WOMEN AND TERRORISM: HOW DOES THE TREATMENT OF WOMEN AFFECT RATES OF TERRORISM?

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ABSTRACT

Since the terrorist attacks of September 11, 2001 (9/11) the United States (U.S.) has rededicated itself to ending terrorism worldwide. The Global War on Terror is the military component of a multi-faceted comprehensive counter-terrorism effort. Terrorism has a political cause that must be addressed if the U.S. wants to find a more permanent solution to this deadly problem. As such, a purely military strategy is unlikely to be effective in the long term. Since 9/11, the U.S. government has committed itself to addressing the underlying causes of terrorism as part of a pro-active counter-terrorism strategy. This thesis examines the relationship between gender inequality, and the lack of women’s empowerment in a country, and the amount of terrorism perpetrated by nationals of that country. The expectation was that countries with more inequality and lower levels of women’s empowerment, as measured by labor force participation and fertility rate, would have lower levels of terrorism. The relationship between the treatment of women and terrorism was examined using a multivariate Tobit model that controlled for various demographic, geographic, and political factors. Twenty-seven years (1980-2006) of data on terrorist attacks were analyzed. Contrary to the expectation, the data showed that higher levels of female labor force participation were correlated with higher numbers of casualties from terrorist attacks. Similarly, higher fertility rates were correlated with lower numbers of casualties from terrorist attacks. In both cases, the correlation was statistically, though not practically, significant.
Acknowledgements
Thank you to my parents for their love and support. Thank you to my sister for putting up with me while I was working on this and feeding me real food while I worked. Thank you to Gloria Bader for her interest in my research and in my intellectual development throughout my formative years. Thank you to my fiancé, Manus Patten, for his never-ending patience and genuine interest in my work. Thank you to my advisor for his guidance and help navigating the thesis process. Thank you to my thesis group for listening to me every week and offering their invaluable insights.
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Introduction

After the terrorist attacks of September 11, 2001 (9/11) the United States (U.S.) rededicated itself to ending terrorism worldwide. The Global War on Terror, now called Overseas Contingency Operations (Wilson and Kamen, 2009), is the military component of a multi-faceted comprehensive counter-terrorism effort. It is widely acknowledged that the U.S. military has a role to play in fighting terrorism but it is also understood that the military alone cannot end terrorism. Terrorism, in part, has a political cause that must be addressed if the U.S. wants to find a more permanent solution to this deadly problem.

Reducing or eliminating terrorism by addressing its underlying causes is a pro-active counter-terrorism strategy that was heavily supported by President George W. Bush’s administration after the attacks of September 11, 2001. Both the 2003 and 2006 versions of the National Security Strategy for Combating Terrorism articulate a long-term strategy for fighting terrorism that includes winning the War of Ideas and working to “resolve regional disputes, foster economic, social, and political development, market-based economies, good governance, and the rule of law” (National Strategy for Combating Terrorism, 2003, p. 23). The logic behind this strategy is that if the U.S. can ameliorate the conditions that foster terrorism (for example, poverty, political party repression, lack of citizen political participation, and nondemocratic governance) then the number of people who use violence to achieve political goals will decrease.

For President Bush’s strategy to be successful it must correctly identify the underlying conditions that are associated with terrorism, and then eliminate them. This thesis focused on one of the potential underlying conditions of terrorism: gender inequality, when women are given fewer rights and opportunities than men, and the lack of women’s empowerment, when women have few rights and lack access to education and medical care.
Many U.S. foreign aid and development policies accept as given that gender inequality goes against our national interest. Accordingly, the U.S. funds foreign aid programs that are targeted at women and specifically designed to improve women’s access to education, medical care, and credit. At the same time, there is significant anecdotal evidence that terrorists disproportionately arise from countries where women are not empowered; they lack political rights, are less educated than men, and generally have a lower social status. For example, the September 11, 2001 hijackers were from Saudi Arabia, the United Arab Emirates, Egypt, and Lebanon and in all of these countries, women make up substantially less than 50% of the labor force and have higher fertility rates than the world average. Yet, there is no empirical evidence supporting or even testing this routinely assumed relationship. The purpose of this thesis is to demonstrate, empirically, that a relationship exists between gender inequality and terrorism.

If a relationship between gender inequality and terrorism can be established, the existence of an underlying cause of terrorism would provide the U.S. with another way of attempting to reduce terrorism worldwide. The economic benefits of empowering women, through increased access to education, medical care, and credit, have already been shown (Colman, 2004, Buvinic and Morrison, 2008), and if the hypothesized link between the treatment of women and terrorism can be established then development programs that target women may also benefit U.S. national security. Educating women lowers fertility rates, decreases child mortality, and raises income levels (Coleman, 2004, Buvinic and Morrison, 2008). Similarly, microfinance projects specifically loan money to women because it has been shown that loans given to women have a larger beneficial impact than loans given to men (Coleman, 2004). Establishing the link between women’s status and terrorism through empirical evidence rather than relying on anecdotal evidence, would give the U.S. government a reason to create and fund policies and programs
aimed at eliminating gender equality and empowering women as a part of a holistic strategy to fight terrorism.
Literature review and discussion of policy relevance

The relationship between gender equality and terrorism is undetermined despite a significant body of work that addresses each of these two concepts separately. Researchers have not yet empirically tested the existence of a link between the two. This thesis draws from research on both the causes of terrorism and studies on the role of gender equality in economic development.

Terrorism has a complex set of political, economic, and social causes. Much of the existing work in the field has been focused on discerning the causes of terrorism. The 2003 National Strategy for Combating Terrorism and the 2006 National Security Strategy for Combating Terrorism provided examples of what the Bush administration believed to be the causes of terrorism. During President Bush’s administration, U.S. foreign policy was based on the principles laid out in these two documents. Poverty, lack of education, and illegitimate, undemocratic governments were all offered as conditions that contributed to terrorism. By remedying these conditions, the U.S. sought to achieve greater security from terrorism.

