

Regime Type as a Causal Mechanism for the Global Terrorism Index

POLS 306: Political Science Methods of Inquiry

## **Theory and Hypothesis**

There are many potential factors that cause terrorist incidents to be more frequent in certain countries. My research question is what causes a country to have more or less terrorist incidents than other countries. This research question would have implications for foreign policy and international relations, in that if it was discovered that certain factors played into terrorist incidents, policy would be changed to address such factors.

My hypothesis is that regime type causes countries' scores on the Global Terrorism Index (GTI). The causal mechanism is the independent variable, regime type. It stands to reason that some regime types will tend more toward terror than others. Different regime types will have different domestic makeups and differing levels of leniency which will create specific attitudes toward different types of terrorist incidents. The null hypothesis is that there is no correlation between a country's regime type and its score on the GTI. The unit of analysis I will be using to test the hypothesis is countries. Theoretically, the scope of the population to which my theory would apply is all countries.

The possible confounding variables that I control for are political corruption and the reliability of police services. I control for both of these variables because theoretically, either one could be the causal mechanism for a country's GTI score while making it appear as though regime type was the causal mechanism. For example, more political corruption may indicate authorities who turn a blind eye, and this could open a country up to more terrorism. If political corruption correlated with regime type, this would make the relationship appear to be between regime type and GTI, when really the relationship is between political corruption and GTI. Similarly, a lower level of police reliability would indicate that police are less willing or able to stop incidents. If levels of police reliability correlated with regime type, the relationship may

actually be between police reliability and GTI, but the correlation between reliability of police services and regime type could cause regime type to appear causal. Either variable could also work the other way, skewing the data to look as though there is no causal relationship between regime type and GTI when there is indeed a relationship.

### **Data: Operationalization and Description**

To translate the theory in order to test it, regime type, the main independent variable, was operationalized by categorizing countries as monarchy, military, one party, multi-party, no party, democracy, and other. Other includes minor regime types, including civil war, occupation, theocracy, transitional regime, and multiparty occupied.

The dependent variable, Global Terrorism Index, is data from the Global Terrorism Database (GTD). The GTD contains data on both domestic and international terrorist incidents and includes over 140,000 cases. This data was combined into a composite score by the National Consortium for the Study of Terrorism and Responses to Terrorism.

The independent control variable, political corruption, is a continuous variable. It is an index is an average of the public sector corruption index, the executive corruption index, the indicator for legislative corruption, and the indicator for judicial corruption. The other variable I control for, reliability of police services, is an ordinal variable treated as a continuous variable, scored from 1 to 7 based on the question, “To what extent can police services be relied upon to enforce law and order in your country?”

In translating from the abstract to the concrete, some information was lost. Each variable has missing data; some countries do not have a value for one or more variables. However, there are still at least 150 cases for each variable, out of the 194 cases in the dataset, so my sample size

is still large enough to test. For regime type, several countries with minor regime types were all placed together in a category labeled “other.” These minor types could be very different from each other in how they relate to the dependent variable, so putting them into one category could skew the data. I chose to still use this variable because the countries placed together as other regime types were so few in number that it will not skew the data the way it would if many countries of differing regime types were put into one category. In addition, this only skews the “other” category; it does not skew the additional categories, which I can still test against each other. The GTI only includes terrorist incidents by sub-national actors, meaning that the data does not include acts of state terror. This could skew the index because a state may commit an act of terror and therefore would tend more toward terrorism than the index shows. I chose to use this variable because the definition of terrorism used is so broad that it will include nearly every sub-national incident and will be very accurate.

A few data transformations were made. First, I recoded the regime type variable. It was originally coded with monarchy as 1, military as 2, one party as 3, multi-party as 4, no-party as 9, other as 99, and democracy as 100. I recoded to eliminate the no-party variable because no country in the sample fit into the no-party category. I recoded democracy from 100 to 5, and I recoded other from 99 to 6. For the bivariate t-test, I converted regime type into a dummy variable, comparing military regime types, coded as 1, to all other regime types, coded as 0. Finally, in doing the both the bivariate and multivariate regressions, I recoded to make military regimes the reference category.

