

## Violent Non-State Actors in the Middle Eastern Region

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### Abstract

The existing body of quantitative research concerning violent non-state actors is sparse at best. It is characterized by disparate definitions of non-state actor violence, and largely fails to discriminate between insurgency, civil war onsets, and terrorism. It also has conflicting theories and conclusions. Meanwhile, defining legitimacy in Arab governments and its affect on non-state actor violence is also problematic. In this paper I look strictly at non-state actor violence perpetrated by actors originating from Middle Eastern States. I use four separate data sources, including the ITERATE, RPC, World Development Indicators, and Witches Brew Homogeneity datasets to relate such factors as RPC, GDP, National Power, levels of instability, and societal homogeneity to examine the notion of opportunity and cause as factors in the advent of non-state violent actors. I find some support among this data for the notion that correlation exists between legitimacy of governance, societal homogeneity, perceptions of wealth inequality and legitimacy, and number non-state actor terror attacks.

### Introduction

Some say that since the fall of the Berlin Wall the international stage has become substantially more complex. September 11, 2001 crystallized the perception that non-state actors are making a significant impact on the international system, particularly those from Middle Eastern countries. This perception has grown into roots of national policy as the ramification of proliferation of weapons of mass destruction sets in. Because violent non-state actors (VNSA) are now a focus of national policy, it has become imperative to develop a body of knowledge that describes the circumstances of non-state actor violence, where and under what conditions it is likely to incubate, and what policy levers may exist for influencing and dampening their effects on the international system.

The 2004 Quadrennial Defense Review cites four key priorities as the current focus for the US military:

- 1) Defeating terrorist networks

- 2) Defending the homeland in depth
- 3) Shaping the choices of countries at strategic crossroads
- 4) Preventing hostile states and non-state actors from acquiring or using WMD.<sup>1</sup>

These four priorities exemplify the policy commitment to viewing individual non-state actors as a matter of foreign policy. This paper examines two general notions: that in order for a violent non-state actor (VNSA) group to arise, it must have (1) opportunity and (2) cause. Opportunity primarily deals with economic and political aspects such as strength of governance and economic opportunity. Cause looks for reasons a VNSA group should wish to operate, and includes perceptions of government illegitimacy and unequal resource distribution.

If it can be shown that such factors as political legitimacy and weakness of governance can influence the advent and levels of violence of VNSA groups, then perhaps better policy decisions can be made in the future as to how to minimize them.

## **I. Literature Review**

The literature on Violent Non-State Actors is sparse, conflates definitions of non-state actors, and is often contradictory in its findings. Writings that specifically delineate between insurgencies and revolutionaries, civil wars and fourth generation war fighters are few. Because the literature on transnational non-state actors is so sparse, I look at findings from related papers to develop a theory of non-state violent actors within the Middle East in which I attempt to identify two specific concepts: opportunity and cause.

Trying to delineate between these two concepts within the literature is challenging. According to H. John Poole (2004), many Muslim nations “have a growing number of young men who consider it their duty to expel foreign invaders from any Islamic country.”<sup>2</sup> Meanwhile, Hudson (1977) tells us that Arab societies are in a condition of rapid socioeconomic development, and saddled with the inequalities of income and opportunity such rapid development brings.<sup>3</sup> These two notions are in opposition with respect to cause if the condition of legitimacy of governance is to be considered in the advent of terror violence. In this context, opportunity relates to the idea that conditions permit violent activity, i.e. low levels of governance capacity, while cause attempts to get at the notion that such actors have a reason for wanting to alter the national or international system, i.e. legitimacy of governance.

In looking at literature specifically related to civil wars we find some support for the notion that political capacity of a government is significant in determining opportunity. Benson and Kugler (1998) successfully use a measure called RPE (Relative Political Extraction) to show that insurgencies escalate levels of violence within a country when they have some level of parity with the official government. They attempt to compare the RPE of an existing government to the RPEO (Opposition) of an opposing political movement within a

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<sup>1</sup> Department of Defense, Quadrennial Defense Review, Page 3, February 6, 2006

<sup>2</sup> Poole, H. John, *Tactics of the Crescent Moon*, 2004.

<sup>3</sup> Hudson, Michael C., *Arab Politics, the Search for Legitimacy*, 1977

country. The logic is that a political movement will not resort to violence unless it believes it has a chance of success in accomplishing its goals. Although this finding does not relate specifically to VNSA, it shows the strong relevance of political capacity measures in predicting non-state actor violence.

Fearon and Laitin (2002) posit, however, that non-state actor violence (insurgency primarily) stems from the accumulation of protracted conflicts.<sup>4</sup> They define countries at risk for civil war as having high levels of poverty and bureaucratic weakness as well as high levels of population. Interestingly, they posit that conditions for insurgency are the main indicators for the likelihood of civil war outbreak. Through bureaucratic weaknesses, insurgency becomes more feasible. Further, because of inadequate policing, retaliation often comes in the form of extreme government crackdowns, which in turn pushes more disenfranchised individuals into the ranks of insurgents. Fearon and Laitin examine 122 conflicts and find significance on coefficients for GDP percapita, population, oil exportation, and new statehood for all categories of civil war, and no significance for such things as ethnolinguistic or religious fractionalization. However, the method used to estimate the model is questionable given the large zero inflation in their data. Further, Fearon & Laiton would apparently have us believe that insurgencies start just because they can.