Krueger and Maleckova’s (2003) research demonstrated that poverty reduction and increased availability of education, while laudable for many other reasons, are not likely to decrease the incidence of terrorism. Their findings fly in the face of official U.S. government policy, which explicitly claims that poverty is a cause of terrorism and that economic growth will reduce terrorism. Krueger and Maleckova found that it is not poverty, but perceived lack of opportunity due to official policies, economic inequality, and lack of political rights that causes higher rates of terrorism in poorer countries. Poverty, in and of itself, does not create terrorists or lead to more incidents of terrorism (Krueger and Maleckova, 2003).

Lack of education also was shown not to contribute to higher rates of terrorism. Krueger
and Maleckova’s study of dead Hezbollah fighters found that these terrorists were actually far better educated than the national average. Hezbollah terrorists also tended to be wealthier than the national average, again challenging the accepted wisdom that poverty and lack of education cause people to turn to terrorism. They did find that the larger the number of individuals in a nation that were Muslim, Christian, or Hindu the greater the number of international terrorist events originating from a country. Interestingly, the proportion of Hindus had the greatest effect on the number of terrorist events, while the effect of the proportions of Christians and Muslims was similar and smaller. It appears that having a religious population, regardless of what religion, is related to the number of terrorist incidents (Krueger and Maleckova, 2003).

The absence of a democratic government also was highlighted as a cause of terrorism by both the 2003 and 2006 versions of the National Security Strategy for Combating Terrorism. Yet, most of the empirical evidence supports the idea that democracies encourage transnational terrorism (Li, 2005). Democracies are associated with more incidents of terrorism for two main reasons. First, democracies protect the civil liberties and freedoms of their citizens and residents. These freedoms reduce the costs of forming terrorist groups and communicating in secret. Secondly, democratic governments are highly constrained in the actions they can take to minimize the ability of terrorists to act. The net effect is that democracies experience higher levels of terrorism than non-democracies. (Li, 2005)

Additionally, a democratic government cannot eliminate the rights of entire political, religious, or ethnic groups even if it believes members of these groups are potential terrorists. For example, following the terrorist attacks of September 11, 2001, the U.S. government would not and could not take away the rights of all Muslims or Arabs because 19 men from these demographic groups committed a terrorist act. The rule of law and transparency that is highly
valued in democracies makes it easier for terrorists to organize and plan attacks and makes it harder for the government to stop them. (Li, 2005)

The argument against Li’s research results is that because democracies offer citizens a legitimate means of participating in the political process, they will be less inclined to pursue more costly terrorist activities. Additionally, terrorist attacks are unlikely to be viewed by the general population as legitimate political expressions when non-violent means are available. Since terrorism is not viewed as legitimate in democracies, the local population would appear to be unlikely to support or accept terrorist groups which in turn increases the operating costs of these groups.

Both explanations are rational and well reasoned. Empirically, Li (2005) finds the former to be supported by evidence from past terrorist incidents. Li found that constraints on the government caused democracies to experience higher rates of terrorism. Although initially counter-intuitive, there is strong empirical evidence that democracies do have higher rates of terrorism than authoritarian regimes. Perhaps it is America’s cultural and moral bias towards democratic governments that led the U.S. government to believe that promoting democracy would be the panacea for terrorism. Unfortunately the evidence does not support the promotion of democratic governments as a means of reducing terrorism. (Li, 2005)

Abadie (2006, 2008) built on the research of Li and that of Krueger and Maleckova, and examined other potential causes of terrorism. Having eliminated poverty, lack of education, and lack of democratic governments as potential causes of terrorism, political scientists searched for other potential underlying causes of terrorism. Abadie examined both domestic and international terrorism, using a measure of terrorist risk rather than using past terrorist incidents or measures of terrorist casualties, which most other researchers in the field use. In light of the previous
research, Abadie examined whether the nations that gave citizens more political rights and freedoms experienced higher levels of terrorist risk. He controlled for economic development, geographic variables (country area, elevation, and tropical area), and fractionalization.

Abadie found that countries that lacked political rights had a higher level of terrorist risk than those with more political rights. His research also supports Krueger and Maleckova’s findings that there was no link between income and terrorism; he found that economic development was not correlated to terrorist risk. Interestingly, he did find that all of the geographic variables were statistically significant. Countries that were larger, had a higher average elevation, and a larger percentage of land in the tropics all had higher levels of terrorist risk. Abadie suggested that these physical characteristics all make it harder for a government to crack down on terrorist groups, thus increasing the risk of terrorism. Afghanistan is a perfect example of Abadie’s findings. Afghanistan’s rugged mountain terrain has made it difficult for U.S. armed forces to fight an Islamist insurgency that hides in the mountains and caves that dominate Afghanistan’s large land area (Abadie, 2004 and 2006).

Abadie’s and Li’s findings are not particularly helpful in terms of formulating actionable policies. If the lack of political rights causes an increase in terrorist risk then increasing political rights should reduce the risk of terrorism. This almost directly contradicts Li’s finding that constraints on government actions increases the number of terrorist incidents in a country (Li, 2005). Political rights are essentially what constrain the government. While, the U.S. can try to persuade other countries to increase the political rights of its citizens as a means of reducing terrorism, as Abadie’s findings might suggest, the U.S. cannot force another government to change its internal policies, especially when there is evidence that countries where the government is more constrained have more terrorist incidents on their soil. (Abadie, 2004 and
2006, Li, 2005)

The empirical work of Abadie, Li, and Krueger and Maleckova has shown that the assumptions on which U.S. long-term strategy (National Strategy for Combating Terrorism, 2003, 2006) was based appear to be incorrect and thus do not provide the U.S. government with actionable policy options. The lack of policy options informed by the existing research encourages looking beyond the conventional political science research on terrorism for other potential causes of terrorism. Crenshaw (2000) discusses past literature on the psychological causes of terrorism and finds several gaps that are similar to the gaps found in research on the social and political causes of terrorism. Crenshaw rejects the idea that there is a terrorist profile that will help law enforcement and intelligence agencies to identify individual terrorists before they act or after they have been apprehended. Most psychologists, including Crenshaw, do not believe that there is a common set of characteristics that identify people willing to engage in terrorism. Additionally, because terrorism is generally a group activity, the personality traits of the individual become less important. Yet, terrorists do have one common trait: they are willing to use violence against non-combatants to achieve their political or religious goals.

