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ORIGINAL PAPER

State-Sponsored Mass Killing in African Wars—Greed or Grievance?

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Abstract What motivates African governments to engage in mass killings at some stage in the armed conflicts? I make the argument that violence against civilians is the outcome of a rational decision process. Using an empirical model, I identify the conditions for civil wars to evolve into mass killings. The results show that the existence of oil onshore and diamonds, the cost of a military conflict, and the number of ethnic groups in a country affect the likelihood of mass killing.

Keywords Mass killing · Civil war · Africa

> "The death toll from conflict in the Democratic Republic of Congo (DRC) is literally one thousand times greater than that in Israel-Palestine, yet it is the latter that is the object of far greater media coverage… [African] conflicts are frequently brushed off and dismissed as being chaotic, or worthy of some vague pity or humanitarian concern, but rarely of any in-depth political analysis."
>
> Virgil Hawkins (2008)

Introduction

A quick search on conflicts in Africa retrieves a list of more than forty armed conflicts involving over nine million refugees and millions of people killed. It is estimated that a total of 5.4 million people have died over the past decade in the conflict between the military of the Democratic Republic of Congo (DRC) and rebel forces of the National Congress for the Defense of the People (CNDP), which surpasses any conflict since World War II (The International Rescue Committee 2008).

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The need to consider plausible reasons for those episodes becomes even more apparent when the International community is asked to intervene in several dissimilar armed conflicts in terms of geographic location, duration, number of deaths, or economic situation, as the civil war in Angola which lasted 27 years (from 1975 to 2002) and caused an estimated 1.1 million deaths; or the repeated conflict episodes between the government of Pakistan and Baluchis (between 1973 and 1977), and more recently in 2004, which killed around 6,000 civilians (Leitenberg 2006—to name just a few episodes.

The political economic literature offers an exploration of ideas and theories to shed light on the perpetration of mass killing by states. Both political scientists and economists have provided theoretical and empirical models to explain genocide, politicide, or democide (Harff and Gurr 1988; Rummel 1994, 1995; Krain 1997; Harff 2003). They also use the models to analyze the mass killing of civilians during civil wars using regression analysis (Valentino et al. 2004; Aydin and Gates 2006; Humphreys and Weinstein 2006; Downes 2006).

The phenomenon of mass killing of civilians by the state has been receiving some attention from economists, notably Sandler and Hartley (2003), Easterly, Gatti and Kurlat (2006), and Montalvo and Reynol-Querol (2005). However, few studies have provided empirical tests of the underlying theoretical model. In this study, I address this deficiency by identifying those conditions that must be met for a civil war to evolve into mass killing. This is done by testing the propositions of a game-theoretic framework (S. Bae and A. Ott's (2008)) through regression analysis.

This paper is arranged as follows: Section Introduction is followed by a discussion of the definition of state sponsored killing in section Mass Killing: Definitions and Concepts. The empirical analysis and estimation results are given in Sections Modeling Mass Killing and Estimation Results, respectively. Section Concluding Remarks is the conclusion.

Mass Killing: Definitions and Concepts

The first issue one needs to grapple with in the process of identifying episodes of mass killing associated with intrastate war or violent conflict is what constitutes mass killing.

A concept that is vastly used in the literature is genocide. According to the Article II of the United Nations (UN) Genocide Convention, Genocide refers to "acts committed with intent to destroy, in whole or in part, a national, ethnical, racial or religious group, as such: (a) Killing members of the group; (b) Causing serious bodily or mental harm to members of the group; (c) Deliberately inflicting on the group conditions of life calculated to bring about its physical destruction in whole or in part; (d) Imposing measures intended to prevent births within the group; (e) Forcibly transferring children of the group to another group."

Since many of this and last century's episodes of mass killing were not due to differences in race or ethnic groups, Harff (1992, p.29) proposed the term politicide as referring to "events in which the victims are defined primarily in terms of their political position—their class, political beliefs, or organized opposition to the state and the dominant group."

