Terrorism and Corruption: Business Implications of a Nonlinear Relationship

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Several studies have empirically explored the determinants of global terrorism. The general consensus is the repression of individual and political rights is one of the leading causes of terrorist activity. However, as a result of September 11, the focus has also included corruption along with repression as a cause. Is corruption really a cause? No prior research has looked at government and business corruption as influencing global terrorism. In this study, it is concluded that highly corrupt countries and nations with the lowest corruption levels are subject to the greater risk of terrorist activity. These results were obtained by using data from the World Market Research Center-Global Terrorism Index (2004) and the Corruption Perception Index (2004) developed by Transparency International.

GLOBAL TERRORISM

The tragic events of September 11, the bombings in London and Madrid, and the more recent increase in terrorist activities in the Middle East have called upon governments, academics, and world leaders to take a serious look at the causes of terrorist activity and prescribe counter-terrorist policies and strategies to prevent further attacks. President Bush stated, "Poverty does not transform poor people into terrorist and murders. Yet poverty, corruption and repression are a toxic combination in many societies, leading to weak governments that are unable to enforce order or patrol their borders and are vulnerable to terrorist networks and drug cartels" (The New York Times, September 11, 2002). Thus, both corruption and terrorism seem to be emerging as important problems today given the growing concerns surrounding security issues across the world.

In regard to the causes of terrorism, studies have shown political repression and sustained feelings of injustice encourage extremism in the form of terrorism (Krueger and Malečková, 2003; Krueger, 2003; and Windsor, 2003). In addition, the consequences of religious

fundamentalism throughout the world have caused certain perpetrators of terrorist acts to feel their cause is just. It is also reasoned that weak governments plagued by corrupt practices have been unable to cope with the hostility between differing factions resulting in increased terrorist risk. Reiss (2004) points out that years of political and economic corruption often result in resentment, humiliation and a sense of hopelessness that tend to increase the threat of global terrorism. Therefore, corrupt societies should be more prone to terrorist activities. Interestingly, no empirical study has explored the relationship between the corruption and terrorism.

The measure of corruption levels across countries is well defined and recognized broadly across many studies. Briefly, Tanzi (1998) defines corrupt practices as activities that are considered to be illegal, unethical, and dishonest business practices carried out by a bureaucracy, or by political leadership, among others. Transparency International (TI) recognizes that corrupt practices can arise in both the public and private sector and defines corruption as the "misuse of entrusted power for private gain". When viewed in this light, bribery and corrupt practices can be interpreted as a form of repression as not all parties are given equal opportunity and treatment in business or political transactions.

However, the task of measuring terrorism across countries has been challenging since it requires the measurement and assessment of a multitude of factors. Past research (Krueger and Laitin 2003; Frey 2004) examining the determinants of terrorism has largely been dependent on data which measures terrorist casualties or incidents as proxies for terrorist risk. The data used was the MIPT Terrorism knowledge base (2004) which simply counts the number of terrorist incidents, or resulting number of deaths and / or injuries[1]. As Frey (2004) discusses, it is very difficult to "count terrorist incidents". Frey highlights this problem by noting that the terrorist attacks against the World Trade Centers can be counted as one or two terrorist events while taking one person hostage can also be counted as one terrorist event. Frey further notes that other measures of terrorist activity use the number of causalities resulting from the attack. However, there are differences in these data measures as some only consider the number of people killed while others take into account the number of people injured as a result of a terrorist incident. Even the accuracy and adequacy of the U.S. State Department data to measure terrorism has been recently been questioned by Krueger and Laitin (2003) given the ambiguity of the definitions used for the variables in the dataset and the lack of transparency of the process of data collection.

Given the limitations of these data sets, the 2004 World Market Research Center's Global Terrorism Index (WMRC-GTI)[2] seems to be a better proxy for measuring global terrorist risk. The WRMC is an international, independent risk rating agency and defines terrorism as "…the unlawful and premeditated use of violence intended to coerce or intimidate a government or civilian population as a means of advancing a political or ideological cause." This index is the first to include not only cross-national terrorism, but also domestic terrorism across 186 countries and territories. This is important to capture in any study focusing on terrorism, since it is not only the incidence of terrorist acts against a country, but also the possibility of domestically breeding terrorism that needs to be explored.

In its calculation of global terrorist risk, the GTI (2004) incorporates five different sub-indices: (1) *Motivation*, extent to which domestic or transnational groups are currently motivated

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[1] Another popular measure for terrorism is the ITERATE data set (Mickolus (1982) and Mickolus, et al. (1989 and (1993)) but it has its drawbacks as well.

[2] The WMRC website is http://www.worldmarketsanalysis.com/ and was accessed February 1, 2006.

to mount attacks in or against the country; (2) *Presence,* the extent to which the country suffers from a sustained terrorist threat, either from domestic or transnational sources; (3) *Scale*, the ability and desire of terrorist to cause significant casualties and damage*;* (4) *Efficacy*, the known sophistication, capability, and effectiveness of terrorist groups operating within the country; and (5) *Prevention,* the proven intelligence of counter-terrorism capabilities of the country's security services. A weighted average of these five indices[3] is used to calculate a GTI value for each country on a scale of 1 to 100 where higher values of the GTI index indicate a higher presence of terrorism. The WRMC states that countries with low GTI values (between 1 and 25) have a very low or "insignificant" risk of terrorism and countries that have high GTI values (between 85.5 and 100) have an "extreme" risk of terrorism[4]. As an example, some countries with high GTI values are Israel (85.5), Pakistan (84), the United States (81.5), and the Philippines (81).