Bandura (1990) has identified three major psychological mechanisms of moral disengagement that allow a socialized individual to commit acts that are not generally considered acceptable. Moral disengagement has previously been used to explain political and military violence. Bandura applies the same concepts to terrorists, although he points out that terrorists differ significantly from people who engage in political and military violence in that terrorists’ intended targets are not the people that they physically victimize, but rather other members of society who witness the attacks. Casualties from terrorist violence are “incidental to the terrorists’ intended objectives and are used simply as a way to provoke social conditions
designed to further their broader aims” (Bandura, 1990, p 161). Yet, the same moral justification must be made to commit acts of political, military, or terrorist violence. To make violence morally acceptable to the person committing it, “nonviolent options are judged to have been ineffective, and utilitarian justifications portray the suffering caused by violent counterattacks as greatly outweighed by the human suffering inflicted by the foe” (Bandura, 1990, p 162).

Terrorists must not only create a moral justification for their violence, they also must minimize or distort its detrimental effects and devalue their victims (the last two steps create a moral justification; the less perceived harm caused, the easier it is to justify). Theoretically, societies that can more easily justify violence would be more likely to engage in acts of terrorism (Bandura, 1990).

Groups that are readily able to devalue their own members would seem especially likely to devalue others (Caiazza, 2001). If the men in a country do not see or treat women as equals (and therefore are of less value than themselves) it seems reasonable that they would also find it easier to devalue people who have even less in common with them. Despite the lack of research that examines this possibility, U.S. policy implicitly accepts that such a relationship exists. Empowering women as well as supporting gender equality, equal treatment for men and women under the law and by government policies, has been the stated policy of the U.S., United Nations (U.N.), and World Bank for many years. The benefits to national security have been stated as a given, yet they have never been demonstrated.

The benefits to economic development of gender equality and empowering women, however, have long been accepted and proven. Coleman (2004) highlights many of the costs associated with lack of gender equality. For starters, only half the human capital in a country is being used. Coleman also states, without any evidence, that “the U.S. is increasingly embracing
women’s rights, as a way not only to foster democracy, but also to promote development, curb extremism, and fight terrorism” (Coleman, 2004, p. 80). Coleman links women’s rights to lower rates of terrorism because “societies that marginalize women generally count both fewer anti-authoritarian voices in politics and more men who join fanatical religious and political brotherhoods” (Coleman, 2004, p86). Again, the relationship is stated as fact, yet no such research exists.

This thesis examined the relationship between gender equality and terrorism expressly to demonstrate a link between gender inequality and the lack of women’s empowerment and higher rates of terrorism. Gender equality and women’s empowerment are often used interchangeably but are in fact different concepts. Buvicic and Morrison (2008) explain the way the World Bank measures the two concepts and the importance of considering both measures when looking holistically at the status of women in a society. Gender equality is a relative measure: women might compare equally to men in a given trait, such as literacy. Empowerment is an absolute measure that examines variables such as educational achievement, political rights, and access to reproductive health care. The third goal of the World Bank’s Millennium Declaration was “to promote gender equality and empower women.” (www.worldbank.org) The two are related and this thesis included both measures in the analysis of how the status of women (as measured by both gender equality and women’s empowerment) affects the rates of terrorism.

If the link between gender equality, women’s empowerment and terrorism (which is already accepted by the U.S. government) is supported by the evidence, it reinforces the current U.S. policy of promoting women’s rights and directing foreign aid at programs that help women, not only because these programs improve economic development but also for their benefit to national security. If improving the lives of women is shown to reduce terrorism, not only does
the U.S. government have yet another reason to pursue a morally astute policy, it also provides another way to combat terrorism.
**Conceptual model**

Number of casualties per country per year = $\beta_0 + \beta_{\text{political rights}} + \beta_{\text{GDP per Capita}} + \beta_{\text{forest}} + \beta_{\text{tropical}} + \beta_{\text{elevation}} + \beta_{\text{area}} + \beta_{\text{GINI index}} + \beta_{\text{gender equality}} + \beta_{\text{women’s empowerment}} + \epsilon$

The above model will be used to test whether gender equality and women’s empowerment in a given country is related to the number of casualties caused by terrorist attacks perpetrated by nationals of the country. The model includes variables that control for economic, political, and geographic differences in countries. The dependent variable in this model is the number of casualties caused by terrorist acts committed by nationals of a specific country in a given year. Casualties include individuals killed and wounded by terrorist incidents. In a given year, the nationals of most countries will not have caused any casualties or fatalities in terrorist attacks. To avoid having the coefficient estimates skewed towards zero, a Tobit model was used for the analysis. The alternative, using a logit model where nationals of a country either caused casualties or did not, would not capture the differences that exist between a country whose nationals injured one person in an act of terrorism and those of a country whose nationals killed and injured hundreds of people in the same year. A Tobit model captures these subtleties without biasing coefficient estimates towards zero.

Both gender equality and women’s empowerment are variables of interest. Gender equality is a relative measure whereas empowerment is an absolute one (Buvinic and Morrison, 2008). Both must be included to achieve an accurate measure of the status of women in a country. The percentage of women in the labor force and the ratio of young literate females to young literate males are both measures of gender equality. The fertility rate, the total number of births per women, is a measure of women’s empowerment. Fertility rate captures a number of measures of women’s empowerment, including education, rights, access to birth control and
medical care, and cultural expectations. Increases in education, civil rights, and access to contraceptives and medical care reduce the average number of children a woman bears over her lifetime (Buvinic and Morrison, 2008). Conversely, when cultural norms limit the role of women to reproduction and childcare, women tend to bear more children.