The source for my data is the QOG Standard Dataset 2016 cross-sectional study. The sample was drawn from the population of all countries. The sample includes countries that are current members of the United Nations (UN). Also included are past members of the UN as long

as there has not been a significant change to their sovereignty. 194 countries are included in the dataset. The sources from which the data is drawn include Varieties of Democracy (V-Dem) Project, Vision of Humanity, Hadenius and Teorell (2007), and the World Economic Forum.

VARIABLE	MEAN	STANDARD DEVIATION	VARIANCE	NA'S	N	RANGE	MODE
<b>REGIME TYPE</b>	4.2541	1.1634	1.3536	9	194	1-6	5
<b>GLOBAL TERROR INDEX</b>	2.1299	2.3554	5.5479	33	194	0.00 - 9.11	0
<b>POLITICAL CORRUPTION</b>	0.5227	0.2741	0.0752	29	194	0.009760244 - 0.932629645	0.009760244
<b>RELIABILITY OF POLICE SERVICES</b>	4.2478	1.1351	1.2885	46	194	1.970175 - 6.643466	1.970174551

Table 1

Table 1 shows the summary statistics for each variable. For regime type, the mode is 5, which is the code for democracy. This means the most common regime type in the study is democracy. The table shows that the average for the GTI in a range of 0 to 9.11 is 2.1299, so more countries are on the lower end of the index. For political corruption, in a range from nearly 0 to nearly 1, the average is in the middle. Reliability of police services is ranked on a scale of 1 to 7, and the range ended up being 1.9 to 6.6. The average is 4.2, which is in the middle.

The N column in Table 1 shows that 194 cases were observed for each variable, but for regime type, 9 cases are missing. For GTI, 33 cases are missing. For political corruption, 29 cases are missing. Finally, for reliability of police services, 46 cases are missing. While this does seem like many cases are missing, there are still 148 cases for reliability of police services, which is the variable with the most missing cases.