However, the idea that causes of non-state actor violence are unrelated to grievance factors seems to also be supported by Collier and Hoeffler (2001) who claim that economic variables are far better predictors of civil war than are grievances. The main contention is that weak states breed fear among their citizens who then seek alternative means of governance. This conclusion has some temporal problems, however. The seeds of civil war spring from lower level insurgency and terrorist actions, and Collier and Hoeffler do not examine these antecedents in their research.

Murden (2002) states that globalization has had a diverse effect on Muslim states. He cites Malaysia as a singular story of success among Muslim nations, but points out that Middle Eastern countries have fared especially poorly within the globalization context.<sup>5</sup> The entrenchment of centralized bureaucratic institutions and the concentration of wealth among the ruling class exacerbate an already problematic legitimacy question when the context of broader transnational Muslim concerns and loyalties is incorporated into the analysis. In that sense, Murden combines the two conditions of cause and opportunity to identify motivations for transnational violence, but the pressures of globalization certainly speak toward the question of opportunity and governance legitimacy. Another factor addressed here is the notion that most nations of the Middle East are considered industrializing nations. Thus, while percapita GDP grows, wealth becomes more concentrated, creating an inverse relationship between income and equity of wealth distribution.

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<sup>4</sup> Fearon, James D. and Laitin, David D., *Ethnicity, Insurgency, and Civil War*, American Political Science Review, 2002

<sup>5</sup> Murden, Simon W. , *The Middle East and the New Global Hegemony*, 1984

When looking more specifically at terrorism, things become less clear. The issue stems from lack of a common definition of non-state actor violence. Because of the broad nature of the term, violence conducted for some political end by some entity other than the state, we can assign several descriptions: civil war, insurgency, terrorism. Turk (1982) provides the following definition of terrorism:

*... organized political violence, lethal or nonlethal, designed to deter opposition by maximizing fear, specifically by random targeting of people or sites. Fear may also be promoted by adding repugnant, shocking elements to the violence, for example, mutilation of bodies, torture, maiming, degradation, and destruction of pets and toys. However, such elements are common in violent behavior of all kinds. The defining element of terror is the randomness, not the horror, of the violence.*<sup>6</sup>

Several criticisms can be made of this definition. First, the idea that randomness of terror is its defining factor seems unlikely given actual terrorist occurrences. While suicide terror may seem random to some extent, they are in fact targeted at specific areas and concentrations of people. Further, symbolism is often a very large element to terrorist planning. Turk also claims that the goal of terror violence is to deter. Deterrence, in fact, falls short, where the goal is in fact to promote some substantial change in governance or other political condition. In formulating this definition, however, Turk applies four useful criteria for evaluation: intentionality, objectives, targeting, and organization. These criteria are also embedded within the transformation of environmental inputs into VNSA groups in Thomas and Casebeer (2003). More importantly, these criteria can be used to separate out one form of violence from another. In our case, we wish to examine VNSA who commit terror acts and who organize themselves in ways unrelated to state borders.

Ross (1993) identifies ten structural causes of terrorism, including political system types, modernization levels, presence of other forms of unrest, and what he terms *permissive causes*. Permissive causes reflect the notion of Fearon and Laitin that the opportunity for insurgency itself is a cause of it. Ross uses the same logic for the advent of terror activity in societies. Although an interesting commonality, the similarities largely end there. Ross uses few measures of economic performance in his structural model of terrorism, instead focusing largely on social pressures and such things as availability of weapons and so forth.

Laqueur (2007) states that a strong emphasis on jihad as holy war stems largely from general dissatisfaction with the state of affairs in Arab nations, combined with fear of and resistance to western influences. He largely traces the origins and actions of the Muslim Brotherhood, stating that a major factor in its formation was, what they considered to be, the appalling nature of Turkish secular government under Kemal. Further dissatisfaction with the corrupting influence of the west contributed to the group's radicalization. He goes on to suggest that this process was in most ways similar to the advent of other Middle Eastern Muslim extremist groups.

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<sup>6</sup> Turk, Austin T., *The Social Dynamics of Terrorism*, Annals AAPSS, 1982, page 122

One very interesting point of view on terrorism was posited by Brazilian Carlos Marighela (1971), where he espoused the use of terrorism to create a military situation in which a government would be forced to use such repressive measures to overcome the threat that a population would be forced to revolt.<sup>7</sup> The suggestion here is that strong arm tactics should increase levels of terrorism, causing the situation to further destabilize. On the other hand, Hyams (1975) argues that terrorism is a tool to bring about an environment more receptive to reform until terrorism becomes unnecessary. Riesen (2003) finds that terrorism does cause structural change, confirming the point. These two contrasting notions of terrorism are brought together in Hamilton and Hamilton's (1983) discussion on the social origins of terrorism. They argue that although consequences may be contrasting, causes most likely lie in oppression and inequality rather than opportunity or other structural circumstances. Despite the rather non-quantitative attribution of cause, Hamilton and Hamilton go on to analyze terrorism as a contagion, or biological organism, much like Thomas and Casebeer in their Violent Systems theory. These perspectives, while illuminating, demonstrate how differently and uniquely the notions of insurgency and terrorism can be viewed.

Thomas P.M. Barnett (2004) makes the case that terrorism will arise in what he terms "gap" countries, in which percapita GDP is below 2000 dollars per year, and in which strong modernization pressures exist due to the encroachment of globalization on traditional societies. Although his argument is qualitative in nature, he pleads an interesting case; one in which he builds a broad policy position that has gained a great deal of traction.