The UN's Convention and many studies (Harff and Gurr 1988; Rummel 1995; Krain 1997) focus on intentional killing of civilians as a way of distinguishing acts of mass killing from accidental deaths (including those caused by the unintentional destruction of infrastructure, spread of disease, etc). Therefore, many data sets only considered intentional deaths—those that result directly from a policy intended to affect civilian population; otherwise, they are regarded as collateral damage. However, the intent to destroy expressed in the UN's Convention definition has been criticized (Harff, 2003) since it raises the question of how we can infer the intention of the perpetrators of the killing.

According to Rummel (1995, p.3), the UN definition of genocide does not cover the variety and extent of brutal murder performed by governments, since it excludes the cases when governments starve civilians to death, assassinate sympathizers of anti-government guerrillas, execute prisoners of war, or shoot political opponents.

Other definitions of genocide, politicide, democide, and mass killing have been proposed by other scholars, and several require the killing of substantial or massive number of people so that an episode can be considered mass killing. The adoption of a numerical condition is to some degree arbitrary and has produced quite a few different numerical criteria.

The debate over the definition of genocide, politicide and other related terms has generated a number of papers, although scholars have yet to agree on those definitions. In this paper, I choose to adopt the broad term mass killing and define it as the intentional killing of 1,000 or more people (noncombatants), members of any kind of group (religious, political, racial, ethnic, etc), by state governments in the context of an intrastate conflict[1].

Describing civilians' deaths as intentional is critical in that civilian losses have regularly been described as accidents, an outcome that is barely unintended. Countries have been refining their military capability, and subsequently have adopted a new way of war which relies on bombing even more than before, and use highly sophisticated technology to targeting. The risk of massacres is not only well known by the military planners, but is also a predictable consequence of some military activities[2]. Thus, in this paper the killing of unarmed population is regarded as intentional as is the killing of armed forces.

Modeling Mass Killing

Bae/Ott's (2008) model of mass killing is a one-sided game which, assuming perfect information, describes and solves for the optimal behavior of the perpetrator of mass killing. The main hypothesis derived from the model is that a higher level of a country's level of economic resources is associated with an increase likelihood of

[1] This definition only includes civilians killed in the course of combat. Non-violent deaths caused by war, such as those occurring through starvation or disease, and deaths due to unorganized violence (such as riots) are not included.

[2] For instance, it is expected that high-altitude bombings inevitably leads to the killing of numerous civilians in each campaign. However, military planners rely on high-altitude bombings in order to make the aircrew safe, and decrease the cost of attack.

mass killing. Bae and Ott's findings suggest that increases in the cost of mass killing lead to a decline in the likelihood of mass killing.

Two hypotheses are tested in this paper: the existence of economic resources in a country in conflict is associated with a high likelihood of mass killing, and that an increase in the cost of attack will reduce the likelihood of mass killing. A supplementary hypothesis tested posits that the existence of economic resources in a country will increase the number of people killed in the course of a civil war.

To test the validity of these hypotheses a model of mass killing is estimated employing panel data on episodes of one-sided violence against civilians that occurred in Africa (obtained from the Uppsala Conflict Data Program (UCDP) covering the period 1989 to 2005[3]). This data set includes all direct killings of civilians in armed conflicts conducted by the government. It contains episodes in which the use of armed force resulted in at least 25 civilian deaths per year. It excludes deaths caused indirectly by a conflict (e.g. starvation, disease).

Several measures of natural resources are employed in the estimation: existence of lootable diamonds, production of onshore and offshore oil, and country's production of coca and opium. Data on diamonds only include the secondary deposits (consisting of surface scatterings around a pipe, concentrations in river channels, and marine deposits formed as water fluxes from rivers and are moved by wave action along ocean coasts) due to the fact that secondary sources are easily lootable[4]. Marine deposits that are offshore are assigned as non-lootable and excluded from the dataset, while beach sites are assigned to be lootable.

With respect to oil production, two dummy variables are included: one to identify on-shore deposits and another one for off-shore deposits. Both variables are obtained from the International Peace Research Institute (PRIO).

The variable drug production identifies the existence of coca leaf and opium poppy cultivation in the countries in conflict. Here, three dummy variables are used: one to identify the countries that produce coca leaf, another to identify those that cultivate opium poppy, and a third dummy variable to indicate the countries that produce either coca leaf or opium poppy. The source of data on drugs production is the 2006 World Drug Report, from United Nations Office on Drugs and Crime (UNODC).