In addition to the variables of interest, the model controls for other variables that are thought to have an effect on terrorism. Even though Krueger and Malacova have shown that poverty is not linked to higher rates of terrorism, many political scientists and politicians continue to believe that the relationship exists and for this reason the model controls for income. Geographic factors, such as land area, average elevation, percentage of land area in the geographic tropics, and percentage of land area covered in forest, are important to control because they affect the ease with which terrorist groups can operate in a given country. A large, mountainous country where travel is difficult, such as Afghanistan, provides terrorists with more places to take refuge from law enforcement. Large forests and tropical land also make it more difficult for law enforcement and domestic intelligence agencies to increase the costs of operating for terrorist groups.

Controlling for political rights and economic development is important because these two variables have been shown to have an effect on rates of terrorism in previous studies (Abadie, 2004 and Li, 2005). To accurately measure the effect of gender equality and women’s empowerment on the rates of terrorism, it is essential to separate out the known causes of terrorism.
Data Sources

Data on terrorist attacks, including the number of casualties and the nationalities of the people who committed the attack, come from the ITERATE (Mickolus, E., Todd Sandler, Jean M. Murdock, and Peter A. Fleming. International terrorism: Attributes of terrorist events, 2004) data set. Demographic data on the various countries come from the World Bank HDI dataset (2008 World Development Indicators. dataset, The World Bank). The Political Rights scores used were determined by Freedom House (Freedom in the World 2007, Freedom House). Geographic data come from the World Bank HDI dataset (2008 World Development Indicators. dataset, The World Bank) and the Center for International Development at Harvard University (Geography Data Sets, Research Datasets, Center for International Development at Harvard University).

The ITERATE dataset was compiled beginning in 1968. ITERATE defines 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 Code Book, p 2)

ITERATE data on specific terrorist attacks were derived from publically available news sources such as the Associated Press, the Washington Post, New York Times, as well as broadcast news channels. ITERATE uses both print and electronic media sources to obtain as much information as possible about terrorist attacks. ITERATE also obtains information from the State Department’s Patterns of Global Terrorism reports (Rosendorff and Sandler, 2005).
The countries named in each dataset were slightly different. Only countries that are recognized by the United Nations were used in this thesis. Several countries that had casualties attributed to them in ITERATE are not members of the U.N. These casualties attributed to these countries were assigned to countries that are on the U.N. list. This was required for only six nationalities (see Table 1).

Table 1, Assignment of Casualties to U.N. Member Countries

<table>
<thead>
<tr>
<th>ITERATE Nationality w/casualties</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abu Dhabi</td>
<td>United Arab Emirates</td>
</tr>
<tr>
<td>Chechnya</td>
<td>Russia</td>
</tr>
<tr>
<td>Corsica</td>
<td>France</td>
</tr>
<tr>
<td>Kurdistan</td>
<td>Turkey</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>Taiwan</td>
<td>China</td>
</tr>
</tbody>
</table>

Dependent Variable

This thesis uses information on terrorist incidents between 1980 and 2006. There are many ways to measure terrorism (the number of attacks, the monetary value of the damage done, etc.), this analysis uses casualties, defined as the total number of individuals killed or injured in an attack, as the unit of measure. Number of casualties is an objective measure of the effects of an attack and does not require any assumptions to be made about either the attackers or the impact of the attack.

Independent Variables

The nationality of the perpetrators is essential to analyzing how the characteristics of a country are related to rates of terrorism. In many attacks, the nationality of the perpetrators is not
known. These incidents were not used in this analysis. Only incidents where the nationality of at least one perpetrator is known are included. When there are multiple perpetrators of more than one nationality, the casualties are evenly divided between those nationalities. Information from specific attacks was aggregated to produce a total number of casualties caused by terrorist attacks perpetrated by nationals of a given country in a specific year. This information was then combined with country specific demographic and geographic data.

Both demographic and geographic data used in this thesis was taken from the World Bank HDI Dataset. All three of the variables of interest, female labor force participation, fertility rate, and female literacy ratio, come from the World Bank. Female labor force participation is measured as the percentage of women in the total labor force. In a situation of perfect gender equality, women would make up the same percentage of the workforce as the overall population, or roughly 50%. Similarly, the female literacy ratio measures the number of literate women ages 15-24 relative to the number of literate men of the same age. In many countries, the overall literacy rate is low, so reporting only the percentage of literate women would not give any information about the relative status of women in that country.

Fertility is measured as the total number of children born to a woman in her lifetime. Unlike the measures of female labor force participation and literacy, fertility measures women’s empowerment and is an absolute measure. The more empowered women become, through education, access to medical care and contraceptives, ability to earn an income, and greater social status, the fewer children they appear to choose to have. For example, in the United States in 2007 the average fertility rate was 2.1 births per women whereas in Yemen the average
fertility rate was 5.5 births per women. Decreases in fertility rate indicate an increase in women’s empowerment. (Buvinic and Morrison, 2008, World Bank HDI dataset)

Two aspects of income are included in this analysis; GDP per capita and GINI index. Gross Domestic Product (GDP) is a measure of the total wealth of country. GDP is measured in constant 2000 US dollars (US$) to account for inflation. GDP per capita is the average income if every individual was given an equal share of the country’s GDP. Because countries vary greatly in how evenly distributed wealth is, the GINI index is also included. The GINI index is a measure of how evenly a country’s wealth is distributed. The GINI index is graphically represented by the Lorenz curve (Fig. 1), which maps the cumulative income share against the distribution of the population. Line A represents a situation in which income is equally distributed, while Line B represents greater income inequality. The higher the GINI coefficient the more income inequality is present in a country. (World Bank HDI dataset)

Figure 1, Lorenz Curve
(www.answers.com/topic/lorenz-curve)
The measures of average elevation, percentage of land in the tropics, and land area were from the Center for International Development at Harvard University. Mean elevation is measured in meters above sea level and was calculated using geographic projections from the National Oceanic and Atmospheric Administration. The proportion of the country’s land area within the geographical tropics was calculated from ArcWorld Supplement database (ESRI, 1996a) (Gallup et al.). Data on land area, measured in kilometers\(^2\), and percentage of forest area, were both obtained from the World Bank.