The primary objective of this study is to empirically explore the relationship between terrorist risk (WRMC-GTI 2004) and corruption (TI-CPI 2004) across a data set of 119 countries, while controlling for factors known to affect terrorist risk such as fractionalization, education, economic development, and geography. To further understand the relationships, the countries are grouped across a terrorism-corruption spectrum to study the possibility of emerging global patterns of terrorism risk. Why is this relevant? If corruption is found to have a significant impact on global terrorism, a country seeking to strengthen its ability to compete in the global marketplace should tailor its strategies accordingly. Further, international investors of capital, political leaders and developers need to understand the underlying reasons why some countries are open to threats of international or global terrorism and why others harbor terrorism because of economic and political corruption breeding resentment.

ROLE OF CORRUPTION

Abadie (2004) defined repression as a lack of political rights and/or civil liberties in his examination of the causal relationship between repression and terrorism. However, repression can be a consequence of many forms such as corruption in business and government transactions which extends beyond the restriction of political and civil rights. As stated by the former U.S. Attorney General, John Ashcroft[5], "…the presence of corruption strengthens terrorist organizations making it easier for them to use illegal funds." Johnston (1996) discusses several forms of corruption ranging from bribery of public officials (Hedienheimer, 1989 and Van Klaveren 1989) to collusion between two parties (Klitgaard 1988). Kehoe (1998) states that corrupt practices such as bribes, kickbacks, and gifts raise the cost of conducting business and Wei (1999) and others[6] find that corruption disrupts trade and investment and distorts public policy. Tanzi (1998) and LaPalombara (1994) find that corruption is widespread in countries with a lack of transparency with respect to operations, processes, and laws. The consensus of the

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[3] The following weights are assigned to the five sub-indices; Motivation (0.40), Presence (0.20), Scale (0.20), Efficacy (0.10), and Prevention (0.10).
[4] The WRMC creates a total of seven risk categories. Countries with GTI values between 1 to 25 have an "insignificant" risk, 25.5 and 35 have a "low" risk, 35.5 to 45 have "low / medium" risk, 45.5 to 55 have "medium" risk, 55.5 to 65 have "medium / high" risk, 65.5 to 85 have "high" risk, and 85.5 to 100 have an "extreme" risk.
[5] David Lieb, "Ashcroft Derides Corruption as 'Sanctuary to the Forces of Terror'," *The Kansas City Star*, 18 February 2004.
[6] Gastanga et. al (1998), Zhao et. al (2003), and Mauro (1995) make similar statements regarding the relationship between corruption and trade, investment, and public policy.

theoretical and empirical studies is that corruption distorts economies and has a negative effect on a country attempting to become a significant player in the global economy.

Given that corruption has global ramifications, many studies have explored why certain individuals, businesses, or countries are more prone to accepting side payments and overlooking corrupt behavior. Often corrupt practices are viewed as an abusive relationship between those with power oppressing those who are seemingly without power. This repressed relationship and frustration as a result of economic and political corruption may lead to increased terrorism risk[7]. It is logical to assume that parties with less information are the ones that must always offer bribes or other forms of payment in order to transact, and therefore tend to become embittered over time and acquire "…feelings of indignity and frustration…". Krueger and Malečková (2003) suggest this sense of helplessness to be one of the root causes of terrorist activity.

Furthermore, corruption tends to weaken governments who are then unable to enforce laws and contain different religious, political, and ethnic factions. Citizens can then become disenchanted and frustrated and resort to terrorist activities. In May 2001, the U.S. Department of State stated in its global anti-corruption report that "…It (corruption) flourishes when democratic institutions are weak, laws are not enforced, political will is lacking, and when citizens are not allowed to be partners in democracy." Thus it is the contention of this paper that,

H$_1$: Highly corrupt countries face a greater risk of terrorism

Is the relationship between global corruption and terrorism simply a linear one as stated in H$_1$? If so, why do countries that are not openly corrupt and are less repressed face high levels of terrorist risk as well[8]? Krueger and Laitin (2003) state that countries that "bask in economic success" are also the ones that are more likely to be a target of terrorist activity[9]. Furthermore, Abadie (2004) reiterates that democratically free countries have increasingly become the victims of transnational terrorism[10] as a result of either grievances against these countries or attempts by terrorist groups from more repressed and corrupt economies to gain international publicity by attacking the free nations.

It is hypothesized in H$_1$ that as countries become less corrupt, they should experience a decline in terrorist risk. However, as these countries continue to become more transparent and have less corrupt power structures, they tend to advance and enjoy international economic success. This economic success can then make these countries targets of transnational terrorism. Therefore, as we have seen in recent terrorist situations across the world, countries that are very corrupt seem to breed terrorism, while those that are least corrupt become terrorist targets. Thus, it is a contention of this study that,

H$_2$: Highly corrupt as well as least corrupt countries face higher terrorist risk.