In looking at this literature in total, we see some support, both quantitative and qualitative, for viewing causal factors for transnational VNSA groups through the lens of examining both opportunity factors, such as lack of effective governance, low income, and instability, and cause factors such as unequal division of resources and lower levels of ethnic and religious homogeneity in society.

## **II. Theoretical Discussion**

Lacking a general theory for violent non-state actors, this paper focuses on two specific causal concepts: opportunity factors and cause factors. Opportunity refers simply to structural weakness in a given polity that affords the opportunity for VNSA groups to form, become active, and grow. Cause factors deal more with questions of legitimacy and societal structures.

A primary problem with the analysis of non-state actors and the international system is the lack of a clearly defined level of analysis. This paper approaches the problem by looking at micro motivations (or opportunities and causes) for macro behavior (similar to agent-based modeling). That is to say, I look at state level factors that lead to the actions of small, but highly motivated, non-state actors. More specifically, do we see evidence of opportunity and cause by examining state level factors that include levels of RPC, percapita GDP, instability as defined by deaths related to government action on the opportunity side of the argument, and societal homogeneity and legitimacy of governance as understood by the

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<sup>7</sup> Marighela, Carlos, *Minimanual of the urban Guerilla*, 1971

relationship of national power and inequity of wealth distribution owing to industrialization on the cause side?

This research looks specifically at countries of origin of violence perpetrators, and seeks a correlation between opportunity and cause with the number violent acts perpetrated per country per year. Because only higher levels of violence receive attention from states internationally, it is theorized that large numbers of acts are related to higher levels of opportunity and cause. I assume that for non-state actor groups to originate, opportunity to do so is the primary cause of their advent, coupled with some preference for change (cause) in the national or international order. Fearon and Laitin demonstrate convincingly that causes of insurgency can be strongly related to conditions that favor insurgency, specifically in financially and bureaucratically weak states. Thus, this paper looks specifically at conditions in which the opportunity for groups to form exists, and speculates that the more abundant the opportunity, the more frequently events will occur. Because opportunity can be directly related to penetration, extraction, and local policy capacity of the government, which in turn define financial and bureaucratic strength or weakness, I use RPC as a proxy for existence of opportunity within a country. I expect to see low levels of RPC where violent non-state actor groups originate, and an inverse relationship between RPC and numbers of violent acts. I also expect to see a non-linear relationship with levels of income. Violence should be low at exceedingly low levels of income, increase with income levels for some period, then decrease as income levels get very high. This notion is well supported in the literature with respect to localized insurgencies and terrorist groups, so I expect the relationship to hold for transnational violent actor groups and their levels of violence as well.<sup>8</sup> Finally, we look at the notion that strong government intervention fuels additional attacks. We use a measure of instability that is derived from deaths caused by government intervention. We expect this relationship to be a sportive one.

There is empirical evidence that societies with both extremely low levels of income and human capital exist in, what Bueno de Mesquita terms, a poverty trap. Such societies are not great sources of violence. Therefore the expectation here is that the lowest levels of income will not generate significant violence, while slightly higher levels will. The logic here is that in order for violence to take place, enough income must exist that mere subsistence isn't completely consuming an individual's efforts. However, there must also be a cause factor, and here we assume that it is the perception of wealth concentrated only at the highest levels of society. Given this notion, legitimacy of governance is of concern. The expectation is that the concept of Power, as defined by RPC times GDP (Kugler, *et al*, 2000), will be greater in countries that produce more violent non-state actor groups. With very low levels of RPC and lower per-capita GDP but higher levels of power we are describing a situation in which wealth is concentrated, and thus contributing to the perception of illegitimacy of governance.

The other relationship we are looking for is where low levels of income interact with lower levels of societal homogeneity and a stronger tendency to remain self sufficient will resolve into higher levels of violence. Solingen (2007) tells us that one of the primary motivators in

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<sup>8</sup> See Fearon and Laitin, *Ethnicity, Insurgency, and Civil War*, American Political Science Review, August, 2002. Also see Collier and Hoeffler, *Greed and Grievance in Civil War*, Oxford Economic Papers, 2004.

Middle Eastern unrest in comparison to Asian countries with similar initial conditions at the middle of the last century is the desire among Middle Eastern countries for self-sufficiency. While Asian countries adopted a more open economy approach, Middle Eastern countries opted for socialized economies. Solingen finds this difference significant.<sup>9</sup> This self-sufficiency desire is partially proxied with levels of homogeneity in the state, to include linguistic, ethnic, and religious homogeneity levels, which we expect to see negatively correlated. To further address the self-sufficiency notion, the GINI measure is included to look at actual wealth distribution. Because industrialization is expected to be a factor in the quest for self-sufficiency, we expect to see lower levels of GINI where higher levels of power occur, and therefore a seemingly counter intuitive prediction that the relationship will be a negative one with numbers of attacks.

### III. Hypotheses

Having discussed politico-economic dimensions (opportunity) and discontentment issues (cause) for violent non-state actors, I now turn my attention to generating a series of hypotheses linking these issues together. There are two main hypotheses. The first examines politico/economic indicators; the second takes a look at issues that theoretically give cause for VNSA violence.

It is expected that there is a relationship between RPC levels, percapita GDP, and levels of instability in countries of origin for non-state actor groups.

***H1:*** Non-state actor violence increases when countries of origin have low levels of RPC, lower levels but rising per-capita GDP, and greater instability.