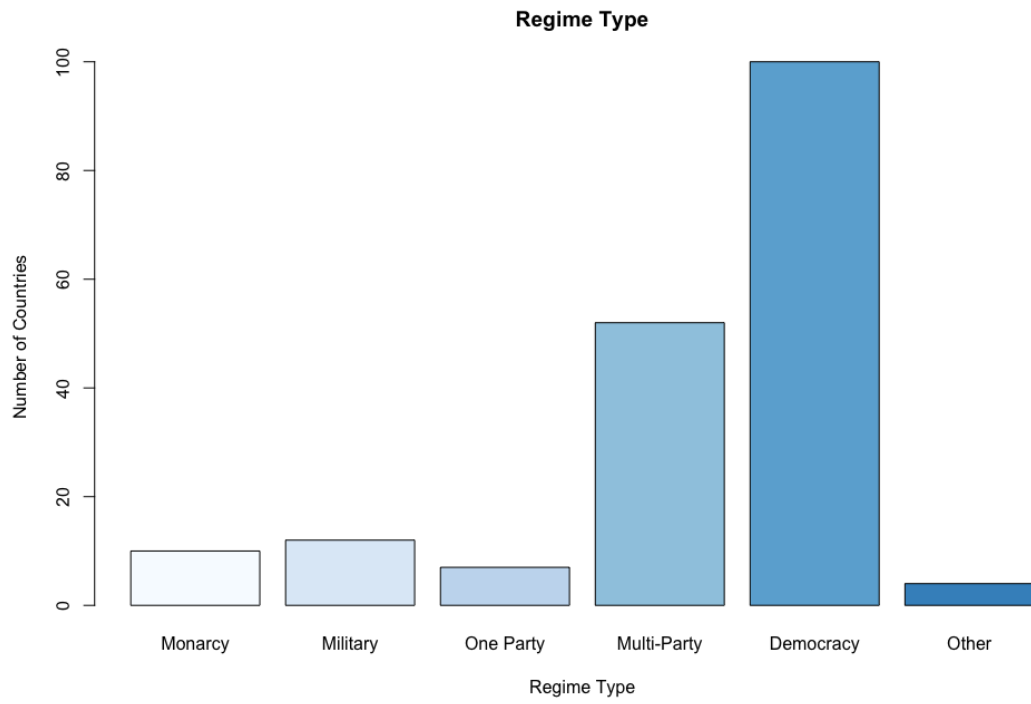


Figure 1

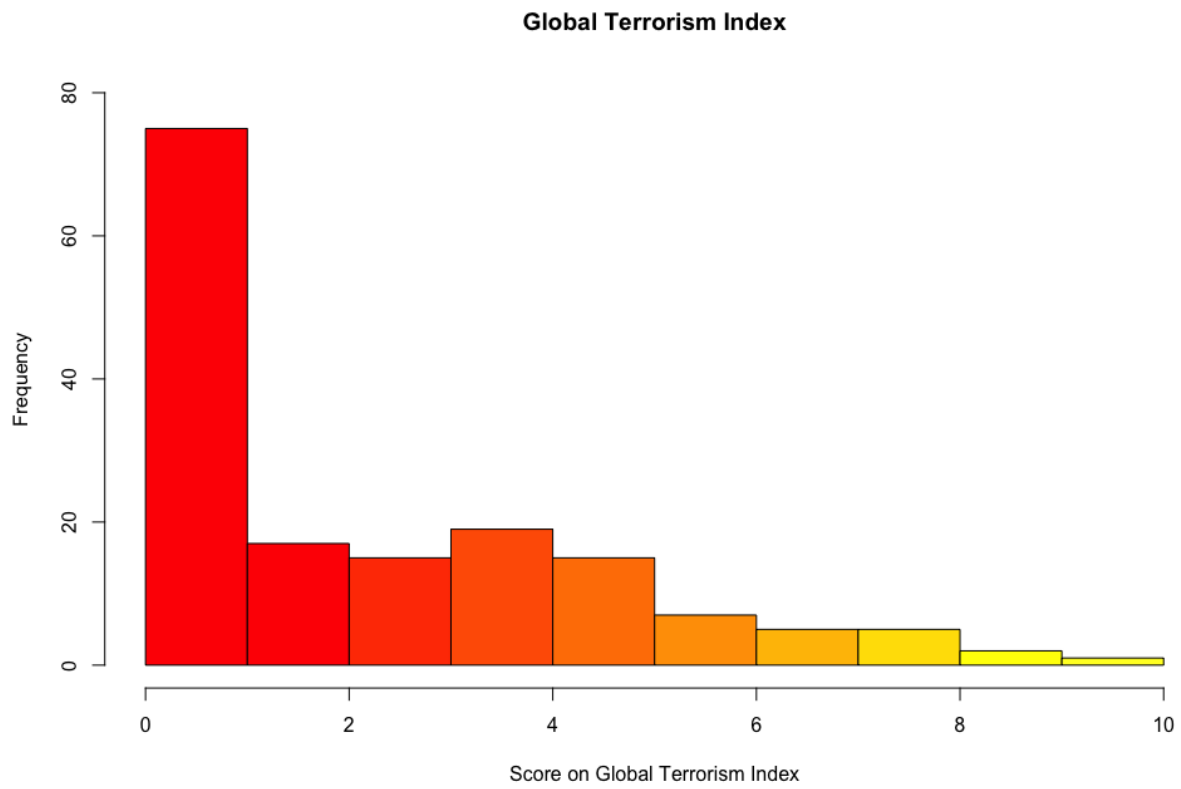


Figure 2

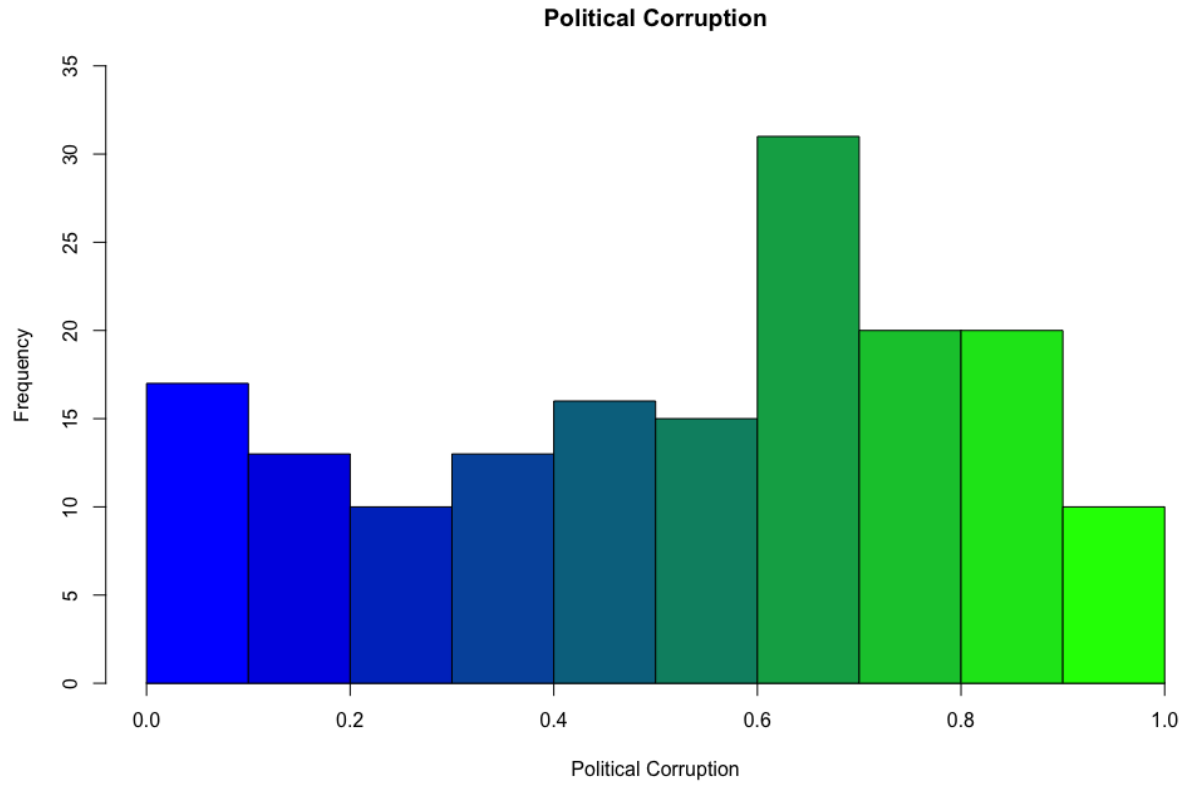


Figure 3

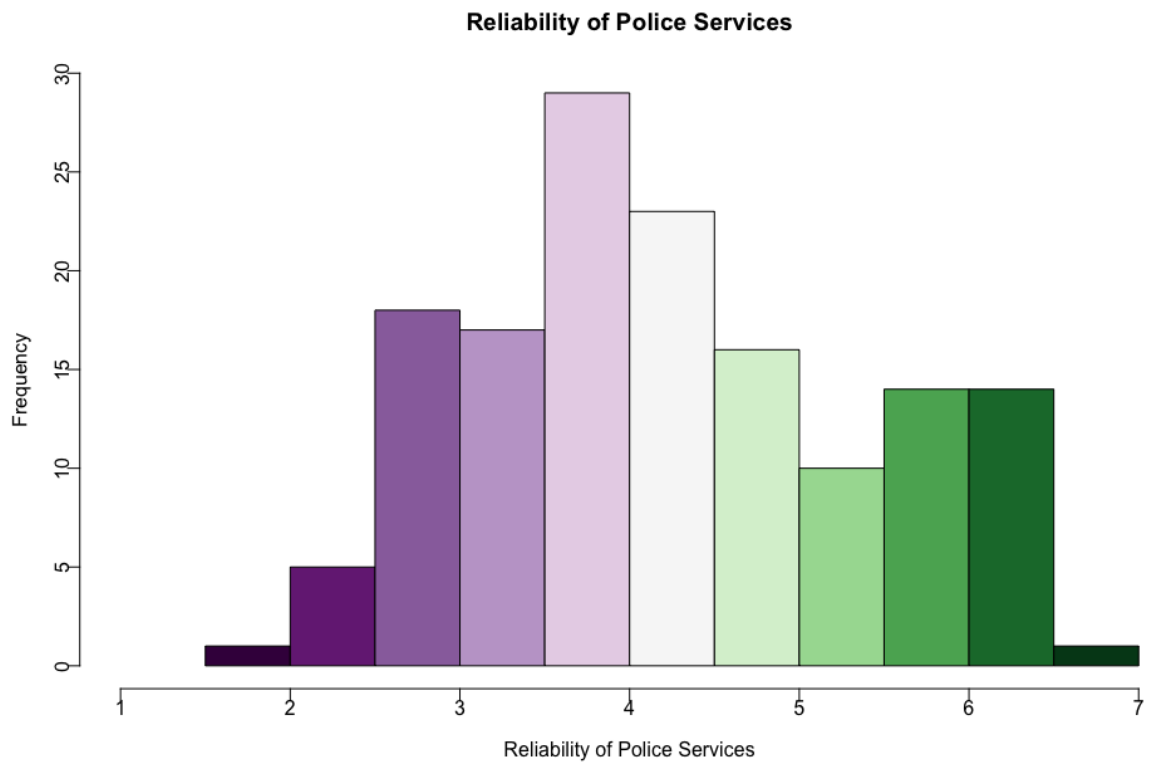


Figure 4

Figure 1 is a bar graph of the categorical variable, regime type. This graph shows that out of the 194 countries surveyed, a considerable amount of countries are democratic regimes. A large number are also multi-party regimes. There are several military regimes and monarchic regimes. Very few countries fall into the other regime category or one party regime category.

Figure 2 is a histogram for the continuous dependent variable, GTI. The graph is extremely skewed and is not even close to a normal distribution. The heaviest distribution is on the left side of the graph, closer to the lower scores on the GTI, indicating that most cases in the sample have very few or no terrorist incidents. The scores then taper off. The cases follow a general trend in which as GTI gets higher, fewer countries have those scores.

Figure 3 is a histogram for the potential confounding variable, political corruption, on a scale of 0 to 1. The graph mostly stays steady the whole way through, with heavy distribution on both ends, meaning that each score of political corruption appears roughly the same amount of times, with a few exceptions, like near 0.2-0.3 and 0.9-1.0, which appear the least frequently, and 0.6-0.7, which appears most frequently.

Figure 4 is a histogram for the potential confounding variable reliability of police services. Out of the three histograms, Figure 4 is closest to a normal distribution, but is still very skewed, but it is less skewed than the histograms for the other variables. The highest frequency is in the middle, but there is not a steady decrease on either side. Many countries appear to have a high police reliability, around 6 points, but even more countries seem to have a lower reliability, of around 3 points. Few countries have scores on either extreme end.