Before a statistical analysis examining the relationship between the level of corruption and global terrorism, can be performed, other factors affecting global terrorism need to be controlled

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[7] Abadie (2004) and Krueger and Laitin (2003) find evidence that repression causes an increase in terrorist risk.

[8] Examples of such countries are United States, United Kingdom, Spain, and Greece.

[9] Mauro (1995), Mo (2001), Tanzi and Davoodi (1998) have all found empirical evidence that countries with higher levels of corruption experience lower economic growth.

[10] Sandler and Enders (2004) state, "When a terrorist incident in one country involves victims, targets, institutions, governments, or citizens of another country, the terrorism assumes a transnational character."

in order to prevent a model misspecification. It is necessary to control for these variables in an effort to illuminate the true relationship between corruption and terrorism. In section III, each of the control variables (such socio-economic, institutional, geography and fractionalization variables) will be briefly discussed, while a description of the data used is provided in Section IV.

CONTROL VARIABLES

Political Rights and Civil Liberties

Abadie (2004), Krueger and Malečková (2003), and Krueger (2003) find evidence that repression with regard to lack of political rights and / or civil liberties results in an increase in terrorist risk. Krueger (2003) finds that individuals who are unable to practice freedom politically, socially, or with respect to religion are more likely to become involved in terrorist activity. Given the empirical evidence that a lack of democratic freedoms increases terrorist activity, both political rights and civil liberties are controlled for in this analysis.

Geographical Characteristics

Abadie (2004), Glodstein (2005) and others[11] find certain geographical characteristics such as the size of the country, its average elevation, and the proportion of the country in a tropical climate significantly contributes to the terrorist risk.   Geographical characteristics play a role in terrorism as countries that are more difficult to transverse (i.e. those with tropical forests or with mountainous terrain) provide terrorists with secluded training and operational facilities and make it challenging to locate and remove terrorist cells[12]. Further, larger countries tend to lack societal cohesiveness and unity which can alienate minorities and foster disputes (Abadie 2004). Given the empirical evidence that countries with a larger land area, higher average elevation, and a greater proportion of tropical climate are prone to higher levels of global terrorist risk, the geographical characteristics of a country are controlled for in this study.

Economic Development and Freedom

Studies have found little empirical support that the level of economic growth is a significant cause of terrorist activity[13]. As, Windsor (2003) states "…the thesis that poverty causes terrorism has been debunked." However, as previously discussed, countries that are economically successful have more recently become the targets of transnational terrorism. Given that this study considers both domestic and transnational terrorism, a broader definition of economic development and level of institutional freedom needs to be controlled for in order to truly isolate the impact of corruption on terrorism.

Diversity

Past studies have also explored the relationship between ethnic, linguistic, and religious diversity and terrorist activity. Fearon and Laitin (2003) found that, after controlling for per

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[11] Fearon and Laitin (2003) find that countries with larger populations and rough terrain are more likely to experience civil unrest and insurgency.

[12] As an example, Afghanistan has a difficult terrain with higher elevations which has helped terrorist cells evade capture.

[13] Krueger and Laitin (2003), Adabie (2004), Krueger (2003), among others have used narrower measures such as (log) GDP per capita and / or GDP growth rate and found that it is insignificant with regards to terrorist risk.

capita income, the degree to which a country is ethnically or religiously diverse does not significantly impact the degree of civil violence. Further, Abadie (2004) finds the degree to which a country is ethnically and religiously diverse does not impact terrorist risk, but that the more linguistically diverse the country, the greater the terrorist risk. In general, the more diversified the society, the greater the likelihood that there will be significant differences in ideals which can lead to distrust and unrest[14]. Therefore, all three kinds of diversity (ethnic, linguistic, and religious) are controlled for in this analysis.

DATA AND SUMMARY STATISTICS

Corruption
The data used in this analysis to measure corruption is the Corruption Perception Index[15] (CPI Transparency International, 2004). It is the most comprehensive quantitative indicator of cross country corruption available. The CPI is a weighted average of different indexes from 10 different organizations and it reflects the impressions of business people and risk analysts, making it the most comprehensive quantitative indicator of cross-country corruption available[16]. The index assesses the degree to which officials and politicians are believed to accept bribes, or illicit payments in public procurement, embezzle public funds, or commit offences, thus making the measurement of corruption perceptual rather than absolute. The CPI is based on a continuous scale from 1 to 10 [1 = high corruption, 10 = no corruption]. Despite some of its limitations noted by Husted (1999), this index has been used in a number of academic studies.[17] Furthermore, Lancaster and Montinola (1997) conclude that while no index or measure of corruption is perfect, Transparency International's Corruption Index is robust.