This hypothesis gets at the foundations of an important point that for violent non-state actor groups to arise there must be conditions present in which their advent is possible, and that the more severe these conditions are, the more violent events these groups are likely to perpetrate.

The 9/11 attacks are exemplary of this hypotheses. The perpetrators of the act came primarily from Saudi Arabia and Egypt, with a per-capita GDP levels of around \$12,000 and \$4,200,<sup>10</sup> and an RPC levels of .901 and .824. Both of these countries have relatively higher levels of power, but score under 1 in RPC. Some instabilities exist in these countries as well.

Because it is theorized that part of the causal nature for the desire to alter the national or international system is based upon a perceived dissatisfaction with the distribution of wealth in the face of rising national power. This dichotomy addresses the self-sufficiency desire, and disappointment that the benefits from industrialization are not more broadly spread throughout society. Furthermore, this dissatisfaction is expected to intensify with

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<sup>9</sup> Solingen, Eten, *Pax Asiatica versus Bella Levantina*, American Political Science Review, 2007

<sup>10</sup> GDP figures are taken from The World Factbook, published by the United States Central Intelligence Agency. RPC data is taken from the RPC data files provided by Claremont Graduate University. Values are from 2001.

lower levels of societal homogeneity. The combined issues may get at the perception that wealth is settling into the hands of other ethnic or religious groups. Thus, it is hypothesized that:

**H2:** Countries of origin with higher levels of violence will have lower levels societal homogeneity and wealth equity combined with higher levels of power and be less likely to be oil-producing.

There can be no denying the impact that modernization has upon traditional societies. The increased levels of connectivity to the global economy create high levels of contact with alternative societal structures and norms. Further, the rule sets imposed by globalization often require larger utilization of the workforce and higher levels of productivity among workers in order to meet the demand imposed by competition within global markets, to say nothing of expectations with regard to working conditions, civil rights, and so forth. This pressure contrasted with the general desire of self-sufficiency creates unstable circumstances.

But unless there is modernization pressure, then preferences for a traditional society will not necessarily be causal for the advent of transnational non-state actors. Looking at Afghanistan, had it not been for the fact that that country was used as the staging area for the 9/11 attacks, it is unlikely the country would garner much international attention. By and large many African countries also fall into this category. Although disparate levels of RPC and percapita GDP exist, as well as strong preferences for traditional society in many places, African countries produce very few transnational non-state actors. Middle Eastern countries exhibit both external pressures due to the region's importance to the world's energy consumption, and its preference for more traditional society.

But dissatisfaction with governance is the prime result of these pressures. Therefore, it is expected that higher levels of power and wealth inequity will spark feelings of disenfranchisement in the face of external state level pressures.

These hypotheses together form a foundation for understanding that terrorism exists and is more frequent where there are low levels of per-capita GDP and RPC, and where countries have stronger tendencies for self-sufficiency, less homogenized societies, and strongly perceived illegitimacy of governance.

#### **IV. Data and Operationalization**

To analyze these hypotheses, five data sets are used. The International Terrorism: Attributes of Terrorist Events, 1968-2001 (ITERATE 3-4) data set is used to gather information regarding the number of terror attacks from source countries. The Relative Political Capacity data from Kugler, et al, is used to measure opportunity for terrorists and insurgencies using the GDP controlled RPC values. Instability, as proxied by deaths committed by government forces on citizens is also taken from this source. World Development Indicators are used for information regarding per-capita GDP levels. For wealth inequity measures the Gini Index is utilized. Finally, homogeneity data is gathered

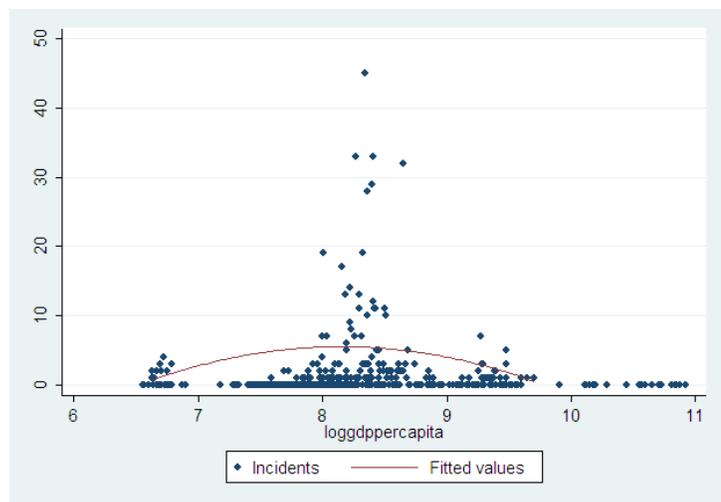
from the Witches Brew Dataset: Linguistic, Religious and Ethnic Fragmentation from Tanja Ellingsen.

The sample is comprised of all Middle Eastern countries spanning years from 1968 to 2001 where corresponding RPC data exists.