Freedom House scores a country’s Political Rights on a scale from one to seven, where seven is the lowest possible score. The score is based on measures of the electoral process, political pluralism and participation, and functioning of government. For a country to receive the top score a country’s leaders must be elected in free, fair elections in which all adults are enfranchised, all political, ethnic, and religious groups must be able to organize and participate in elections and hold elected office, the government must be relatively free of corruption and operate in a transparent manner, and elected officials must determine government policies. Deviation from this ideal will result in a decreased score. (For a full list of the criteria and the checklist used by Freedom House see Appendix I.) Freedom House scores countries every year to allow for changes in their political systems.
Results

The table below shows the results of three Tobit models. All three of the models include the two variables of interest, fertility rate and female labor force participations, GDP per capita, and political rights. Models 2 and 3 also include several geographic variables that other research found to be statistically significant indicators of terrorism (Abadie, 2004).

Table 2
Tobit Regression Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertility Rate¹</td>
<td>-5.19 (coefficient)</td>
<td>-2.62</td>
<td>-8.95</td>
</tr>
<tr>
<td></td>
<td>2.87*(p-value)</td>
<td>2.89</td>
<td>3.70**</td>
</tr>
<tr>
<td>Female Labor Force Participation²</td>
<td>1.32</td>
<td>0.95</td>
<td>1.81</td>
</tr>
<tr>
<td></td>
<td>0.54**</td>
<td>0.54*</td>
<td>0.65***</td>
</tr>
<tr>
<td>GDP per Capita³</td>
<td>-5.16e-04</td>
<td>-9.841e-04</td>
<td>7.3e-05</td>
</tr>
<tr>
<td></td>
<td>5.65e-04</td>
<td>6.207e-04</td>
<td>6.35e-05</td>
</tr>
<tr>
<td>Political Rights</td>
<td>8.88</td>
<td>8.12</td>
<td>5.45</td>
</tr>
<tr>
<td></td>
<td>2.52***</td>
<td>2.56 ***</td>
<td>2.68**</td>
</tr>
<tr>
<td>Area⁴</td>
<td>-</td>
<td>1.02e-05</td>
<td>9.18e-06</td>
</tr>
<tr>
<td></td>
<td>1.76e-06***</td>
<td>1.82e-06***</td>
<td></td>
</tr>
<tr>
<td>Average Elevation</td>
<td>-</td>
<td>-</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>0.01***</td>
<td></td>
</tr>
<tr>
<td>Tropical Area⁵</td>
<td>-</td>
<td>-</td>
<td>65.21</td>
</tr>
<tr>
<td></td>
<td>-</td>
<td>-</td>
<td>15.58***</td>
</tr>
<tr>
<td>Constant</td>
<td>-279.39</td>
<td>-277.82</td>
<td>-345.86</td>
</tr>
<tr>
<td></td>
<td>34.36***</td>
<td>34.36***</td>
<td>40.64***</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.0096</td>
<td>0.0234</td>
<td>0.0324</td>
</tr>
<tr>
<td>Probability of χ²</td>
<td>0.0001</td>
<td>&gt;0.00001</td>
<td>&gt;0.00001</td>
</tr>
</tbody>
</table>

* p<0.1  
** p<0.05  
***p<0.01

¹ total number of births per woman  
² percentage of the labor force made up by women  
³ measured in constant 2000 US$  
⁴ measured in km²  
⁵ percentage of total land area located in the geographic tropics
All of the models have small pseudo $R^2$s, indicating that they only explain a small amount of the variation in the number of casualties caused by nationals of a given country, and yet all of the models are highly statistically significant. Model 1 has a pseudo $R^2$ of 0.0096, indicating that the model explains less than one percent of the variation in the number of casualties from terrorism. Yet the model is statistically significant at all conventional levels of alpha; the probability of obtaining the $\chi^2$ obtained in Model 1 at random is less than 0.01%. Adding area as an independent variable improves the model and increases the amount of variation explained; model 2 explains 2.34% of variation in the number of casualties caused by nationals of a given country. Despite the small pseudo $R^2$, the model is highly statistically significant; the probability of obtaining the $\chi^2$ of the model by chance is less than 0.001%. Model 3 includes all of the geographic variables and has the highest $R^2$ of all of the models. Model 3 explains 3.24% of variation in the number of casualties from terrorism. Again, despite the small pseudo $R^2$, Model 3 is highly statistically significant; the probability of obtaining the $\chi^2$ obtained in Model 3 by chance is less than 0.001%.

The results of all three models are consistent with the previous research, which also found that terrorism was correlated to political, economic, and geographic variables. In model 3, all of the geographic variables used (area, average elevation, and tropical area) were found to be statistically significant ($p<0.001$). This finding is consistent with the previous research done by Abadie (2004) and Li (2005). In all three models, the correlation between political rights and casualties was statistically significant at the 5% level, which is consistent with what Abadie (2004) found. The lack of a statistically significant correlation between income (GDP per capita) and rates of terrorism found in all three models is consistent with Krueger and Maleckova’s
(2003) research, which found that a perceived lack of economic opportunity, not poverty, increased rates of terrorism.