Political Rights and Civil Liberties
The data used is the 2004 Political Rights (PR) and Civil Liberties (CL) indices created by Freedom House[18]. In a politically free society, people are allowed to participate freely in the political process[19], compete for public office, and to elect representatives. Further, in societies which permit extensive civil liberties, people have the right to associate and organize the rule of law, the freedom of expression, and personal autonomy without interference from the state. Freedom House assigns ratings separately to political rights and civil liberties on a scale of 1 to 7 with 1 representing the most free and 7 the least[20]. In this analysis, the average of the two indices PR and CL is used for each country such that countries with lower average combined rating of political and civil rights represent higher levels of democratic freedom. This averaged

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[14] Alesina and La Ferrara (2002) find a negative correlation between ethnic diversity and trust.
[15] The CPI is compiled by a team of researchers at Göttingen University, headed by Johann Lambsdorff (2003).
[16] The 10 organizations are: Freedom House (FH); Gallup International (GI); The Economist Intelligence Unit (EIU); Institute of Management Development (IMD); International Working Group (developing the Crime Victim Survey); Political and Economic Risk Consultancy (PERC); Political Risk Service (PRS); The Wall Street Journal - Central European Economic Review (CEER); World Bank and University of Basel (WB/UB); and World Economic Forum (WEF).
[17] Treisman 2000, Davis and Ruhe 2003, and Park 2003 use the CPI in their analyses.
[18] Freedom House (n.d) *Freedom of the World.* Retrieved June 30, 2005 from http://www.freedomhouse.org/research/freeworld/2002/methodology.htm
[19] This includes the right to vote.
[20] Countries with PCR averages of 1 to 2.5 are considered Free, 3 to 5.5 Partly Free, and 5.5 to 7 Not Free.

index (PCR) reflects the level of all democratic freedom guaranteed to citizens within a country[21].

Geographical Characteristics

In this study all four geographical characteristics are considered - country area, elevation, tropical area, and land lock. All of the geographical data were collected from the World Bank[22]. Country area is the size of country measured in square kilometers (in millions), while Elevation represents the average elevation of the county above sea level in meters. Tropical area measures the proportion of the country land area which experiences tropical weather and land lock is a dummy variable that takes the value of 1 if the country is land locked.

Economic Development and Freedom

Past studies have found that economic GDP growth rates and standards of living measured by GDP per capita do not cause terrorist activity. As a result, in this study a more broadly defined measure of economic development is used. The 2003 Human Development Index[23] (HDI) created by the United Nations Development Program is a more comprehensive measure of economic and human development. The index includes not only the standard of living measured by GDP per capita, but also considers longevity defined by a person's life expectancy at birth and education which combines adult literacy rate and the combined gross primary, secondary, and tertiary enrollment ratios[24]. Each country is assigned a HDI score between 0 and 1 which represents the average of all three scores. A higher HDI value represents a greater the level of economic and human development.

Next, the 2004 Index of Economic Freedom (EFI) created by the Heritage Foundation[25] is used to capture distortions across institutional factors such as economic restrictions and barriers within a country[26]. The EFI index considers 50 economic freedom variables which are divided into ten broad categories; trade policy, fiscal burden of government, government intervention in the economy, monetary policy, capital flows and foreign investment, banking and finance, wages and prices, property rights, regulation, and informal market activity. Each of these categories is assigned a score and then these 10 categories are averaged and an overall economic freedom score between one and five is assigned to each country. A score of one denotes an economically free environment, while a score of five signifies a set of policies that is least conducive to economic freedom[27].

Diversity

Three types of diversity are controlled for in this analysis; ethnic (E), linguistic (L), and

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[21] Klitgaard et.al (2005) use the combined average to represent democratic freedom as a proxy.

[22] The data was accessed from the World Bank website on March 18, 2006.

[23] United Nations Development Program. *Human Development Report 2004.* Retrieved June 23, 2005 from http://www.undp.org.in/hdr2004/HDR2004_complt.pdf.

[24] Collier and Hoeffer (2004) state that education tends to affect political attitudes and increases the opportunity cost of political violence. Fearon and Laitin (2003) state that young educated males may be prone to engage in political violence, given a repressed economy.

[25] The Heritage Foundation. *2005 Index of Economic Freedom.* Retrieved July 6, 2005 from http://www.heritage.org/research/features/index/.

[26] Note that the EFI index represents economic freedom, while PCR reflects democratic freedom.

[27] The four broad categories of economic freedom in the Index are: Free—countries with an average overall score of 1.99 or less; Mostly Free—countries with an average overall score of 2.00 to 2.99; Mostly Unfree—countries with an average overall score of 3.00 to 3.99; and Repressed—countries with an average overall score of 4.00 or higher.

religious (R) diversity.   Each of the diversity measures is proxied by the appropriate Fractionalization Index[28] created by Alesina, et al (2003)[29]. Alesina, et al. employ the Herfindahl index methodology to measure each type of fractionalization such that the index represents the probability that two randomly selected individuals from a population belong to different groups. Specifically, the formula used to compute each measure of fractionalization is:

$$FRACT_j = 1 - \sum_{i=1}^{N} s_{ij}^2 \, ,$$

Where s_{ij} is the share of the group i $(i = 1,\dots.N)$ in country j. A value closer to zero would imply a more homogenous society, while a measure closer to one suggests a more fractionalized or heterogeneous society. Thus, the larger the fractionalization index the more diverse is the population. Using this measure, countries in Sub-Saharan Africa show the highest degree of fractionalization in all measures; ethnicity 0.66, linguistic 0.63, and religious diversity 0.50, and the least ethnically fractionalized countries are South Korea and Japan. Countries in western and southern Europe reflected low levels of ethnic diversity (0.18), linguistic diversity (0.20), and religious diversity (0.31) on average[30].