Aside from the objective of looting resources, grievances have been identified as a source of violence against civilians. In the absence of proper measures of political exclusion and inter-group hatred, the grievance hypothesis is tested using a measure of ethnic fractionalization developed by Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg, which can take any value from 0 (complete ethnic homogeneity) to 1 (complete heterogeneity)[5].

[3] The term one-sided violence refers to the use of armed force by the government of a state or by an organized group against civilians. It excludes numerous types of violence: criminality and personal violence, as well as fatalities caused by rioting or other types of non-organized social unrest (Eck and Hultman 2007: 235).

[4] A basic mining operation is as simple as using a shovel and a pan. Primary sources for diamonds, which are kimberlite and lamproite pipes, are excluded because they are not easily lootable, since their exploration require more sophisticated techniques and equipment (as large hydraulic shovels and ore trucks).

[5] The fractionalization index was computed by Alesina et al. as one minus the Herfindahl index of ethnolinguistic group shares, and reflected the probability that two randomly selected individuals from a population belonged to different groups. It is given by the formula: $FR_j = 1 - \sum_{i=1}^{N} S_{ij}^2$, where s_{ij} is the share of group i in country j.

National income is an important variable because it represents opportunity costs—the economic opportunities that citizens, generally young men, forgo when they join an army. The income measure used in this study is the logarithm of country's GDP per capita and the source of data on GDP per capita is World Development Indicators Online (WDI).

An increase in the military spending associated with war may either reduce or increase the likelihood of mass killing. To ascertain the direction of effect the variable of interest would have been the cost of military engagement. Since there is not a proper measure of this cost, the country's accumulated military expenditure per capita during a conflict is used in the empirical analysis. Data on military expenditure (in constant 2005 million US dollars) are given by the Stockholm International Peace Research Institute (SIPRI), and data on the country's population are reported in the World Development Indicators Online[6].

The two hypotheses spelled out earlier are tested by estimating the following equation:

$$MKill_{it} = \gamma_1 + \gamma_2 Lmilex_{it} + \gamma_3 Lgdp_{it} + \gamma_4 Diam_{it} + \gamma_5 Oil\_onshore_{it} + \gamma_6 Ethic_{it} + \gamma_7 Opium_{it} + \gamma_8 Coca_{it} + \varepsilon_{it} \quad (1)$$

where i and t refer to conflict episode and time identifiers, respectively. The dependent variable, *MKill*, is a binary response variable which takes the value one when the number of deaths during a conflict episode is equal to or greater than 1,000, and zero otherwise; and the explanatory variables are: log of country's accumulated military expenditure per capita (*Lmilex*), log of country's GDP per capita (*Lgdp*), existence of lootable diamonds (*Diam*), production of oil onshore (*Oil_onshore*), ethnic fractionalization (*Ethnic*), opium poppy's production (*Opium*), and coca leaf's production (*Coca*).

The third hypothesis is tested by estimating the following equation:

$$Ndeaths_{it} = \alpha\gamma_1 + \alpha_2 Lmilex_{it} + \alpha_3 Lgdp_{it} + \alpha_4 Diam_{it} + \alpha_5 Oil\_onshore_{it} + \alpha_6 Oil\_ofshore_{it} + \alpha_7 Ethnic_{it} + \alpha_8 Opium_{it} + \alpha_9 Coca + \varphi_l it \quad (2)$$

where the dependent variable, *Ndeaths*, represents the logarithm of the number of civilians killed each year in the course of a civil war. The explanatory variables are: log of country's accumulated military expenditure per capita (*Lmilex*), log of country's GDP per capita (*Lgdp*), production of lootable diamonds (*Diam*), existence of oil onshore (*Oil_onshore*), existence of oil offshore (*Oil_offshore*), ethnic fractionalization (*Ethnic*), coca leaf's production (*Coca*), and opium poppy's production (*Opium*).

[6] A description of the variables used in the empirical model and their summary statistics are given in Appendix Tables 3 and 4.