Both of the variables of interest were found to have a statistically significant association with the number of casualties caused by terrorism. However, the direction of each of the relationships was the opposite of what was predicted. In model 3, the coefficient on the fertility rate was negative, indicating that an increase in the fertility rate was associated with fewer casualties from terrorism. In the same model, the coefficient on female labor force participation was positive, indicating that an increase in the percentage of the labor force made up by women was associated with an increase in the number of casualties caused by terrorism. Neither of these findings is consistent with the hypothesis that increasing women’s empowerment and improving gender equality would reduce rates of terrorism.
Conclusions and Policy Implications

The results of the regression analysis do not support the hypothesis that increasing women’s empowerment and improving gender equality, as measured by fertility rate and participation in the workforce, decrease amounts of terrorism. Although the correlation between fertility rate and casualties from terrorism was negative and statistically significant, the slope coefficient was too small to be of any practical significance. The results indicate that an increase in the fertility rate of one child per woman would only reduce the number of casualties by 0.3 per year. This requires an increase in the fertility rate by 3.3 births per women to reduce casualties by one person per year. Given that fertility rates have a fairly small range, from 1.08 births per women in South Korea in 2005 to 8.7 in Yemen in 1982, an increase of 3.3 births per woman is a very large increase. Fertility rates are declining in virtually every country around the world, in part due to women’s increased education and access to medical care. Increased educational opportunities for girls and increased access to medical care (including contraception) are two of the United Nation’s Millennium goals, both of which would further reduce fertility rates (Buvinic and Morrison, 2008). Given the established benefits of lower fertility rates on economic development (Buvinic and Morrison, 2008; Coleman, 2004), it is unlikely that the United Nations would discontinue its current programs that are likely to further reduce fertility rates.
Table 3,
Interpretation of Tobit Coefficients

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<thead>
<tr>
<th>Variable</th>
<th>Tobit Coefficient</th>
<th>% Non Limit Observations</th>
<th>Slope Coefficient</th>
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<td>Participation**</td>
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* p<0.1  
** p<0.05  
***p<0.01

The positive slope coefficient on labor force participation indicates that an increase in the percentages of the work force made up by women is correlated with an increase in the number of casualties caused by terrorism. Although the correlation is statistically significant, again it is too small to be of any practical significance. The regression results indicate that a 1% increase in the percentage of the labor force made up by women (i.e., an increase from 49% to 50% women) would increase the number of casualties by 6.1%. This would seem like a significant reduction, except that in a given year citizens of over 95% of all countries cause zero casualties from
terrorism. So for a 1% decrease in the percentage of the labor force made up by women, to eliminate one casualty, a country’s citizens would have needed to cause over 16 casualties in a year. In the 27 years included in this analysis, this casualty level happened fewer than 50 times. The reduction in casualties associated with decreases in the percentage of the labor force made up by women is so small that it is unlikely that the U.N. would end its programs that encourage and enable women to work outside the home.

Caveats and limitations

Two of the control variables that were originally included in the conceptual model, forest area and GINI index, were not included in the final regression analysis because the data available for both variables was incomplete. The World Bank does not calculate GINI scores for every country every year. Also, the World Bank does not have statistics on income distribution for many countries whose nationals are responsible for casualties from terrorism (i.e. Cuba, Saudi Arabia, Libya). Previous research models have included GINI as an explanatory variable and found that it had a statistically significant correlation to terrorism. Not including GINI probably reduced the overall explanatory power of these models in this analysis. If more complete information becomes available, including GINI would improve the model.

The World Bank and U.N. do not report the fertility rates for every country every year. Data on fertility rates is reported for almost every year for developed countries: e.g., U.S., Japan, and most European countries. However, data on fertility rates of developing countries, e.g., Haiti, most of South America, Africa, and the Middle East, is only calculated every two or three years. To avoid eliminating observations because of missing data, fertility rates for the off-years were
interpolated by averaging the fertility rates in the year before and after the year that was missing. Fertility rates change slowly because they indicate the lifetime number of births per woman, rather than the number born that year. Even so, using averages rather than exact number reduces the precision of the estimates given by the models.

Originally, the conceptual model included both labor force participation and literacy ratios as measures of gender equality. Unfortunately, the World Bank does not calculate literacy ratios for every country every year or even every decade. Including literacy ratio in the final model would have reduced the number of observations too much. Since, the other measure of gender equality, labor force participation, was in the model it was possible to drop the literacy ratio variable from the model and still test the same theory.

The ITERATE dataset is compiled exclusively from open source data and as such cannot possibly include all terrorist incidents. The level of freedom of the press in each country affects how much information about terrorist attacks is made public. This means that the information on terrorists attacks in countries with greater freedom of the press will be more complete than information collected in countries that more heavily censor the media. Even in countries such as the U.S. where the press is largely unrestricted, the government may not release information on terrorist attacks for national security reasons. Obtaining the most accurate data available on terrorist attacks would require security clearances and access to highly classified government data.

Data on the nationalities of the people who commit terrorist attacks are especially difficult to obtain. In many incidences, the persons committing an attack die in the course of the attack and unless their identities can be confirmed it is impossible to determine their nationality.
Even if the attackers survive and are captured, they may not tell the authorities their real names or nationalities. Many times the perpetrators of a terrorist attack are never caught or identified, making it impossible to determine their nationality. The ITERATE dataset, while imperfect, is often used in analyses related to terrorism because it is one of the few datasets available to researchers who do not have security clearances.

**Directions for Future Research**

The predictions of a negative correlation between female labor force participation and terrorism and of a positive correlation between fertility rate and terrorism were informed by previous research on the causes of terrorism. Yet, the data did not support either of these predictions. Explaining these results requires looking at factors that were not included in the model but could potentially be included in future research.

Terrorists that are successful in causing casualties are generally well educated (Krueger and Maleckova, 2003). The complex planning and training required for successful terrorist attacks require high levels of education. On the national level, higher levels of education are associated with lower fertility rates. The negative correlation between fertility rates and casualties from terrorism could have been caused by omitted variable bias that resulted from not including education in the model. Including education in future research models could help to separate the effects of education from those of fertility rates on rates of terrorism as well as eliminate any other bias that resulted from omitting education from the model.

The positive correlation between women’s labor force participation and terrorism was also the opposite of what was expected based on previous research. When more women are in
the labor force there is greater competition for jobs, which could mean more men are unable to find jobs. Krueger and Maleckova’s research (2003) found that it was the perception of lack of economic opportunity that led to increased terrorism. Given that most terrorist attacks are carried out by men (Caiazza, 2001), an increase in the lack of economic opportunities could lead some of the men displaced in the labor force by women to turn to terrorism. To differentiate between the effects of male unemployment and those of an increase in women in the labor force it would be helpful to include a variable for men’s unemployment rates in future models.