Table 1 provides a summary and descriptive statistics of the variables used in the analysis. The GTI represents 2004-05 data and the data for the control variables is from 2003 and 2004.

TABLE 1
VARIABLE SUMMARY AND DESCRIPTIVE STATISTICS

Variable	Proxy (Name, Year Reported)	Mean	St. Deviation	N
Terrorist Risk	Global Terrorism Index (GTI, 2004)	42.67	19.82	146
Corruption	Corruption Perception Index (CPI, 2004)	4.16	2.23	146
Political Rights & Civil Liberties	Freedom House (PCR, 2004)	3.33	1.91	146
Country Area*	World Bank (CA)	8.91	21.85	137
Average Elevation**	Average elevation above sea level; World Bank (AE)	6.16	5.40	137
Tropical Climate	Proportion of Country Area with Tropical Climate; World Bank (T)	0.44	0.47	138
Land Lock	Indicator Variable taking the value of 1 when the country is landlocked; World Bank (LL)	0.21	0.41	133
Ethnic Diversity	Ethnic Fractionalization Index (E)	0.44	0.25	144
Linguistic	Linguistic Fractionalization Index	0.39	0.28	143

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[28] The Fractionalization Index data is found in Alesina, et al. (2003).
[29] The data was collected from Atlas Narodov Mira, (1964) Levinson (1998), and Minority Rights Group International (1997) for the ethnic classifications, Encyclopedia Britannica (2000) and the CIA world Fact book (2001) for linguistic and religious classifications.
[30] The United States is more ethnically, linguistically, and religiously diverse compared to most European countries. Furthermore, countries with low levels of religious diversity were predominantly Catholic (Italy and Ireland for example), Protestant (Scandinavia for example), and Muslim countries.

Diversity	(L)			
Religious Diversity	Religious Fractionalization Index (R)	0.44	0.23	146
Economic Development	Human Development Index (HDI, 2003)	0.73	0.18	143
Economic Freedom	Economic Freedom Index (EFI, 2004)	2.98	0.71	137

* The mean and standard deviation of country area is reported in km^2 (hundreds of thousands).
** The mean and the standard deviation of the average elevation are reported in meters (hundreds).

Table 2 provides the correlation matrix for all of the variables. Each of the variables was tested for normality using the Jacque-Bera test for normality[31]. At 95% confidence, each of the variables, with the exception of country area was found to be non-normal. As a result, the Spearman rank correlation was used to measure the correlation between all of the variables and these results are presented in Table 2.

TABLE 2
SPEARMAN CORRELATION MATRIX

	GTI†	*CPI*	*PCR*	*CA*	*AE*	*T*	*E*	*L*	*R*	*HDI*	*EFI*
GTI†	1										
N	146										
CPI	-0.26**	1									
N	146										
PCR	0.25**	-0.68**	1								
N	146	146									
CA	0.24**	-0.25**	0.22**	1							
N	137	137	137								
AE	0.22**	-0.27**	0.22*	0.31**	1						
N	137	137	137	135							
T	0.07	-0.37**	0.28**	0.19*	0.07	1					
N	138	138	138	137	136						
E	0.07	-0.44**	0.38**	0.20*	0.15	0.47**	1				
N	144	144	144	136	136	137					
L	0.09	-0.37**	0.27**	0.13	0.12	0.30**	0.69**	1			
N	143	143	143	134	134	135	141				
R	-0.08	0.01	-0.03	-0.07	0.03	0.11	0.25**	0.34**	1		
N	146	146	146	137	137	138	144	143			
HDI	-0.11	0.79**	-0.62**	-0.25**	-0.29**	-0.59**	-0.60**	-0.52**	-0.11	1	
N	143	143	143	134	134	135	141	140	143		
EFI	0.12	-0.83**	0.70**	0.30**	0.17*	0.35**	0.41**	0.26**	-0.05	-0.72**	1
N	137	137	137	132	132	133	136	134	137	135	

† The correlations shown for GTI represent the correlations with the log GTI (LNGTI) as LNGTI is used in the regression analysis. *p <0.05; **p<0.01

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[31] One of the assumptions for the Pearson correlation is that the data is normal. When the data is non-normal, the Pearson correlation is not an appropriate measure and a non-parametric measure of correlation such as the Spearman Rank correlation is necessary.

GTI is negatively and significantly correlated with CPI, indicating that more corrupt countries have a greater risk of terrorism[32]. Further, GTI is significantly and positively correlated with PCR, CA, and AE, suggesting that countries with less political and civil freedoms, greater country size, and higher elevations, have a higher terrorist risk[33]. With regard to the other control variables, the correlation or causal relationship between GTI and T, E, L, R, HDI, and EFI, were found to be insignificant. These correlations suggest existing interrelationships amongst the variables, without establishing any definite causal relationship. In order to explore the directional role of corruption and a global terrorism across countries, a regression analysis is performed.

EMPIRICAL ANALYSIS

In order to examine the hypothesized relationship between terrorist risk and an ordinary least square (OLS) regression analysis was performed. The natural logarithm of GTI (2004) is the dependent variable representing terrorist risk at the country level and the remaining variables serve as explanatory variables. The regression equation is defined as:

$$\ln GTI = \alpha + \beta_1 CPI + \beta_2 CPI^2 + \beta_3 X + \varepsilon$$

where X is a matrix of all the control variables; democratic freedom, diversity, economic freedom and development, country geography, and climate, which were previously discussed. A total of 119 paired observations were available and the results are shown in Table 3.