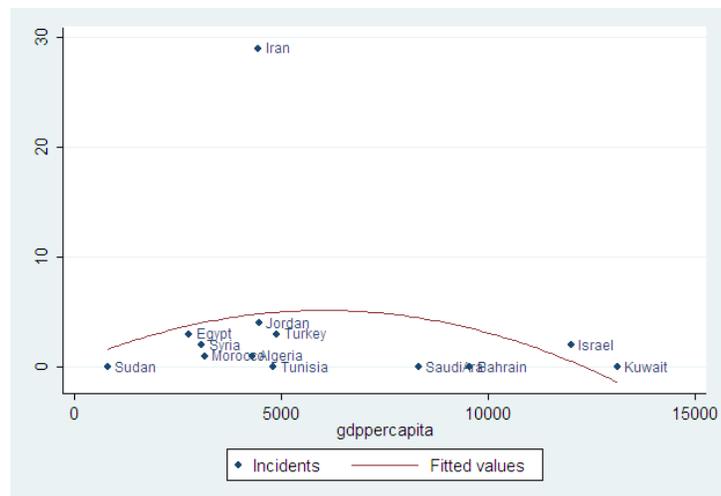
Variables included are number of incidents, RPC of source countries; percapita GDP of source countries; instability as measured by deaths caused by internal government action; Gini; religious, ethnic, and linguistic homogeneity; and a dummy variable for oil producing countries.

The number of incidents per year per country is the dependent variable in both hypotheses.

Relative Political Capacity data includes measures of extraction and capacity for implementation of policy. Thus, it is a measure of efficiency of a government, and where a government is inefficient in its ability to extract resources and implement policy, opportunity for insurgency and the formation of terror groups exists. Because governance legitimacy is also being addressed, from the RPC data I include measures for GDP percapita and GDP controlled RPC (RPC4).<sup>11</sup>



H1 states that transnational terror group violence increases from societies with low levels of RPC, lower levels of per-capita GDP, and higher levels of instability. It is expected that the relationship between levels of violence and RPC will be a negative. The relationship with and per-capita GDP is expected to be non-linear, and be increasing on the lower end of the scale, decreasing on the higher. The inclusion of the two variables for RPC and PCGDP is



<sup>11</sup> GDP controlled RPC is used because both developed and developing countries are included in the sample, thus it provides a good measure of government efficiency based upon economic endowment. For further explanation, see Arbetmen and Johnson, 2005.

necessary in order to give the RPC value a context in terms of the overall wealth of a society when compared with other countries. Where these values are low, a higher opportunity for insurgency exists per Fearon and Laitin (2002), thus the lower the values, the higher the expected number of attacks originating from that country should be. Because instability in society is also an indicator of either oppressive government regimes or existing issues of legitimacy, it is expected that higher levels of instability in a country will correlate to higher levels of violence.

H2 states a more complex idea. Legitimacy of governance should also be a primary cause of non-state actor violence; therefore, the combination of low levels of RPC and per-capita GDP should coincide with high levels of power (being population weighted per-capita GDP multiplied by RPC), showing concentration of wealth. Perceptions of government legitimacy will be exacerbated by high levels of instability measured by deaths caused by government action.

The concept of industrialization in society is also part of the cause portion of this analysis. In industrializing societies we expect to see rising levels of percapita GDP combined with higher levels of inequity in wealth distribution. Thus, we expect that where percapita GDP is increasing, GINI levels should be decreasing. We also control for oil in this analysis. Because we are expecting higher numbers of attacks in industrializing countries, we expect a lower incidence of attacks where country wealth is generated through oils sales. Thus, we expect the sign on the oil dummy variable to be negative.

Homogeneity of ethnicity, religion, and language is also examined. It is expected that where homogeneity levels are lower, violent incidents are more likely to occur, especially where opportunity exists and government legitimacy is questioned. Finally, the dependent variable is simply number of attacks per country per year.

Table 1.

Variable of Interest	Independent Variable	Predicted Sign
H1: Number of Incidents	RPC/Per capita GDP and pcGDP square/ Instability	Negative/Positive- Negative/Positive
H2: Number of Incidents	Power / Homogeneity / Oil / GINI	Positive/Negative/Negative/ Negative

Table 2.

Variable	Mean	Std. Dev.
RPC Source Country (H1)	.0522446	.5875669
LogGDP per capita (H1)	8.322131	.8743323
Instability (H1)	1798.627	10068.64
LogPower (H2)	23.98802	1.63648
GINI (H2)	.33.97621	4.684192
Oil (H2)	.5259594	.4998902
Linguistic Homogeneity (H2)	79.74379	17.24026
Religious Homogeneity (H2)	92.82581	7.775892
Ethnic Homogeneity (H2)	83.56396	17.97658

## Data Issues

Some data issues should be discussed before proceeding. Because of the nature of the ITERATE data, only data is kept where RPC data has been collected. This means that incidents with the ITERATE data that are assigned to “Indeterminate Arabs, Palestine” are not captured. Furthermore, incidents associated with countries that do not have RPC data are also not captured. Countries that are included in this study are Morocco, Algeria, Tunisia, Sudan, Iran, Turkey, Egypt, Syria, Jordan, Israel, Saudi Arabia, Kuwait, and Bahrain. Other Middle Eastern countries not included do not have adequate amounts of data collected to be useful in this estimation.

