary or higher Ed$_{t-1}$	9.59**	9.57**	-	-	-	-
	(4.19)	(4.21)				
Secondary or higher Ed$_{t-1}$	-	-	7.98*	7.88*	-	-
			(4.44)	(4.44)		
Tertiary Ed$_{t-1}$	-	-	-	-	29.40***	29.06***
					(9.75)	(9.63)
Life Expectancy$_{t-1}$	-0.35***	-0.34***	-0.35**	-0.38**	-0.23*	-0.22*
	(0.11)	(0.12)	(0.14)	(0.14)	(0.13)	(0.13)
Political Stability$_{t-1}$	-3.05***	-3.03***	-1.63***	-1.62***	-1.68***	-1.67***
	(0.89)	(0.89)	(0.58)	(0.58)	(0.43)	(0.43)
Lack of Political Rights$_{t-1}$	0.94	0.96	1.01	1.02	0.78	0.81
	(1.01)	(1.01)	(0.97)	(0.96)	(0.69)	(0.69)

Lack of Political Rights sq. $_{t-1}$	-0.07	-0.08	-0.08	-0.08	-0.08	-0.08
	(0.09)	(0.09)	(0.09)	(0.09)	(0.07)	(0.07)
Civil War$_{t-1}$	0.65**	0.66**	0.67**	0.68**	0.70**	0.71**
	(0.32)	(0.32)	(0.34)	(0.34)	(0.29)	(0.29)
Military Expenditure$_{t-1}$	-35.51*	-34.96*	-39.21*	-38.64*	-47.80**	-47.01**
	(20.62)	(20.67)	(20.79)	(20.83)	(19.80)	(19.96)
GDP per capita (PPP)$_{t-1}$	-0.18***	-0.17***	-0.14**	-0.14**	-0.20**	-0.19**
	(0.06)	(0.06)	(0.06)	(0.06)	(0.08)	(0.09)
Trade Openness$_{t-1}$	-0.27	-0.28	-0.28	-0.29	-0.98	-0.99
	(0.60)	(0.60)	(0.66)	(0.66)	(0.72)	(0.73)
Unemployment Rate$_{t-1}$	5.38	5.32	5.78	5.59	-5.26	-5.36
	(11.64)	(11.70)	(5.73)	(5.76)	(4.41)	(4.44)
Population$_{t-1}$	0.80***	0.80***	0.94***	0.95***	1.19***	1.20***
	(0.24)	(0.24)	(0.28)	(0.28)	(0.34)	(0.35)
Primary or higher*Unemployment$_{t-1}$	1.15	1.07	-	-	-	-
	(26.39)	(26.43)				
Primary or higher*Political Stability$_{t-1}$	6.39***	6.33***	-	-	-	-
	(2.09)	(2.09)				
Primary or higher*Lack of Political Rights$_{t-1}$	-0.69	-0.69	-	-	-	-
	(0.82)	(0.82)				

Secondary or higher*Unemployment$_{t-1}$	-	-	-4.46	-3.96	-	-
			(22.20)	(22.01)		
Secondary or higher*Political Stability$_{t-1}$	-	-	4.86**	4.79**	-	-
			(2.41)	(2.39)		
Secondary or higher*Lack of Political Rights$_{t-1}$	-	-	-1.08	-1.07	-	-
			(0.86)	(0.86)		
Tertiary*Unemployment$_{t-1}$	-	-	-	-	180.1***	181.3***
					(62.79)	(62.91)
Tertiary*Political Stability$_{t-1}$	-	-	-	-	21.35***	21.12***
					(5.61)	(5.58)
Tertiary*Lack of Political Rights$_{t-1}$	-	-	-	-	-0.19	-0.25
					(1.97)	(1.98)
Constant	-	24.45***	-	25.63**	-	19.18
		(9.40)		(11.62)		(11.34)
Ln Alpha	-	3.38	-	3.33	-	3.28
		(2.06)		(2.09)		(2.28)
Obs.	588	1616	588	1616	588	1616
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Countries	44	124	44	124	44	124