TABLE 3
REGRESSION RESULTS
Dependent Variable: Natural logarithm of WMRC Global Terrorism Index

	Coefficients	Standard Error	t Stat
Intercept	4.4101	0.6866	6.42**
CPI	-0.3463	0.1195	-2.90**
CPI²	0.0241	0.0097	2.48*
Political Rights & Civil Liberties (PCR)	0.0738	0.0331	2.23*
Country Area(CA)	3.448E-8	1.767E-8	1.95
Average Elevation (AE)	0.0003	0.0001	3.35**
Tropical climate (T)	0.1923	0.1217	1.58
Land Lock (LL)	-0.3664	0.1079	-3.39**
Ethnicity (E)	-0.3410	0.2557	-1.33
Linguistic diversity(L)	0.5689	0.2174	2.62*
Religious diversity(R)	-0.3593	0.1872	-1.92
Human development index (HDI)	1.0398	0.4462	2.33*
Economic freedom index (EFI)	-0.3116	0.1266	-2.46**

*p <0.05; **p<0.01
Adj. R^2 = 0.24   F stat = 4.12**

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[32] Higher values of the CPI indicate lower levels of corruption.
[33] Higher PCR values indicate lower levels of political and civil liberties.

The significance levels of the coefficients, Adjusted R^2, and the F statistic indicate that the regression model provided a good fit to the data. In an effort to validate the results presented in Table 3, tests for both heteroscedasticity and multicollinearity were performed. White's (1980) general test for heteroscedasticity provided evidence that the residuals were homoscedastic. The Variance Inflation Factor (VIF) for each of the explanatory variables was calculated in the regression analysis. With the exception of CPI and CPI^2 none of the VIFs were greater than five[34]. Given that the regression results were supported by these tests, an interpretation of the coefficients and tests of the research hypotheses can now be considered.

As shown in Table 3, the coefficient on CPI is negative and significant. Given that higher CPI values indicate lower corruption levels, the coefficient on CPI suggests that more corrupt countries have a greater risk of terrorism, supporting H_1. Further, the nonlinearity of the relationship is reflected by the coefficient on CPI^2 which is positive and significant. This implies that as countries experience a shift in their corruption levels and become increasingly less corrupt, their risk of transnational terrorism increases, thus supporting H_2. However, countries in the intermediate range of corruption experience the lowest level of terrorism or terrorist threat. As hypothesized, these results suggest that the fundamental relationship between terrorism and corruption is not monotonic. A more in depth discussion of this relationship is presented in Section VI.

Regarding the control variables, the coefficient on PCR is positive and significant suggesting that countries with the least political and civil freedoms experience a higher risk of terrorism. The coefficient on AE is positive and significant, meaning that countries with higher average elevations have a higher terrorist risk, all else equal. The coefficient on LL is negative and significant, indicating that countries that are land locked have a lower terrorist risk and the coefficient on L is positive and significant, suggesting that countries that are more linguistically diverse have a greater risk of terrorism[35]. All these findings are consistent with existing literature. Further, in this analysis, the coefficients on HDI and EFI are found to be significant indicating that the level of human development and economic freedom does affect global terrorism. The positive coefficient on HDI suggests that countries with higher levels of human development face greater terrorist risk, while the negative coefficient on EFI indicates that countries that are more open with higher levels of economic freedom face a higher threat of terrorist risk. These results are consistent with Krueger and Laitin's (2003) empirical evidence that countries that are more economically successful have a greater risk of being a target of transnational terrorism and Testas (2004) findings that countries with higher education levels give rise to more transnational terrorism. The other control variables were found to be statistically insignificant.

The most interesting result in this analysis is the existence of a nonlinear relationship between corruption levels and terrorism across countries even after controlling for socio-economic, institutional, and democratic freedom. The analysis is extended further and a more in depth discussion is presented in Section VI.

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[34] The VIF determines the effects of the correlations among the independent variables and their influence on the variances of the regression coefficients (Maddala 1988, Kennedy 1992). Studenmund (1992), Kennedy (1992), Burns and Bush (2003) suggest a cutoff of 10 and Hair, Anderson, Tatham, and Black (1992) suggest a stricter cutoff of 5.3 so any values less than that suggest the lack of multicollinearity. Using quadratic terms is always associated with multicollinearity and thus higher VIF values for CPI and CPI^2 is not surprising.

[35] Note that Alesina et. al's (2003) data set regarding linguistic diversity masks some of the ethnic and cultural diversity present across countries where people of different cultures and ethnic groups speak different languages.