## Bivariate Analysis

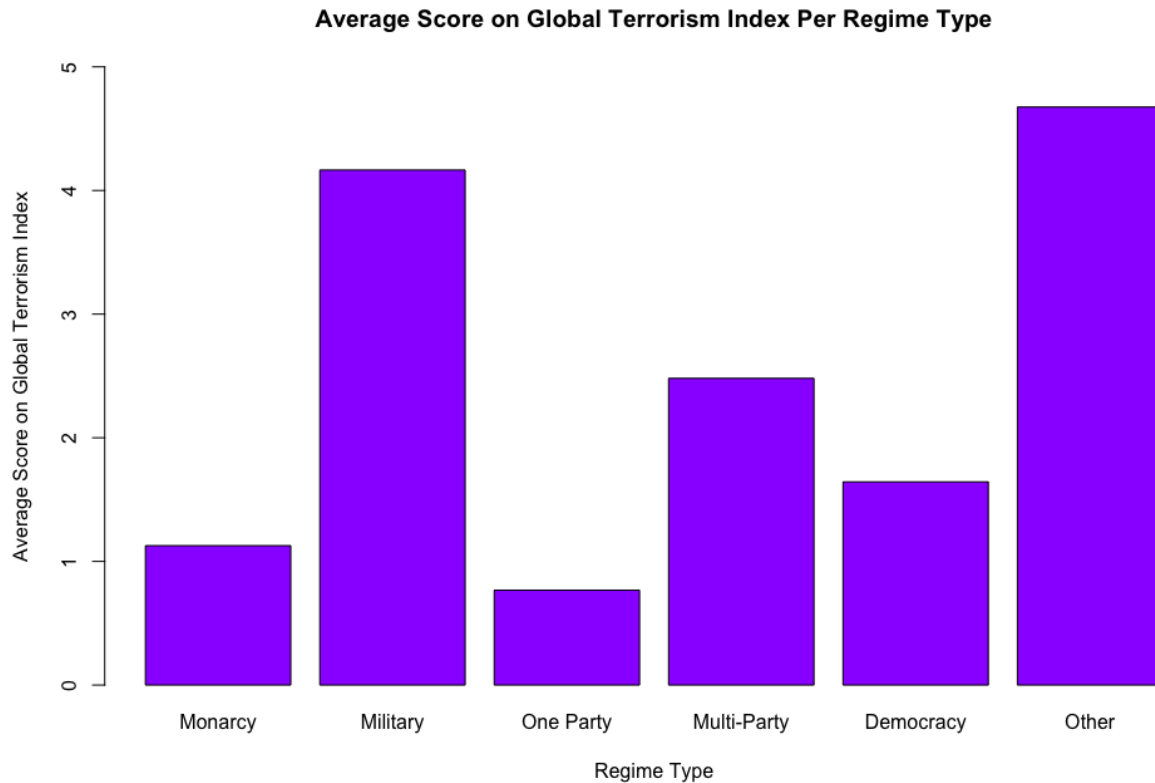


Figure 5

Figure 5 is a bar graph showing the average score on the GTI of each regime category. The graph shows that on average, the other regime category, which includes civil war, theocracy, occupied, multiparty occupied, and transitional regime, has a higher score on the GTI than every other category. This particular category may be inaccurate because it is made of cases of differing regime types grouped into one category. The rest of the categories are likely to be much more accurate, due to ample cases of the same regime type. Military regimes have high average scores on the global terrorism index compared to other categories. The graph suggests that monarchic regimes and one party regimes tend toward terror less than democratic regimes, while

multi-party regimes tend more toward terror than democracies but not as significantly as military regimes and other regimes.

	M1 Estimate (S.E.)
(Intercept)	4.165*** (0.672)
factor(regtype)1	-3.038** (1.035)
factor(regtype)3	-3.398** (1.077)
factor(regtype)4	-1.685* (0.742)
factor(regtype)5	-2.522*** (0.717)
factor(regtype)6	0.510 (1.300)
N	158
RMSE	2.227
R <sup>2</sup>	0.134
adj R <sup>2</sup>	0.106

\* p ≤ 0.05 \*\* p ≤ 0.01 \*\*\* p ≤ 0.001

*Model 1*

The bivariate analysis was done as a preliminary analysis without controlling for potential confounding variables. I used military regimes, coded as 2, as the reference category. This preliminary analysis shows results that hopefully will remain the same after controlling for other variables. According to this analysis, all regime types except other (coded as 6) are significant at the p < .05 level for a two-tailed test. This means, if the control variables have no effect, that I could reject the null hypothesis for the regime types of monarchy, one party, multi-party, and democracy.

I did a difference of means t-test because my main independent variable, regime type, is categorical. I had to create a dummy variable in order to do this, with categories of military and not military. I coded military regimes as 1 and all other regimes (monarchy, one party, multi-party, democracy, other) as 0. There were 163 degrees of freedom, and the critical value of t at  $p < .05$  level was 1.96. My t value was 11.072, which far surpassed the critical value of t at the  $p < .05$  level. Thus, ignoring for the failure to control for confounding variables at this preliminary step, I can say that if many cases were drawn from a population in which there was no relationship between regime type and GTI, less than .001 samples would have shown a difference between their means as large as the one I found in my sample. Thus, I can reject the null hypothesis that there is no relationship between regime type and GTI.

These results are somewhat distorted in that I should have done a F-test but was required to do a t-test. Because I recoded the categorical variable into a dummy variable, with regime type being either military or not military, the results show that the score on the GTI changes when moving from military to not military, as opposed to when moving from military to each specific category. In other words, the t-test shows that regime type matters when it is either military or not military, but does not account for each separate category. The table in Model 1 gives more information than the t-test, because instead of being a table for a dummy variable, it shows each category. Yet, the t-value is so extremely significant that it suggests that the results will not change when the control independent variables are added.

### **Multivariate Regression Analysis**

The multivariate regression was done with control variables to see if they affect the dependent variable or affect the main independent variable's effect on the dependent variable.

The control variables, political corruption and reliability of police services, do not have a statistically significant effect on the dependent variable, GTI, at the  $p < .05$  level for a two-tailed test. This means I cannot conclude that they are causal. They are needed in the model because they affect categories in the regime type variable. They affect relationship between one party regimes (regime type 3) and the dependent variable, as well as the relationship between multi-party regimes (regime type 4) and the dependent variable.

