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**Understanding the Etiology of Electoral Violence:
The Case of Zimbabwe**

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David Fielding*

Abstract

Recent theoretical and empirical work indicates that incumbent governments are likely to attempt to influence election outcomes by violent means (rather than by bribery and fraud) when their level of popular support is relatively low. However, evidence also suggests that in some countries electoral violence can be quite easy to thwart through peaceful means. This may seem surprising when the incumbent has control over an extensive and well-equipped state security apparatus. The analysis of Zimbabwean data in this paper suggests an explanation: the incumbent prefers to avoid the direct involvement of the state security apparatus when intimidating voters (perhaps because such involvement would undermine the incumbent's legitimacy abroad), and relies instead on informal groups with very limited organizational capacity. One consequence in Zimbabwe is that the intimidation is heavily focused in places where the incumbent is relatively popular, *ceteris paribus*.

Key words: Elections; Voter intimidation; Zimbabwe

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1. Introduction

International groups such as the Carter Center, the International Foundation for Electoral Systems, the National Democratic Institute, and the Office for Democratic Institutions and Human Rights devote extensive resources to monitoring elections in countries where democratic institutions are fragile. One potential concern with such monitoring activities is that electoral fraud is easier to detect and document (at least in the first instance) than intimidation and violence. If fraud becomes more difficult, then candidates may turn to violence instead. Analysis of African electoral data by Daxecker (2012, 2014) suggests that monitoring leads to higher electoral violence, especially in places where fraud is already prevalent.¹

One solution to this dilemma might be to supplement traditional election monitoring with interventions designed to discourage electoral violence. However, most electoral violence in Africa is perpetrated by incumbent governments (Strauss and Taylor, 2009). These governments typically have access to an extensive state security apparatus, and in many cases they have originally come to power through a civil war or independence struggle that tends to instill a ‘culture of violence’ (Omotola, 2010). In such circumstances, one might doubt that traditional electoral monitoring organizations have the capacity to limit the use of violence during elections. Nevertheless, Collier and Vicente (2014) describe a field experiment in which a simple and peaceful publicity campaign by an international aid organization has a significant effect in reducing electoral violence in Nigeria. One possible explanation for this puzzling result is that

¹ However, a similar study by Fjelde and Höglund (2015) fails to find a significant monitoring effect, and this literature still awaits a meta-analysis.

‘electoral authoritarian regimes’ which maintain power through the manipulation of elections (Schedler, 2006) are more constrained than autocracies when using state security forces to intimidate the populace. Such regimes may be motivated to seek international support by adhering to some of the norms of western liberal democracies, and the overt use of state organizations to instil terror may undermine this support.

We explore this explanation using data on violence in Zimbabwe around the time of the parliamentary and presidential elections of 2008. Zimbabwe has had the same leader (Robert Mugabe) and the same ruling party (the Zimbabwe African National Union – Popular Front, ZANU-PF) since the Independence War of the 1970s. Anecdotal evidence about violence in Zimbabwean elections is often used in discussions of the strategies of electoral authoritarian regimes: see for example Bhasin and Gandhi (2013), Hafner-Burton *et al.* (2013), and Höglund (2009). The Zimbabwean experience has also been used to motivate recent theoretical models of electoral strategies, which predict that violence and intimidation will be preferred to bribery and fraud when the level of core support for the incumbent regime is relatively low (Chaturvedi, 2005; Collier and Vicente, 2012). The evidence we present indicates that the incumbent regime in Zimbabwe faces substantial resource constraints when using violence and intimidation to influence electoral outcomes. *Ceteris paribus*, regional variation in the level of violence around the time of the 2008 presidential election was strongly negatively correlated with support for the political opposition (the Movement for Democratic Change, MDC). Incumbent regime violence did succeed in influencing the result of the election, but this violence was largely targeted at MDC supporters in places where they were in a minority. This suggests that even a

new and largely peaceful opposition movement has the potential to discourage violent electoral strategies.

The next section briefly describes the historical context of the 2008 elections in Zimbabwe; subsequent sections present the data and statistical analysis.