AIC	14697.40	15435.70	15114.50	15848.90	14615.60	15346.20
BIC	14815.50	15592.00	15232.70	16005.20	14733.80	15502.50
Log Likelihood	-7321.7	-7688.9	-7530.3	-7895.5	-7280.8	-7644.1
Wald	47792.7***	38490.7***	33933.4***	41233.8***	103952.5***	120770.9***

Standard Errors in parentheses

*** Significant at the 1% level

** Significant at the 5% level

* Significant at the 10% level

Table 4: Effect of Human Capital on No. of Terrorist Attacks: Fixed Effects

	Primary or higher (without Interactions)	Primary or higher (with Interactions)	Secondary or higher (without Interactions)	Secondary or higher (with Interactions)	Tertiary (without Interactions)	Tertiary (with Interactions)
Dependent Variable: No. Killed$_t$						
Primary or higher Ed$_{t-1}$	0.52	7.50*	-	-	-	-
	(2.23)	(4.44)				
Secondary or higher Ed$_{t-1}$	-	-	-0.68	6.63	-	-
			(2.98)	(4.63)		
Tertiary Ed$_{t-1}$	-	-	-	-	13.14**	17.30**
					(5.25)	(7.99)
Life Expectancy$_{t-1}$	0.00	-0.08	-0.02	-0.09	0.03	-0.03
	(0.12)	(0.11)	(0.12)	(0.11)	(0.11)	(0.09)
Political Stability$_{t-1}$	-0.38	-2.07***	-0.42	-1.35***	-0.50*	-1.27***
	(0.28)	(0.58)	(0.30)	(0.50)	(0.27)	(0.39)
Lack of Political Rights$_{t-1}$	0.69*	0.57	0.59*	0.56	0.87**	0.64**
	(0.40)	(0.47)	(0.35)	(0.44)	(0.39)	(0.29)
Lack of Political Rights sq. $_{t-1}$	-0.07*	-0.07*	-0.06*	-0.06*	-0.094**	-0.07**
	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.03)
Civil War$_{t-1}$	0.41	0.45**	0.39	0.46**	0.42	0.47*
	(0.30)	(0.22)	(0.30)	(0.22)	(0.34)	(0.27)

Military Expenditure$_{t-1}$	-50.19*	-43.18*	-47.36	-41.49*	-56.49**	-51.25**
	(29.73)	(23.62)	(29.48)	(22.19)	(23.30)	(20.80)
GDP per capita (PPP)$_{t-1}$	-0.11*	-0.15**	-0.12*	-0.17**	-0.15***	-0.20***
	(0.06)	(0.06)	(0.06)	(0.07)	(0.05)	(0.06)
Trade Openness$_{t-1}$	0.00	0.24	0.05	0.27	-0.29	-0.41
	(0.70)	(0.75)	(0.71)	(0.73)	(0.70)	(0.78)
Unemployment Rate$_{t-1}$	-1.40	4.10	-1.22	0.46	-1.91	-9.05***
	(2.13)	(10.61)	(2.30)	(4.57)	(2.03)	(3.33)
Population$_{t-1}$	1.616***	1.40***	1.63***	1.44***	1.82***	1.75***
	(0.28)	(0.36)	(0.29)	(0.32)	(0.36)	(0.38)
Primary or higher*Unemployment$_{t-1}$	-	-9.49	-	-	-	-
		(24.65)				
Primary or higher*Political Stability$_{t-1}$	-	4.29***	-	-	-	-
		(1.43)				
Primary or higher*Lack of Political Rights$_{t-1}$	-	0.21	-	-	-	-
		(0.57)				
Secondary or higher*Unemployment$_{t-1}$	-	-	-	-5.71	-	-
				(18.12)		