Although the directions of the relationships between fertility rate and labor force participation and rates of terrorism are the opposite of what was predicted by existing research, the results do make sense when taking into account variables that were not used in the model. Further research that includes education and unemployment rates in the model would reveal more fully the relationship between the treatment of women and terrorism. It may also prove helpful in determining why improvements in gender equality and women’s empowerment are beneficial to economic development but not to reducing terrorism.

The assumption that what benefits economic development will also ameliorate other political and social problems may not be true, as was demonstrated here. Some terrorism does have its roots in economic conditions (Krueger and Maleckova, 2003), but it is not a uniquely economic issue. Nor is it a purely a result of lack of political rights, although this is a contributing factor (Abadie, 2004). Similarly, the position and treatment of women in a society is not the only social variable linked to terrorism; it is one of many factors that contribute to the use of violence to achieve political goals. Terrorism is a problem that cuts across many areas of
the social sciences (economics, political science, psychology etc.), and so too should the research that seeks to explain and identify its major causes.
References


Geography Data Sets :: Research Datasets :: CID Data :: Center for International Development at


Appendix A

Freedom House Calculations of Political Freedom

Rating of 1 – Countries and territories that receive a rating of 1 for political rights come closest to ensuring the freedoms embodied in the checklist questions, beginning with free and fair elections. Those who are elected rule, there are competitive parties or other political groupings, and the opposition plays an important role and has actual power. Minority groups have reasonable self-government or can participate in the government through informal consensus.

Rating of 2 – Countries and territories rated 2 in political rights are less free than those rated 1. Such factors as political corruption, violence, political discrimination against minorities, and foreign or military influence on politics may be present and weaken the quality of freedom.

Ratings of 3, 4, 5 – The same conditions that undermine freedom in countries and territories with a rating of 2 may also weaken political rights in those with a rating of 3, 4, or 5. Other damaging elements can include civil war, heavy military involvement in politics, lingering royal power, unfair elections, and one-party dominance. However, states and territories in these categories may still enjoy some elements of political rights, including the freedom to organize quasi-political groups, reasonably free referenda, or other significant means of popular influence on government.

Rating of 6 – Countries and territories with political rights rated 6 have systems ruled by military juntas, one-party dictatorships, religious hierarchies, or autocrats. These regimes may allow only a minimal manifestation of political rights, such as some degree of representation or autonomy for minorities. A few states are traditional monarchies that mitigate their relative lack of political rights through the use of consultation with their subjects, tolerance of political discussion, and acceptance of public petitions.

Rating of 7 – For countries and territories with a rating of 7, political rights are absent or virtually nonexistent as a result of the extremely oppressive nature of the regime or severe oppression in combination with civil war. States and territories in this group may also be marked by extreme violence or warlord rule that dominates political power in the absence of an authoritative, functioning central government.

Political Rights Checklist

A. Electoral Process

1. Is the head of government or other chief national authority elected through free and fair elections?

- Did established and reputable national and/or international election monitoring organizations judge the most recent elections for head of government to be free and fair? (Note: Heads of government chosen through various electoral frameworks, including direct elections for president, indirect elections for prime minister by parliament, and the electoral college system for electing presidents, are covered under this and the following sub-questions. In cases of indirect elections for the head of government, the elections for
the legislature that chose the head of government, as well as the selection process of the
head of government himself, should be taken into consideration.)
• Have there been undue, politically motivated delays in holding the most recent election
for head of government?
• Is the registration of voters and candidates conducted in an accurate, timely, transparent,
and nondiscriminatory manner?
• Can candidates make speeches, hold public meetings, and enjoy media access throughout
the campaign free of intimidation?
• Does voting take place by secret ballot or by equivalent free voting procedure?
• Are voters able to vote for the candidate or party of their choice without undue pressure
or intimidation?
• Is the vote count transparent, and is it reported honestly with the official results made
public? Can election monitors from independent groups and representing
parties/candidates watch the counting of votes to ensure their honesty?
• Is each person’s vote given equivalent weight to those of other voters in order to ensure
equal representation?
• Has a democratically elected head of government who was chosen in the most recent
election subsequently been overthrown in a violent coup? (Note: Although a peaceful,
“velvet coup” may ultimately lead to a positive outcome—particularly if it replaces a
head of government who was not freely and fairly elected—the new leader has not been
freely and fairly elected and cannot be treated as such.)
• In cases where elections for regional, provincial, or state governors and/or other
subnational officials differ significantly in conduct from national elections, does the
conduct of the subnational elections reflect an opening toward improved political rights
in the country, or, alternatively, a worsening of political rights?

2. Are the national legislative representatives elected through free and fair elections?

• Did established and reputable domestic and/or international election monitoring
organizations judge the most recent national legislative elections to be free and fair?
• Have there been undue, politically motivated delays in holding the most recent national
legislative election?
• Is the registration of voters and candidates conducted in an accurate, timely, transparent,
and nondiscriminatory manner?
• Can candidates make speeches, hold public meetings, and enjoy media access throughout
the campaign free of intimidation?
• Does voting take place by secret ballot or by equivalent free voting procedure?
• Are voters able to vote for the candidate or party of their choice without undue pressure
or intimidation?
• Is the vote count transparent, and is it reported honestly with the official results made
public? Can election monitors from independent groups and representing
parties/candidates watch the counting of votes to ensure their honesty?
• Is each person’s vote given equivalent weight to those of other voters in order to ensure
equal representation?
• Have the representatives of a democratically elected national legislature who were chosen
in the most recent election subsequently been overthrown in a violent coup? (Note:
Although a peaceful, “velvet coup” may ultimately lead to a positive outcome—particularly if it replaces a national legislature whose representatives were not freely and fairly elected—members of the new legislature have not been freely and fairly elected and cannot be treated as such.