Table 1 Random effects probit estimation results (dependent variable: prob mass killing)

	Government Model Coef/t-stat
Log military expenditure per capita	1.4342**
	(3.04)
Log GDP per capita	−0.4102
	(0.62)
Diamonds	9.0435**
	(2.54)
Oil onshore	12.0349*
	(1.96)
Ethnic fractionalization	−32.9657*
	(−1.42)
Opium	−24.4600
	(−0.00)
Coca	.
	.
Constant	25.6952***
	(3.49)
N. of obs.	221

*$p<0.05$, **$p<0.01$, ***$p<0.001$

Estimation Results

The hypotheses are tested using panel data on episodes of one-sided violence against civilians from 1989 to 2005 employing random-effects-probit and random-effects models.

The choice of random-effects over the fixed-effects model is due to the nature of the dataset. Since some of the variables employed in the analysis are time invariant (ethnic fractionalization and dummy variables identifying the production of natural resources), the random-effects procedure is the adequate method to determine the impact of those variables on the likelihood of mass killing.

A major concern in using GDP and the country's level of military expenditure as causes of violence is that they are probably endogenous to mass killing. Conflicts are likely to have an effect on GDP, as mass killings may affect the military cost of attack. The expectation is that an increase in the cost of attack decreases the probability of mass killing and the number of civilians killed. However, when military expenditure is used as a proxy for the cost of attack, it is also expected that an increase in the number of killings increases the level of military expenditure[7]. Nevertheless, the

[7] Some may also argue that some mass killing episodes occur because the attacker relies on attack techniques that involve low costs. For instance, it is expected that high-altitude bombings, which lead to the killing of numerous civilians in each campaign, decrease the cost of attack.

lack of reasonable instrumental variables limits the ability to fix the potential endogeneity problems in the analysis.

Equation (1) is estimated for the conflict episodes in which the actor of mass killing against civilians is the government of a state and the estimation results are given in Table 1.

The results suggest that high levels of per capita military expenditure and the existence of onshore oil increase the probability of mass killing episodes.

Concerning the effect of diamonds production on the probability of mass killing, the estimation results confirm that the existence of lootable diamonds in a country in conflict increases the probability of mass killing episodes.

Not surprisingly, the production of onshore oil in a country in conflict has a significant effect on the probability of mass killing. The existence of oil onshore has a positive effect on the likelihood of mass killing when the government of a state perpetrates the attack against civilian populations.

Opium production has an insignificant impact on the probability of occurrence of mass killing episodes. It should be noted that the variable coca leaf's production is dropped in the model estimates.

The ethnic variable is negative and statistically significant. This result implies that ethnic divisions do play a role in determining the likelihood of mass killing in conflict episodes carried out by governments—ethnic diversity lowers the risk of

Table 2 Random effects estimation results (dependent variable: log deaths)

	Government Model Coef/t-stat
Log military expenditure pc	0.4531**
	(2.54)
Log GDP per capita	−0.8154*
	(−2.40)
Diamonds	2.1659*
	(2.32)
Oil onshore	2.5373**
	(2.47)
Oil offshore	0.8157
	(1.25)
Ethnic fractionalization	−7.3358***
	(3.45)
Coca leaf production	.
	.
Opium poppy production	−5.1071**
	(−3.14)
constant	12.9355***
	(4.15)
N. of obs.	221

*$p<0.05$, **$p<0.01$, ***$p<0.001$

mass killing. This finding contradicts the studies that suggest that the probability that a state will engage in mass killing increases as the number of ethnic factions increases, and confirms Collier and Hoeffler's (2002) argument that societies characterized by ethnic diversity are less prone to violence than homogeneous societies in which the largest ethnic or religious group has somewhere between 45% and 90% of the population.

With respect to the determinants of the number of civilians killed each year during civil war, Eq. (2) is estimated and the results are given in Table 2.

The results show that rich countries are associated with fewer civilian deaths, and that the amount of military expenditure per capita in countries in conflict does affect the number of civilians killed. The GDP coefficient is explained by the notion that the higher the opportunity costs of joining the army, the lower is the population support of violent conflicts, and thus, the lower is the level of violence during civil wars.

The production of opium poppy affects the number of people killed during an armed conflict. Coca leaf production was dropped since no country in Eq. (2) produces coca leaf.