2. Elections in Zimbabwe

The ruling ZANU-PF party was formed in 1987 as a union of the original ZANU (largely associated with the majority Shona ethnic group and in power since 1980) and the Zimbabwe African People's Union (largely associated with the minority Ndebele).² Although some state repression in the early 1980s targeted the Ndebele as a group (Bratton and Masunungure, 2008), repression and opposition since the 1990s have not been ethnically motivated.³ Robert Mugabe is the leader of ZANU-PF; he was prime minister under a non-executive president from 1980 to 1987, and has been executive president of Zimbabwe since 1987. The first serious challenge to ZANU-PF rule came in the 2000 parliamentary elections, when the newly created MDC won 47% of the national vote and 57 out of 120 parliamentary seats. The MDC leader, Morgan Tsvangirai, subsequently won 42% of the national vote in the 2002 presidential election. However, until 2008, ZANU-PF always commanded a clear majority of parliamentary seats and presidential votes. Between 2000 and 2008, a large part of government

² A small group of ZAPU supporters split from ZANU-PF in 2008, but they have not been a major force in electoral politics.

³ In this respect Zimbabwean electoral violence differs from electoral violence in some other African countries, for example Kenya (Dercon and Gutiérrez-Romero, 2012; Gutiérrez-Romero, 2012).

intimidation was targeted at white farm owners and businesses associated with the MDC (Makumbe, 2009), and there were relatively few attacks on other Zimbabweans.

This pattern of violence changed in 2008. On March 29, Zimbabwe held parliamentary elections and the first round of a presidential election. The MDC won 51% of the national vote in the parliamentary elections and 110 out of the 210 parliamentary seats,⁴ compared with 46% of the vote and 99 seats for ZANU-PF. Correspondingly, Tsvangirai won 48% of the first-round presidential vote, compared with 43% for Mugabe. Although there were some allegations of vote-rigging and some violence before the elections, monitors from the Southern African Development Community (SADC) concluded that the elections had been largely free and fair. The MDC now held a majority of seats in parliament, and although a second round of the presidential election was required, neither of the main candidates having won 50% of the national vote, Tsvangirai could reasonably expect to be elected president.

ZANU-PF appears not to have anticipated the size of the vote for the MDC, and over the next three months there was a sharp rise in the number of violent attacks on MDC supporters (Human Rights Watch, 2008). The second round of the presidential election was delayed until June 29, and although Tsvangirai initially declared that he would stand in the second round, the level of violence against his supporters eventually persuaded him to withdraw. Mugabe was therefore elected president, with the SADC monitoring team concluding that '[t]he elections did not represent the will of the people of Zimbabwe' (SADC

⁴ By this time the MDC was split into two factions, which nevertheless co-operated with each other. The MDC-T won 100 seats while the MDC-M won 10 seats.

Election Observer Mission, 2008). An internationally negotiated compromise allocated some executive roles to the MDC during the period of the parliament, but ZANU-PF retained control of key state institutions, including the police and armed forces. Among allegations of extensive vote-rigging, ZANU-PF won a majority of seats in the 2013 parliamentary elections, and Mugabe was elected president in the first round of voting.

3. Data on Electoral Violence

Our statistical analysis will be based on two main data sources. The first of these is Version 5 of the Armed Conflict Location and Event Data Project (ACLED), downloaded from www.acleddata.com on 1 March 2015. The ACLED database includes geographically disaggregated information that allows us to create a dataset of the total number of violent attacks on civilians perpetrated by different groups during each month between 2000 and 2014 in each of the 90 districts of Zimbabwe. (These districts are the basic geographical units used in the 2012 Census of Zimbabwe.) The main forms of violence are assault, arson and murder. Table 1 and Figure 1 provide an overview of some of the characteristics of this dataset. Table 1 shows that in around two thirds of the 3,846 individual attacks the principal perpetrators were ZANU-PF activists, while in around one third the principal perpetrators were state security personnel. Attacks attributed to MDC activists account for under 0.5% of cases, and the assailants were unidentified in just over 0.5% of cases. (The context of most attacks in this last category suggests that they were probably by ZANU-PF activists.) Figure 1 shows the monthly time series for all attacks over 2007-2009: it can be seen that a very large proportion of the attacks occurred in May-June 2008, in the run-up

to the second round of the presidential election. There is relatively little variation in the total number of attacks across other months, and this is also a characteristic of the data over 2000-2006 and 2010-2014.