	M1
	Estimate
	(S.E.)
(Intercept)	4.873* (1.947)
factor(regtype)1	-3.838** (1.420)
factor(regtype)3	-3.653* (1.515)
factor(regtype)4	-2.886** (0.927)
factor(regtype)5	-3.395*** (0.962)
factor(regtype)6	-0.346 (1.748)
corruption	0.684 (1.269)
relypolice	-0.013 (0.272)
N	134
RMSE	2.123
R <sup>2</sup>	0.155
adj R <sup>2</sup>	0.108

\*  $p \leq 0.05$  \*\*  $p \leq 0.01$  \*\*\*  $p \leq 0.001$

Model 2

The regression equation is:

$$\hat{Y}_i = 4.873 - 3.8383(\text{monarchy}) - 3.653(\text{one party}) - 2.886(\text{multi-party}) - 3.395(\text{democracy}) - .346(\text{other}) + .684(\text{political corruption}) - 0.013(\text{reliability of police services}) + \hat{u}_i$$

The equation basically shows that there is a change between regime types as well as a change for each control variable. It also shows that the Y-intercept, which is when a regime is military, has a score of 1 for reliability of police services, and a score of 0 for political corruption, is 4.873.

According to figure 5, the average GTI score for military regimes is about 4.5. The Global Terrorism Index range is 0 to 9.11. Model 2 shows the slope coefficients for the independent variables with respect to military regimes and with potential confounding variables controlled for. This is a two-tailed test. With respect to the average GTI score of military regimes, monarchic regimes are 3.838 points lower, one party regimes are 3.653 points lower, multi-party regimes are 2.886 points lower, and democratic regimes are 3.395 points lower. Other regimes are less than half a point lower on the GTI than military regimes. Political corruption affects the dependent variable by 0.684, and reliability of police services affects the dependent variable by -0.013.

According to both Model 1 and Model 2, the main independent variable, regime type, is statistically significant for four categories with military (2) as the reference category: monarchy (1), one party (3), multi-party (4), and democracy (5). It is not statistically significant for other (6). The independent control variables, political corruption and reliability of police services, are not statistically significant. The control variables of political corruption and reliability of police services both had no significant effect on the dependent variable. In comparing Model 1 and Model 2, it can be seen that when the control variables are added in, the effect of one party

regimes on the GTI decrease in significance from the  $p < .01$  level to the  $p < .05$  level, and the effect of multi-party regimes on the GTI increase in significance from the  $p < .05$  level to the  $p < .01$  level.

The  $R^2$  for Model 1 is the fraction of the variance of the GTI variable that is explained by the regime type variable. For Model 2, the  $R^2$  is the fraction of the variance of the GTI variable that is explained by the regime type variable, political corruption variable, and reliability of police services variable. The  $R^2$  in Model 1 is 0.134, and for Model 2, the  $R^2$  is .155. These are not very different, meaning that adding control variables did not meaningfully change how much of the fraction of the variance of the GTI variable was explained.

This analysis showed strong support for my hypothesis for monarchic regimes, military regimes, one party regimes, multi-party regimes, and democratic regimes. I cannot reject the null hypothesis for other regimes.

### **Conclusions**

From my multivariate regression with military regimes as a reference point, I was able to reject the null hypothesis for monarchies, one party regimes, multi-party regimes, and democracies. I was not able to reject the null hypothesis for other regimes. This is likely because of operationalization problems. Other regimes included a wide array of regime types, and each of these regime types were few in number. In other words, few countries fell into each regime type that was included in other, so there was not enough information for an accurate analysis for this particular variable.

The findings are important because they show that multiparty regimes tend toward terror less than military regimes, and democratic regimes, monarchic regimes, and one party regimes all tend toward terror less than both military regimes and multiparty regimes.

There were several other variables I would like to have controlled for, had I not been limited by the constraints of the project, including but not limited to ethnic fractionalization, religion, GDP, and countries' scores on a human rights index. This project tested how regime type affects terrorism on a subnational level; the next step in this research would be to test how regime type affects terrorism on a state level. Future research can build on this by adding more independent variables to test.

Once again, the results showed that I can reject the null hypothesis for five out of the six regime types analyzed. I also found that political corruption and reliability of police services are not statistically significant in causing countries' scores on the GTI. This is important because it shows that regime types do have an effect on the GTI, but the  $R^2$  statistic suggests that there are more factors, so more models need to be run with far more variables.