Secondary or higher*Political Stability$_{t-1}$	-	-	-	4.25**	-	-
				(1.66)		
Secondary or higher*Lack of Political Rights$_{t-1}$	-	-	-	-0.20	-	
				(0.90)		
Tertiary*Unemployment$_{t-1}$	-	-	-	-	-	184.6***
						(56.50)
Tertiary*Political Stability$_{t-1}$	-	-	-	-	-	15.46***
						(4.96)
Tertiary*Lack of Political Rights$_{t-1}$	-	-	-	-	-	0.67
						(1.16)
Obs.	835	835	835	835	835	835
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Countries	62	62	62	62	62	62
AIC	5105	4926.3	5104.4	4959.5	4989.6	4708.6
BIC	5218.5	5054	5217.8	5087.2	5103.1	4836.3
Log Likelihood	-2528.5	-2436.2	-2528.2	-2452.8	-2470.8	-2327.3
Wald	35718.2***	58309.6***	47817***	64435.8***	39352.3***	47562.5***

Standard Errors in parentheses

*** Significant at the 1% level

** Significant at the 5% level

* Significant at the 10% level

Table 5: Effect of Past Killings on Current Killings: Fixed Effects

	Primary or higher (without Interactions)	Primary or higher (with Interactions)	Secondary or higher (without Interactions)	Secondary or higher (with Interactions)	Tertiary (without Interactions)	Tertiary (with Interactions)
Dependent Variable: No. Killed$_t$						
No. Killed$_{t-1}$	0.0007	0.0005	0.0007	0.0007	0.0007	0.0006
	(0.0004)	(0.0005)	(0.0004)	(0.0005)	(0.0004)	(0.0005)
Primary or higher Ed$_{t-1}$	-1.85	9.59**	-	-	-	-
	(2.50)	(3.89)				
Secondary or higher Ed$_{t-1}$	-	-	-2.47	8.26**	-	-
			(2.80)	(4.10)		
Tertiary Ed$_{t-1}$	-	-	-	-	10.91*	29.94***
					(6.26)	(8.79)
Primary or higher*Unemployment$_{t-1}$	-	1.40	-	-	-	-
		(24.54)				
Primary or higher*Political Stability$_{t-1}$	-	6.05***	-	-	-	-
		(2.10)				
Primary or higher*Lack of Political Rights$_{t-1}$	-	-0.79	-	-	-	-
		(0.76)				

Secondary or higher*Unemployment$_{t-1}$	-	-	-	-3.74	-	-
				(20.73)		
Secondary or higher*Political Stability$_{t-1}$	-	-	-	4.64**	-	-
				(2.25)		
Secondary or higher*Lack of Political Rights$_{t-1}$	-	-	-	-1.23	-	-
				(0.82)		
Tertiary*Unemployment$_{t-1}$	-	-	-	-	-	172.6***
						(60.61)
Tertiary*Political Stability$_{t-1}$	-	-	-	-	-	20.24***
						(5.27)
Tertiary*Lack of Political Rights$_{t-1}$	-	-	-	-	-	-0.53
						(1.77)
Obs.	588	588	588	588	588	588
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Countries	44	44	44	44	44	44
AIC	15628.00	14561.90	15596.90	14887.20	15557.50	14458.60
BIC	15737.40	14684.50	15706.30	15009.80	15666.90	14581.10
Log Likelihood	-7789.00	-7253.00	-7773.40	-7415.60	-7753.70	-7201.30
Wald	11417.10***	98685.80***	17478.00***	135061.00***	9574.20***	135569.20***

Standard Errors in parentheses.

*** Significant at the 1% level

** Significant at the 5% level

* Significant at the 10% level

Note: The above regressions also include other independent variables that were included in Table 2.