Table 1 provides a somewhat simplified description of the violence, since many of the attacks by activists involved security personnel as secondary actors, while many of the attacks by security personnel involved activists as secondary actors. For example, a victim might be arrested by police and then assaulted by activists at the police station, or assaulted first and then arrested. Nevertheless, the overall picture is of a network of violence that relies heavily on party activists. How are these activists organized, and to what resources do they have access? Some data on activist organization is provided in Sokwanele (2010), which is based on information collected covertly by a team of researchers in 15 of the parliamentary constituencies where the violence was most intense; these constituencies are listed in Appendix 1. The information is based on individual face-to-face interviews, and relates to violence during the 2008 election period and violence during 2010. The Sokwanele report reveals that each activist involved in attacks is attached to a particular 'base': the bases, each of which comprises between five and 20 activists, are situated in a wide range of locations including abandoned schools, abandoned farms, party offices, and offices taken from international aid organizations. Data in the report relate to 83 bases across the 15 constituencies. For all bases there are estimates of the total number of attacks on civilians, and for some there is a list of personnel and equipment, as well as a summary of the bases' organizational structure. Figure 2 provides illustrative information about the organization of the six bases in the Maramba-Pfungwe constituency. While the perpetrators of violence are all party activists or

members of militia connected to ZANU-PF (such as the Youth Militia and ‘War Veterans’), control of the bases involves a chain of command that ultimately includes army officers, local politicians and traditional tribal leaders.

The indirect involvement of senior security force officers and politicians in the organization of bases maintains some distance between the government and the political violence. This distance reduces the number of attacks that can be blamed directly on government officials, and may be a way of trying to retain the international legitimacy of Zimbabwe as a democratic state. However, the absence of a direct connection to the security forces also limits the bases’ access to equipment. In some cases, the Sokwanele report includes a list of the equipment in the possession of an individual base. Many bases are very limited in terms of transport and firearms: for example, the eight bases in the Shamva South constituency appear to share one landrover and one truck, and only one activist there has been seen with a firearm. Most attacks are carried out with clubs or machetes, and sometimes the perpetrators appear to have travelled from the base on foot. With such limited equipment, the feasibility of inculcating terror may depend on a very low level of opposition capacity to organize protection for its own activists, and in 2007 the MDC formed a network of ‘Democratic Resistance Committees’ designed to protect its activists from attack (Sachikonye, 2011; Mungure, 2014), although these committees seem not to have been equally effective in all parts of the country. This leads us to two hypotheses:

H1: A greater level of opposition support in a district reduces the number of attacks there.

H2: A greater level of opposition support in a constituency reduces the number of attacks per base in that constituency.

In H2, the negative association arises because better opposition organization reduces the effectiveness of each base. This effect may have led ZANU-PF to create more bases in districts where opposition was weakest, in which case the negative association in H1 will be magnified. (Even if Tsvangirai had contested the second round of the 2008 presidential election, all that would have mattered was the total number of votes for each candidate, not their geographical distribution. Preventing MDC supporters from voting in places where they were a minority would have been sufficient to deliver a majority for Mugabe.) The magnification effect can be expressed as a third hypothesis.

H3: The effect in H1 is larger than the effect in H2.

The next section presents the statistical analysis used to test these hypotheses.

4. Data Analysis

4.1 District-level data

We test hypothesis H1 by modeling the determinants of the number of violent incidents perpetrated in each district j , designated vio_j . Attacks perpetrated by the MDC are excluded from the total but attacks by unknown assailants are included. (These attacks make up such a small proportion of the total that their inclusion makes no substantial difference to the results.) The variable vio_j is measured using ACLED data for a number of different sub-periods, so we are able to determine whether the pattern of violence has been stable over time.

Our key explanatory variable is a measure of the level of support for the opposition versus the level of support for ZANU-PF. This variable is constructed using constituency election results aggregated to the district level.⁵ Support for the opposition might be measured using total votes for the MDC and smaller opposition parties, but this is likely to underestimate their total support, since some supporters may have been intimidated from going to vote. We therefore measure opposition support as the total share of the electorate not voting for ZANU-PF, including abstentions. Results using a measure that excludes abstentions are broadly similar to those reported below, and are available on request.