## V. Model

Hypotheses 1 and 2 are specified in the following model:

$$NumIncidents = \alpha + \beta_1(RPC4) + \beta_2(Instability) + \beta_3(LogPCGDP) + \beta_4(LogPCGDP^2) + \beta_5(LogPower) + \beta_6(Oil) + \beta_7(EthnicHom) + \beta_8(RelHomog) + \beta_9(LingHomog) + \beta_{10}(Gini)$$

Where:

*NumIncidents* is a count of the number of incidents per country per year

*RPC4* is the RPC value for the country of origin

*Instability* is the number of deaths caused by government activity

*LogPCGDP* is the percapita GDP of the country of origin, logged

*LogPCGDP<sup>2</sup>* is the square of the logged per capita GDP (accounting for non-linearity)

*LogPower* is the log of the power of the source country as determined by RPC\*GPD

*Oil* is a binary dummy variable for oil exporting countries

*EthnicHom* percentage of the largest ethnic group

*RelHomog* percentage of the largest religious group

*LingHomog* percentage of the largest linguistic group

*Gini* wealth equity distribution index

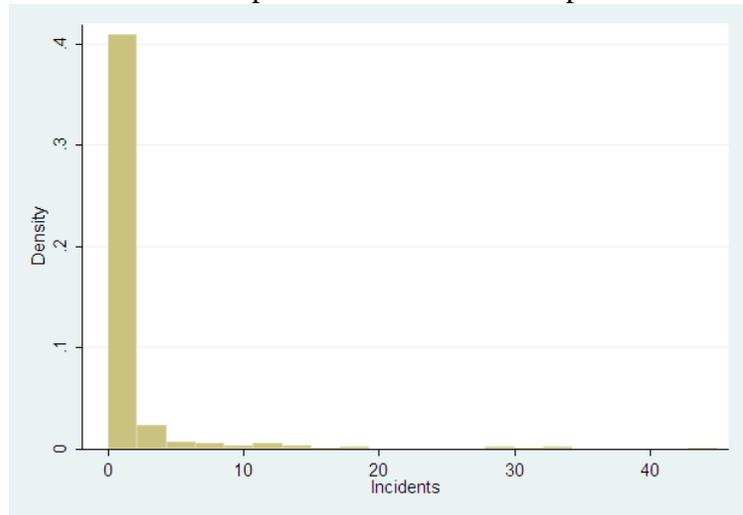
All of the data sets used for these hypotheses are composed of unbalanced panel data. The model is estimated using a zero-inflated poisson method. The process of generating the datasets was composed of adding the disparate source datasets into a single database, then adding a common country code to each separate dataset. The test datasets were then data mined from the resulting database using SQL statements.

## Selecting an Estimation Method and Data Conditioning

Because the dependent variable is a count variable, a poisson estimation method was an obvious choice. However, several diagnostic tests were run and it was determined that a zero-inflated poisson was the most appropriate technique to use with this data. Other methods compared included ordinal logit, multinomial logit, scobit, Prais-Winston, hurdle models, and ordinary least squares. In each case the AIC statistic showed zero-inflated poisson to be the best estimator. The nature of the dependent variable caused panel corrected standard errors to perform less optimally. Vuong tests showed that the zero-inflated model performed better than did ordinary logit methods.

In order to deal with any cross panel or cross temporal autocorrelation, trending variables and variables of a larger scale were logged. These variables include percapita GDP and power. Because interacted marginal effects

were also part of this research, the variables of interest for the marginal effects analysis were mean centered. These variables were RPC4 and log of power. Finally, to deal with any heteroskedasticity in the data, all estimates were run using robust estimation techniques.



## VI. Results

Results are summarized on Table 3, below.

Table 3

General Model	Model 1	Model 2	Model 3	Model 4
DV: No. of Incidents	Opportunity	Cause	Full	ME Interacted
RPC4	-.7566802*** (.2006164)		-1.096231*** (.4173566)	-5.761233 (7.205051)
Instability	.0000106** (.0000005)		.0000007 (.0000005)	.0000006 (.0000005)
LogPCGDP	9.149384** (4.338657)		36.11765*** (11.60857)	37.14267*** (12.73638)
LogPCGDP2	-.5489765** (.2562721)		-2.199297*** (.7056974)	-2.269263*** (.7762285)
LogPower		.3641231*** (.1005752)	.6941174*** (.1341911)	.5849365** (.2299118)
Oil		-.7397416** (.2916303)	-1.42049*** (.3199254)	-1.526318*** (.3978475)
LingHomog		.0122943 (.0091414)	.0184953* (.0102433)	.0140825 (.0119224)

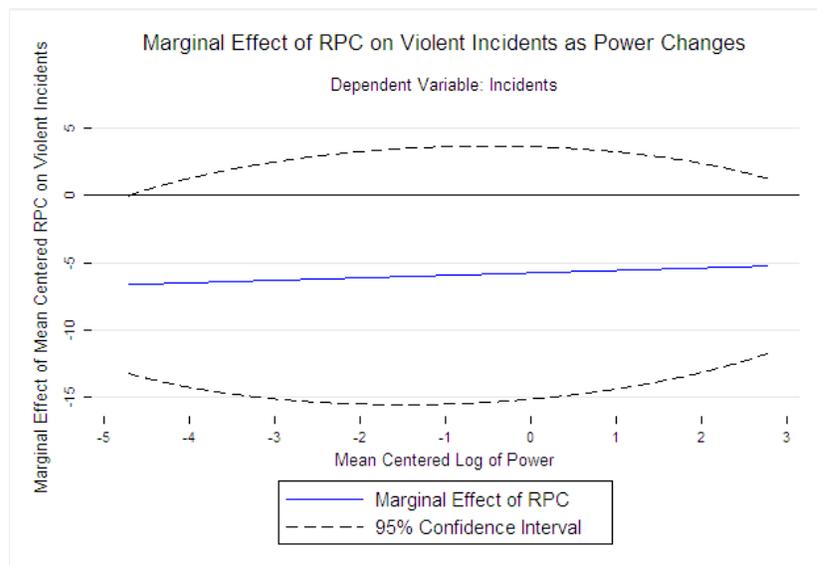
EthHomog		-.0560409*** (.010812)	-.0661368*** (.0174343)	-.0635811*** (.0180939)
RelHomog		.082011*** (.0176442)	-.1614689*** (.0413361)	-.1680164*** (.0448617)
Gini		.0269573 (.025537)	-.0773689* (.0415744)	-.0935515* (.051834)
RPC4xPower				.1846056 (.286421)
Constant	-36.79535** (18.30926)	-3.942645* (2.013877)	-125.1074*** (43.97879)	-127.5394*** (47.80738)
Pseudo R2	.260	.324	.416	.421
chi2	34.60808	47.60907	132.8119	131.83
p	.00000006	.000000001	1.25e-23	7.93e-23
N	368	368	368	368