Table 6: Effect of quality of Human Capital on No. Killed due to Terrorist Attacks (Fixed Effects)

	Overall Score (without interactions)	Overall Score (with interactions)	Secondary Score (without interactions)	Secondary Score (with interactions)	Primary Score (without interactions)	Primary Score (with interactions)
Overall Score	-0.07	-0.21	-	-	-	-
	(0.12)	(0.34)				
Secondary Score	-	-	0.09	0.28	-	-
			(0.31)	(0.44)		
Primary Score	-	-	-	-	0.62***	1.10***
					(0.18)	(0.39)
Overall Score*Unemployment	-	2.80	-	-	-	-
		(2.03)				
Overall Score*Political Stability	-	-0.01	-	-	-	-
		(0.05)				
Overall Score*Lack of Political Rights	-	-0.06*	-	-	-	-
		(0.03)				

Secondary Score*Unemployment	-	-	-	-3.21	-	-
				(2.04)		
Secondary Score*Political Stability	-	-	-	-0.20**	-	-
				(0.08)		
Secondary Score*Lack of Political Rights	-	-	-	0.05	-	-
				(0.14)		
Primary Score*Unemployment	-	-	-	-	-	2.25
						(1.99)
Primary Score*Political Stability	-	-	-	-	-	0.11
						(0.19)
Primary Score*Lack of Political Rights	-	-	-	-	-	-0.12**
						(0.05)
Obs.	239	239	177	177	180	180
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
No. of Countries	20	20	15	15	17	17
AIC	2983.40	2796.60	1505.50	1388.60	1636.20	1557.20
BIC	3049.50	2862.60	1549.90	1433.10	1687.20	1608.30
Log Likelihood	-1472.70	-1379.30	-738.70	-680.30	-802.10	-762.60
Wald	526064.10***	1275061.30***	988748.20***	11590.40***	114217.90***	10770.60***

Standard Errors in parentheses

*** Significant at the 1% level

** Significant at the 5% level

* Significant at the 10% level

Note: The above regressions also included other independent variables that were included in Table 2.

Appendix

Table A.1: Summary Statistics for restricted sample used in fixed effects regressions in Tables 2 and 3

Variable	Obs.	Mean	Std. Dev.	Min	Max
No. Killed	588	44.21	128.37	0	1072
No. of Incidents	588	14.29	43.82	0	540
Primary or higher Ed	588	0.44	0.18	0.08	0.86
Secondary or higher Ed	588	0.27	0.19	0.02	0.85
Tertiary Ed	588	0.07	0.06	0.00	0.26
Overall Score	272	43.29	8.08	19.15	56.48
Secondary Score	205	47.93	6.25	26.42	56.95
Primary Score	202	38.08	7.02	19.15	49.69

Life Expectancy	588	66.49	10.18	36.03	81.64
Political Stability	588	-0.73	0.88	-3.18	1.67
Lack of Political Rights	588	3.82	2.03	1	7
Civil War	588	0.40	0.49	0	1
Military Expenditure	588	0.03	0.02	0.00	0.14
GDP per capita (PPP)	588	9.80	10.77	0.56	48.40
Trade Openness	588	0.67	0.37	0.18	2.20
Unemployment Rate	588	0.09	0.06	0.00	0.36
Population (in 100 m.)	588	1.03	2.50	0.01	13.31

Table A.2: Summary Statistics for restricted sample used in fixed effects regressions in Table 6 that control for overall test scores

Variable	Obs.	Mean	Std. Dev.	Min	Max
No. Killed	239	25.46	74.40	0	634
No. of Incidents	239	10.44	25.50	0	228
Primary or higher Ed	239	0.50	0.16	0.11	0.79
Secondary or higher Ed	239	0.31	0.17	0.02	0.62
Tertiary Ed	239	0.10	0.07	0.00	0.26
Overall Score	239	43.78	7.86	24.09	56.48
Secondary Score	187	48.63	5.28	36.05	56.95
Primary Score	182	38.19	6.83	24.09	49.49
Life Expectancy	239	70.72	10.12	45.75	81.64

Political Stability	239	-0.40	0.93	-2.39	1.67
Lack of Political Rights	239	2.79	1.99	1	7
Civil War	239	0.44	0.50	0	1
Military Expenditure	239	0.02	0.02	0.00	0.09
GDP per capita (PPP)	239	15.91	12.50	0.60	48.40
Trade Openness	239	0.65	0.35	0.22	2.03
Unemployment Rate	239	0.09	0.05	0.01	0.23
Population (in 100 m.)	239	0.72	0.75	0.01	3.07