Note that although support for the opposition increased in the parliamentary elections of 2008, this effect seems to have been quite uniform across the country. The coefficient of correlation across districts between opposition support in the 2005 parliamentary elections ($opp05_j$) and opposition support in the 2008 parliamentary elections ($opp08_j$) is 0.85. Moreover, as shown in Table 2, the key determinants of opposition support in 2008 were the same as those in 2005. Table 2 reports estimates of coefficients in the following model:

$$\begin{aligned} \ln(opp05_j) - \ln(1 - opp05_j) &= \kappa_{05} + \beta_{05} \cdot urban_j + \gamma_{05} \cdot literacy_j \\ &+ \delta_{05} \cdot mortality_j + \zeta_{05} \cdot electricity_j + \eta_{05} \cdot unemp_j + u05_j \end{aligned} \tag{1}$$

$$\begin{aligned} \ln(opp08_j) - \ln(1 - opp08_j) &= \kappa_{08} + \beta_{08} \cdot urban_j + \gamma_{08} \cdot literacy_j \\ &+ \delta_{08} \cdot mortality_j + \zeta_{08} \cdot electricity_j + \eta_{08} \cdot unemp_j + u08_j \end{aligned}$$

⁵ Some parliamentary constituency boundaries overlap those of the 90 census districts. Appendix 2 discusses how this complication is dealt with.

Here, $urban_j$ is the proportion of people in the district living in an urban area, $literacy_j$ is the proportion of adults who are literate, $mortality_j$ is the infant mortality rate, $electricity_j$ is the proportion of households with access to electricity and $unemp_j$ is the unemployment rate. Data are taken from the 2012 Census of Zimbabwe, and all variables are measured as percentages. The residuals $u05_j$ and $u08_j$ are correlated, so the table reports Seemingly Unrelated Regression estimates. In both 2005 and 2008, the two significant correlates of support for the opposition were the infant mortality rate (which had a negative effect) and the unemployment rate (which had a positive effect).⁶ It would be interesting to find out whether the government's strategy of violence in 2008 responded more to historical opposition support ($opp05_j$) or to news about current levels of opposition support ($opp08_j$), but the high correlation between the two means that it does not make sense to include both variables in a model of violence: the t-ratios on the coefficient estimates would be strongly biased towards zero. Therefore, $opp05_j$ is used as our key measure of opposition support, but we also include $opp-dif_j = opp08_j - opp05_j$ in the model, in order to see whether changes in the level of support had any effect on the strategy of violence.

Our core model takes the form of a regression of vio_j in each year on $opp05_j$, $opp-dif_j$, $urban_j$, the total population of the district (pop_j), and violence in the previous year (vio_{-1j}). In this way we control for the possibility that violence may be more prevalent in more populous or more densely populated areas, and that it may exhibit some persistence over time. We fit this model for 2007 (the

⁶ High infant mortality is associated with rural poverty and high unemployment with urban poverty: support for ZANU-PF is strongest among the rural poor while support for the MDC is strongest among the urban poor.

year before the elections, during which the Democratic Resistance Committees were founded), 2008, 2009 and 2010. Descriptive statistics for the variables are reported in the left-hand panel of Table 3. As Table 3 and Figure 1 show, the mean level of violence in 2008 was very much higher than in other years. Since vio_j is a count variable, we use a Negative Binomial regression equation in which vio_j is assumed to have a Poisson distribution with a mean equal to:

$$E[vio_j] = \exp(\theta_0 + \theta_1 \cdot I[vio_{1j} > 0] + \theta_2 \cdot \max(\ln(vio_{1j}), 0) + \theta_3 \cdot opp05_j + \theta_4 \cdot opp-dif_j + \theta_5 \cdot urban_j + \theta_6 \cdot \ln(pop_j) + v_j) \quad (2)$$

Here, the distribution of the over-dispersion term v_j is $v_j \sim \ln(\Gamma(1/\alpha, \alpha))$.

One possible concern with equation (2) is that the capacity to resist violence in a district may also depend on the level of poverty there, and, as Table 2 shows, poverty is correlated with opposition support. This may bias the estimates of θ_3 and θ_4 . For this reason we also fit an extended model in which $E[vio_j]$ also depends on *literacy_j*, *mortality_j*, *electricity_j*, and *unemp_j*. Table 4 reports parameter estimates for both models and all four years.

Table 4 shows that the pattern of violence in 2008 is very different from the pattern in 2007 and 2010. In 2008 there is no significant dependence on violence in the previous year, but the level of opposition support (*opp05_j*) is a significant explanatory variable. In 2007 and 2010 there is significant dependence on violence in the previous year, but opposition support has no significant effect.⁷

⁷ One possible explanation for the variation in the level of persistence in *vio* is that with the upsurge in violence in 2008 a large number of attacks were organized by newly created (or newly activated) ZANU-PF bases, whereas in other years attacks were organized by existing bases.