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

The results shown in Table 3 demonstrate good support for both hypotheses. All of the independent variables have the predicted sign (excepting linguistic homogeneity), and each shows significance with the exception of Instability in the full model. More revealing is that RPC, per-capita GDP, power, are significant in all models, save the interacted model for marginal effects (RPC4 and the interacted term are 99 percent correlated, which explains the lack of significance for RPC here), which means that they are factors in the number of attacks perpetrated. These results make sense theoretically, confirming that opportunity (low government capacity and low but rising wealth among the populace) plays a crucial role in the levels of violence perpetrated by VNSA terror groups. Quite strong support was given to the notion that countries of origin have lower levels of RPC and higher levels of power. Violent incidents rise with increasing percapita GDP to a point, then decline.

GINI index runs counter to percapita GDP. This fits with the notion that industrializing nations initially have disparate wealth distributions. Middle Eastern countries are generally considered to be industrializing, and the results seem to confirm this generalization. If this is taken with consideration that the dummy variable for oil producing countries was both negative and strongly significant, it seems logical

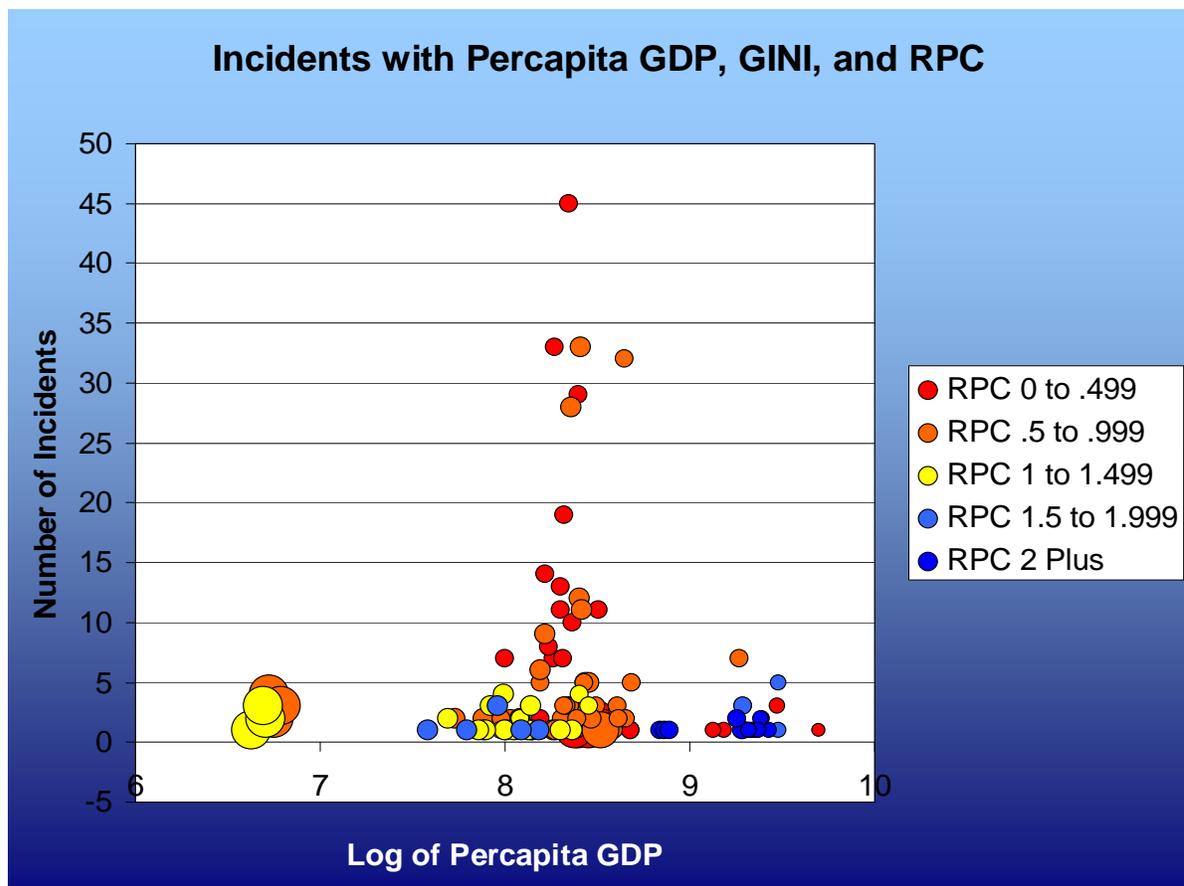
that unredistributed wealth that comes from the people rather than from oil production causes greater levels of dissatisfaction and confirms feelings of governance illegitimacy.