The existence of lootable diamonds and oil onshore increase the number of people killed during an armed conflict. This result can be explained by the fact that rebel groups often are located in resource-rich regions of the country, and thus, the violence against the population during intrastate wars may be viewed as a way for the government to gain access to natural resources, or soldiers to loot in order to augment their resources (Billon 2001; Azam and Hoeffler 2002; Ross 2003; Gilmore and Lujala 2003)[8].

The ethnic variable is significant and negative, suggesting that ethnically diverse societies are associated with a lower number of people killed during a civil war than homogenous societies.

Concluding Remarks

This paper offers an empirical test of some implications of a mass killing model that postulates that the act is the outcome of a rational decision process. Using panel data on one-sided violence against civilians occurred in Africa during the period 1989 to 2005, three hypotheses are tested. The main hypothesis is that the existence of economic resources, such as oil, diamonds or drugs, has a positive effect on the likelihood of mass killing. The two other hypotheses are: an increase in the military spending in a conflict reduces the probability of mass killing; and the existence of economic resources in a country in conflict is associated with a high number of civilians killed in the course of a civil war.

[8] Democratic Republic of Congo (DRC) is perhaps the best example of this argument. Five Congolese rebellions originated in the resource-rich regions of Katanga, Kivu, and Kasai. During the 1990s, in Angola, UNITA sold hundreds of millions dollars worth of diamonds to finance the war; Afghanistan's Northern Alliance financed itself through the sale of around 50 million dollars of lapis lazuli annually (Ross 2003).

The estimation results confirm the greed hypothesis that natural resources affect the likelihood of mass killing. In fact, the existence of diamond and oil onshore in a country in conflict increases the probability of occurrence of mass killing episodes carried out by governments. The level of a country's military spending turned out to increase the likelihood of mass killing.

The estimation results also corroborate the grievance theory by showing that ethnic divisions do play a role to the violence perpetrated by the governments against civilians in conflicts in Africa.

The third hypothesis was also confirmed. The existence of natural resources does affect the number of civilians killed in the course of a civil war when the government of the state is the perpetrator of the attack.

Appendix

Table 3 Mass Killing—Variables and Data Sources

Variables	Sources
Population size	World Development Indicators Online (WDI)
GDP per capita	World Development Indicators Online (WDI)
Mass Killing	Uppsala Conflict Data Program (UCDP)
Natural resources	PRIO: Grouped dataset of assumed lootable diamond resources (kimberlite or lamprolite diamonds); Grouped dataset of assumed lootable diamond resources (alluvial diamonds) with known production; shared river basin database (can be used with COW dataset).
	United Nations Office on Drugs and Crime (UNODC) is the source of data on drugs production (2006 World Drug Report).
Military expenditure	Stockholm International Peace Research Institute (SIPRI)
Ethnic fractionalization	Alesina, Devleeschauwer, Easterly, Kurlat, and Wacziarg

Table 4 Mass Killing—Variables and Data Sources

Stats	***diam***	***oil_on***	***oil_off***	***oil***	***nat_res***	***ethnic***	***cntry_id***	***opium***	***coca***	***drugs***	***masskill***	***milex***	***gdp***
N	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004	1004
Mean	0.4920	0.5249	0.6036	0.6663	0.7938	0.6895	14.4801	0.0478	0	0.0478	0.0099	713.4594	625.375
Sd	0.5002	0.4996	0.4894	0.4717	0.4048	0.2396	15.9046	0.2135	0	0.2135	0.0993	1156.045	835.6465
Variance	0.2502	0.2496	0.2395	0.2225	0.1638	0.0574	252.9558	0.0456	0	0.0456	0.0099	1336441	698305.1
max	1	1	1	1	1	0.9302	57	1	0	1	1	5286	3405.865
Min	0	0	0	0	0	0.1836	1	0	0	0	0	7.8	56.5202
Skewness	0.0319	−0.0997	−0.4235	−0.7055	−1.4526	−0.9499	1.7059	4.2387	.	4.2387	9.8696	1.8775	2.0707
kurtosis	1.0010	1.0099	1.1794	1.4978	3.1099	2.3259	4.8819	18.9669	.	18.9669	98.4101	5.7295	6.28250

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