ANALYSIS OF NONLINEAR RELATIONSHIP

In order to better understand the relationship between terrorist risk and corruption, Figure 1 provides a graphical representation of the nonlinear relationship by showing the estimated value of the ln GTI against the values of CPI included in the data set. In the estimation of ln GTI, all of the variables are evaluated at their means with the exception of CPI. Given that lower values of CPI indicate greater levels of corruption, Figure 1 illustrates that the estimated terrorist risk is greatest when corruption is greatest, holding all other variables constant. However, as countries reach the lowest levels of corruption, the estimated terrorist risk slightly increases. Thus, one of the most interesting and significant contributions of this study is that even after controlling for economic development and democratic and economic freedom, corruption is found to have a significant nonlinear effect on terrorist risk

FIGURE 1
TERRORISM RISK AND CORRUPTION
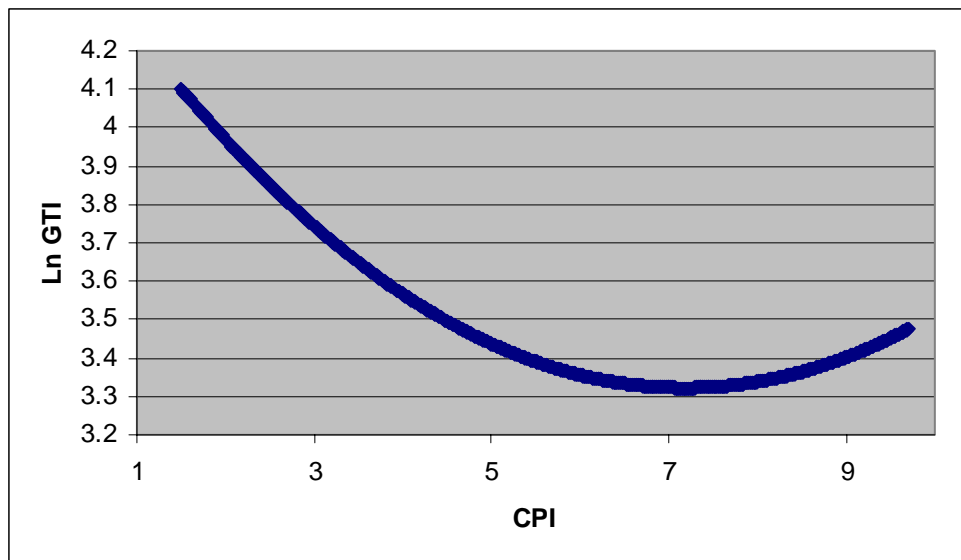
Specifically, as illustrated in Figure 1, countries with CPI values greater than approximately 7.1 experience a slight increase in terrorist risk while those with CPI values of less than 7.1 show a decline in terrorist risk as they transition to becoming less corrupt. Note that the minimum of the estimated regression equation (7.1) is found by taking the first derivative of the estimated regression equation with respect to CPI and solving the first order condition. As argued by Krueger and Laitin (2003) and Abadie (2004), as countries develop socially and economically they tend to become less repressed and corrupt, but in turn become terrorist targets due to grievances against these countries and / or attempts by terrorist groups from corrupt and repressed economies in order to gain international publicity.

In order to put these results in real terms, a breakdown of the countries in this data set with CPI values greater than 7.1 (least corrupt) and less than 2.2 (most corrupt) are grouped as shown in Table 4. The countries with CPI values of 7.1 or greater were selected as they were captured at the turning point of the terrorist risk estimated regression equation and countries with CPI values of 2.2 or less were selected as their CPI ranking was found to be more than one standard deviation above the mean ranking.

TABLE 4
TERRORISM-CORRUPTION SPECTRUM

Group 1: (CPI > 7.1) Countries with Lowest Corruption Levels	Group 2: (CPI < 2.2) Countries with Highest Corruption Levels
France	Bangladesh
Spain	Nigeria
Chile	Chad
Belgium	Myanmar
Ireland	Azerbaijan
United States	Paraguay
Germany	Georgia
Austria	Indonesia
Canada	Tajikistan
United Kingdom	Turkmenistan
Netherlands	Cameroon
Australia	Kenya
Norway	Pakistan
Switzerland	Bolivia
Sweden	Guatemala
Denmark	Kazakhstan
New Zealand	Kyrgyzstan
Finland	Niger
	Ukraine

These groups appear to have some classical differences. The countries in Group 1 are classified as "high" income countries by the World Bank with the exception of Chile[36]. All of the countries in Group 2 belong to the "low" or "lower-middle" income countries. Furthermore countries in Group 1 all have a PCR value of 1 meaning that these countries experience the highest levels of political and civil liberties. In comparison, the countries in Group 2 have an average PCR value of 4.7 indicating that they are among some of the repressed economies in terms of political and civil liberties[37].

The country groupings highlight a possible pattern in the type of terrorist risk these countries face. As Krueger and Laitin (2003) discuss, there are countries in which terrorism originates and there are the countries which are the targets of terrorism. The countries in which terrorism originates are most likely to experience internal or domestic terrorism as a result of low political and civil freedoms. The countries with a greater risk of transnational terrorism are the targets due to grievances against these countries or attempts by terrorists to gain international publicity. When comparing the two groups presented in Table 4, it is apparent that those countries in Group 1 are more likely to be targets of terrorists than experience domestic terrorism while countries in Group 2 are more likely to experience domestic terrorism than transnational terrorism. Thus, a country's level of corruption not only significantly impacts a country's

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[36] Chile is an "Upper-Middle Income" country according to the WB definition.
[37] Note in general countries like Japan, Portugal, and Uruguay experience lower levels of terrorist risk and are in the bottom of the U-shaped terrorism corruption spectrum. These are countries that have lowered their corruption levels and at the same time face low terrorist risk.

terrorist risk, but it also appears to help explain the type of terrorism the country is likely to experience[38].