In conjunction with the significance of homogeneity in society, less ethnically and religiously homogenized societies have higher rates of incidents. However, more linguistically homogeneous societies have higher incidents. While counter to theory with respect to linguistic homogeneity, it is possible that in order to have a disagreement, we need to speak the same language.

The marginal effects analysis also yielded interesting and useful results. The intent was to discover if the effectiveness of RPC changed in conjunction with levels of power. Not surprisingly, RPC increases in effectiveness against VNSA terror events as a nation's power grows.

In order to better visualize the interactions of the various ingredients to this study, please see the following bubble graph.



Bubble size represents GINI level, while the various shades represent RPC levels. This chart makes it quite clear the effect of RPC, GINI, and percapita income on numbers of attacks. The graph only shows non-zero incidents; zero incidents are almost entirely blue and are spread across the chart, but concentrate more on the extreme ends. They are excluded here for clarity.

## **Robustness Checks**

Because count data are zero bound and discrete and therefore not continuous, the OLS assumption of continuity is violated. The poisson distribution was shown by both King (1988) and Cameron and Trivedi (1986) to produce count data with significantly less bias and better efficiency. The use of zero-inflated poisson models has come under some criticism due to certain forms of misspecification. The most common and dangerous of these is when the inflated variable is not included in the estimation. In this model, the logged percapita GDP was used as the predictor for excess zeros, which proved to be highly significant at the .001 percent level. Because percapita GDP is also a regressor, this form of misspecification is avoided.

However, as a further check for robustness, the model was also run using several other regression techniques to verify that signs and sizes of coefficients remained consistent. Techniques utilized were: poisson, ordinal logit, scobit, hurdle, panel corrected standard errors, random effects, and OLS (see appendix 1). In all cases the signs and sizes of coefficients remained consistent, with minor exceptions where a variable became insignificant, with only slight variation in sizes of coefficient and some alteration of significance. Poisson models actually had slightly better results, awarding better significance to linguistic homogeneity and significance to Instability. However, a Vounge test indicated that the zero-inflated model was a better fit, and introduced less bias.

## **VII. Conclusion**

With respect to confirming the theoretical foundation laid out in section II the results are encouraging. Both hypotheses gained support from the data, while a few demonstrated quite strong correlations. Quite strong support was given to the notion that countries of origin with higher levels of violence have high opportunity factors. These findings square with much of the literature on the topic, and were robust across various model restrictions. RPC, and per-capita GDP remained robust in both the opportunity and general models, which, combined, provide strong evidence that opportunity is a critical factor with respect to VNSA activity.

The significance of the combination of power and GINI and negative correlation between the two is also an important finding. This significance shows that industrialization and modernization of traditional societies and the desire for self-sufficiency coupled with heightened perceptions of illegitimacy of governance is a motivational force behind the level of violence perpetrated by terror groups.

Meanwhile, the likelihood of violent occurrences perpetrated by these groups increases where source countries have strong inequality of wealth distribution, especially where the society is less ethnically and religiously homogeneous. However, it also appears that linguistic homogeneity in conjunction with these findings is also important.

Relating back to the literature, it appears that opportunity factors as well as grievance factors operate in Middle Eastern environs. This finding contradicts much earlier research

in which it was found that grievance factors do not operate well in the context of non-state actor violence, while opportunity factors, particularly RPC and per-capita GDP, were found to remain robustly significant across multiple model specifications.

These results suggest several possible policy prescriptions. There is certainly something to be said for more equal distributions of wealth, particularly in non-oil producing countries. But given the size of the coefficients, greater levels of governance capacity would appear to be the most effective path to take. But the paradox here is that with increased capacity comes increased perception of illegitimacy of governance. Given the variables tested here, this legitimacy problem can be possibly be approached by addressing the perception that all wealth floats to the top, and providing greater public goods and modernization proceeds. These policy prescriptions, however, are tentative given some of the proxies used in this study. Because the effect of RPC increases as power increases, industrializing countries should seek to maximize their strength of governance as quickly as possible.

One of the findings that seems peculiar is that Countries that have ethnic and religious fractionalization but speak a common language are at a higher risk of non-state actor violence. To some extent this makes sense given that in civil relationships we often need to understand our adversary in order to formulate a grievance with him. However, that particular notion is not addressed by this research and remains speculative.

Of greater note is that instability plays little role in the frequency of non-state actor terror violence. Given that this variable is measured by deaths caused by government interactions, it could indicate that crack-downs and other strong arm tactics may be effective. This conclusion makes sense in the context that greater capacity to act implies greater capacity for governance.

But from a policy perspective, it seems clear that terror violence occurs most often in the early to mid stages of rising percapita income. Thus, more equitable distribution of resources may dampen the number of attacks. Although there are few examples in the sample in which countries with rising percapita GDP also had higher levels of GINI, where those two occurrences meet, there are few instances of violence.

A primary conclusion of this research must be that grievance factors (cause) do in fact operate in the advent of VNSA violence. Where previous research has shown that only economic and opportunity factors matter, this research demonstrates that such conclusions are not correct. It is critical to identify what factor are important and where. To truly understand the relationship between environment and VNSA violence, the data must be disaggregated to the regional and perhaps the state level. Research into this question that proceeds strictly from a pooled data standpoint cannot help but misidentify the causal nature of non-state actor violence.

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