- In cases where elections for subnational councils/parliaments differ significantly in conduct from national elections, does the conduct of the subnational elections reflect an opening toward improved political rights in the country, or, alternatively, a worsening of political rights?

3. Are the electoral laws and framework fair?

- Is there a clear, detailed, and fair legislative framework for conducting elections? (*Note:* Changes to electoral laws should not be made immediately preceding an election if the ability of voters, candidates, or parties to fulfill their roles in the election is infringed.)
- Are election commissions or other election authorities independent and free from government or other pressure and interference?
- Is the composition of election commissions fair and balanced?
- Do election commissions or other election authorities conduct their work in an effective and competent manner?
- Do adult citizens enjoy universal and equal suffrage? (*Note:* Suffrage can be suspended or withdrawn for reasons of legal incapacity, such as mental incapacity or conviction of a serious criminal offense.)
- Is the drawing of election districts conducted in a fair and nonpartisan manner, as opposed to gerrymandering for personal or partisan advantage?
- Has the selection of a system for choosing legislative representatives (such as proportional versus majoritarian) been manipulated to advance certain political interests or to influence the electoral results?

B. Political Pluralism And Participation

1. Do the people have the right to organize in different political parties or other competitive political groupings of their choice, and is the system open to the rise and fall of these competing parties or groupings?

- Do political parties encounter undue legal or practical obstacles in their efforts to be formed and to operate, including onerous registration requirements, excessively large membership requirements, etc.?
- Do parties face discriminatory or onerous restrictions in holding meetings, rallies, or other peaceful activities?
- Are party members or leaders intimidated, harassed, arrested, imprisoned, or subjected to violent attacks as a result of their peaceful political activities?

2. Is there a significant opposition vote and a realistic possibility for the opposition to increase its support or gain power through elections?
• Are various legal/administrative restrictions selectively applied to opposition parties to prevent them from increasing their support base or successfully competing in elections?
• Are there legitimate opposition forces in positions of authority, such as in the national legislature or in subnational governments?
• Are opposition party members or leaders intimidated, harassed, arrested, imprisoned, or subjected to violent attacks as a result of their peaceful political activities?

3. Are the people’s political choices free from domination by the military, foreign powers, totalitarian parties, religious hierarchies, economic oligarchies, or any other powerful group?

• Do such groups offer bribes to voters and/or political figures in order to influence their political choices?
• Do such groups intimidate, harass, or attack voters and/or political figures in order to influence their political choices?
• Does the military control or enjoy a preponderant influence over government policy and activities, including in countries that nominally are under civilian control?
• Do foreign governments control or enjoy a preponderant influence over government policy and activities by means including the presence of foreign military troops, the use of significant economic threats or sanctions, etc.?

4. Do cultural, ethnic, religious, or other minority groups have full political rights and electoral opportunities?

• Do political parties of various ideological persuasions address issues of specific concern to minority groups?
• Does the government inhibit the participation of minority groups in national or subnational political life through laws and/or practical obstacles?
• Are political parties based on ethnicity, culture, or religion which espouse peaceful, democratic values legally permitted and de facto allowed to operate?

C. Functioning Of Government

1. Do the freely elected head of government and national legislative representatives determine the policies of the government?

• Are the candidates who were elected freely and fairly duly installed in office?
• Do other appointed or non-freely elected state actors interfere with or prevent freely elected representatives from adopting and implementing legislation and making meaningful policy decisions?
• Do non-state actors, including criminal gangs, the military, and foreign governments, interfere with or prevent elected representatives from adopting and implementing legislation and making meaningful policy decisions?

2. Is the government free from pervasive corruption?
• Has the government implemented effective anticorruption laws or programs to prevent, detect, and punish corruption among public officials, including conflict of interest?
• Is the government free from excessive bureaucratic regulations, registration requirements, or other controls that increase opportunities for corruption?
• Are there independent and effective auditing and investigative bodies that function without impediment or political pressure or influence?
• Are allegations of corruption by government officials thoroughly investigated and prosecuted without prejudice, particularly against political opponents?
• Are allegations of corruption given wide and extensive airing in the media?
• Do whistle-blowers, anticorruption activists, investigators, and journalists enjoy legal protections that make them feel secure about reporting cases of bribery and corruption?
• What was the latest Transparency International Corruption Perceptions Index score for this country?

3. Is the government accountable to the electorate between elections, and does it operate with openness and transparency?

• Are civil society groups, interest groups, journalists, and other citizens able to comment on and influence pending policies of legislation?
• Do citizens have the legal right and practical ability to obtain information about government operations and the means to petition government agencies for it?
• Is the budget-making process subject to meaningful legislative review and public scrutiny?
• Does the government publish detailed accounting expenditures in a timely fashion?
• Does the state ensure transparency and effective competition in the awarding of government contracts?
• Are the asset declarations of government officials open to public and media scrutiny and verification?

Additional Discretionary Political Rights Questions:

A. For traditional monarchies that have no parties or electoral process, does the system provide for genuine, meaningful consultation with the people, encourage public discussion of policy choices, and allow the right to petition the ruler?

• Is there a non-elected legislature that advises the monarch on policy issues?
• Are there formal mechanisms for individuals or civic groups to speak with or petition the monarch?
• Does the monarch take petitions from the public under serious consideration?

B. Is the government or occupying power deliberately changing the ethnic composition of a country or territory so as to destroy a culture or tip the political balance in favor of another group?

• Is the government providing economic or other incentives to certain people in order to change the ethnic composition of a region or regions?
• Is the government forcibly moving people in or out of certain areas in order to change the ethnic composition of those regions?
• Is the government arresting, imprisoning, or killing members of certain ethnic groups in order change the ethnic composition of a region or regions?


On December 3, 2009
## Appendix B

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs.</th>
<th>Mean</th>
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* ITERATE data set

** World Bank HDI

*** Center for International Development

**** Freedom House