In order to understand the nonlinearity further, it is important to analyze the GTI measure in more depth. The GTI captures both transnational and domestic terrorist activity in two of its subcomponents; (1) *Motivation* and (2) *Presence*[39]. As previously discussed, GTI is a composite of five different indices and the *Motivation* index measures the extent to which terrorist groups are currently motivated to mount attacks against the country. Many of the countries in Group 1 have a high motivation scores compared to Group 2. For example, the U.S. and the U.K. have motivation scores of 10 and 9 respectively, while countries such as Niger and the Ukraine both have a motivation score of 2 and Paraguay has a score of 3. This suggests that transnational terrorists have a greater motivation to attack the countries in Group 1 compared to those countries in Group 2. In other words, these results suggest that the countries in Group 1 with the lowest levels of corruption are likely to experience an increase in transnational terrorist risk.

Further, the *Presence* index measures the extent to which a country experiences sustained terrorist threats. Although this sustained threat or sustained terrorist attacks can be domestic or transnational terrorism, historically transnational terrorism is not sustained whereas domestic terrorism can be. For example, the transnational attacks against the U.S. on September 11 have not been a recurring series of attacks whereas the people of Sudan, Israel, and Palestine have suffered years of sustained domestic terrorism. In this sense, the presence index provides an indication of the degree to which countries experience domestic versus transnational terrorism. Thus, countries with high presence index values are more likely to experience domestic terrorism than countries with lower presence index values. For example, the Group 2 countries, Tajikistan and Indonesia have presence values of 9 and 8.5, respectively and Georgia, Kenya, and Kyrgyzstan all have a presence score of 8. In contrast, countries in Group 1 such as Finland and Switzerland both have a presence score of 1.5, and New Zealand, Austria, and Norway each have a presence score of 2. This suggests that the countries in Group 2 tend to experience or face a greater presence or risk of domestic terrorism, whereas the countries in Group 1 tend to face a lower presence of domestic terrorist risk.

Thus, a country's level of corruption not only significantly impacts a country's terrorist risk, but it also appears to highlight the type of terrorism the country is likely to experience. An important implication of this result is that simply lowering corruption does not seem to be the only answer to lowering global terrorism. As corruption levels are reduced policy makers need to be mindful that the motivation to attack can increase. Foreign policies need to be established in order to minimize the *motivation* for attack. Policy makers and politicians also need to focus on the reasons behind the *presence* of domestic terrorism. A universal approach to tackling corruption and thus terrorism cannot be adopted, since both these threats are linked but multifaceted in nature.

CONCLUSION

This analysis considers the role of corruption in determining a country's risk of terrorist

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[38] Note in general countries like Japan, Portugal and Uruguay experience lowest levels of terrorism and are in the bottom of the U-shaped terrorism corruption spectrum. These are countries that have lowered their corruption levels and at the same time face low terrorist risk.

[39] The motivation and presence index ranges from 1 to 10 with 10 representing the greatest motivation for attack or presence of domestic terrorism with 1 being the least in both cases.

attack while controlling for several variables known to affect terrorist risk. The major empirical finding in this analysis is that a country's level of corruption has a significant and nonlinear impact on its terrorist risk. Specifically, this analysis finds that countries with the highest levels of corruption have the greater risk of terrorism as corruption can generate feelings of repression in the disadvantaged parties. Further, as President Bush notes, highly corrupt governments are generally weak and unable to patrol borders and enforce order making them more susceptible to terrorist attacks. This study also finds that countries with the lowest levels of corruption experience increases in terrorist risk. The theoretical support for this finding is that countries with the lowest levels of corruption tend to become targets of transnational terrorism because they are freer and wealthier attracting the attention of those living in more repressed and corrupt societies. The nonlinear relationship illuminates the two kinds of terrorist risk countries face; (1) domestic terrorism or higher presence, and (2) transnational terrorism or higher motivation.

The main result of this research is significant and suggests the need for future research in this area. First, as the global terrorism index or other proxy measures for terrorism become available for more countries; future research can test the robustness of these results with a larger cross-sectional data set across different proxy measures. Secondly, as a measure of terrorism becomes available over time, it may be possible to explore the role of corruption on the rate of change of terrorism levels. In other words, given a country's existing socio-economic, democratic and economic makeup, how does corruption impact the terrorism over time? In addition, the possibility of reverse causality can be tested using a Grangers' causality test as it is conceivable that terrorist risk drives the corruption. Countries with high levels of terrorism could enhance the level of corrupt practices and there may be differences between countries breeding domestic terrorism and those who are targets of transnational terrorism.

Thus, it is clear that using a unilateral approach to lowering corruption does not seem to be the answer to lowering global terrorism. However, as a result of this study and others, it appears that one of the keys to reducing global terrorism is the ability for people to express themselves democratically and freely in both political and business arenas. Furthermore, as corruption levels are reduced, policy makers need to be mindful that the motivation to attack can increase and foreign policies need to be created in order to decrease such motives.

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