The estimates for 2008 indicate that a one percentage point increase in opposition support (as measured by voting in 2005) can be expected to reduce the number of violent attacks in a district by around 6-7%; this estimate is not sensitive to whether the correlates of poverty are included in the model. However, the change in support between 2005 and 2008, *opp-dif_j*, has no significant effect on the level of violence. Overall, Table 4 provides support for hypothesis H1 in the high-violence year of 2008 but not in the low-violence years of 2007 and 2010. The pattern of violence in 2009 shares features of both 2008 and 2010: both the level of violence in the previous year and the level of opposition support have a significant effect on 2009 violence. The estimated coefficient on *opp05_j* is slightly smaller in 2009 than in 2008, but the difference is statistically insignificant.⁸

The variation in the pattern of violence across different years motivates the analysis summarized in Table 5, which reports the results of fitting the model to data for different periods within the election year of 2008. Results for four sub-periods are shown in the table: before the parliamentary elections (January to March), after the parliamentary elections (April to December), the high-violence post-election months (May-June), and the other post-election months (April plus July to December). The results are quite similar across the last three of these sub-periods but differ from the results for the first sub-period, suggesting that the parliamentary elections were associated with a change in the pattern of violence that persisted throughout the year. For January to March there is a small and marginally significant effect of opposition support, a one percentage point increase in support reducing the number of attacks by around 3%. For the other

⁸ 2009 is the one year in which *opp-dif* also has a significant effect on the level of violence, suggesting that by 2009 the changes in support for the opposition in 2008 were beginning to have an effect.

sub-periods the effect of opposition support is significant at the 1% level, a one percentage point increase in support reducing the number of attacks by around 6-7%, as in the 2008 results in Table 4.

One possible reason for the change in the pattern of violence is that from early 2008 onwards the newly-formed Democratic Resistance Committees were effective in limiting attacks in areas of MDC strength. This pattern appears to have persisted through 2008 and 2009, and is equally apparent in the high-violence and low-violence months.

4.2 Base-level data

We test hypothesis H2 by modeling the determinants of the number of violent incidents perpetrated by each base i , as reported in Sokwanele (2010); this variable is designated *vio-base _{i}* . Our key explanatory variable is a measure of the level of opposition support in the constituency in which the base is located. Since some of the constituency boundaries changed between 2005 and 2008, it is not possible to make a direct comparison of opposition support across the two elections. For this reason the model of *vio-base _{j}* contains a single measure of popular support for the opposition, which is based on the 2008 parliamentary election results. Opposition support is measured as the proportion of the electorate in the constituency (k) who voted for opposition parties or abstained; this variable is designated *opp08 _{k}* . However, Sokwanele (2010) contains information from which a second measure of opposition support can be constructed: the proportion of traditional leaders in the constituency (tribal chiefs, headmen and village heads) who are explicit supporters of the MDC; this

variable is designated *mdc-heads_k*.⁹ Many traditional leaders in rural areas are in a position to allocate substantial resources either to the ZANU-PF bases or to the Democratic Resistance Committees.

Our core model of base violence is a Random-Effects Poisson regression of *vio-base_i* on *opp08_k*, *mdc-heads_k* and *urban_j*. The dependent variable is assumed to have a Poisson distribution with a mean equal to:¹⁰

$$E[vio-base_i] = \exp(\lambda_0 + \lambda_1 \cdot opp08_k + \lambda_2 \cdot mdc-heads_k + \lambda_3 \cdot urban_j + w_k) \quad (3)$$

Here, the distribution of the random effect w_k is $w_k \sim N(0, \varphi^2)$, and $i \in k \in j$. In addition, we report results from a model that includes the district-level correlates of poverty (*literacy_j*, *mortality_j*, *electricity_j*, and *unemp_j*). Descriptive statistics for these variables appear in the right-hand panel of Table 3. The table shows that there are some differences between the characteristics of the 15 predominantly rural, relatively pro-ZANU constituencies in the Sokwanele report and the characteristics of the average Zimbabwean district. The 15 constituencies have lower levels of literacy and access to electricity, and higher infant mortality, but they also have lower rates of unemployment.

Results from fitting equation (3) to the data are reported in Table 6, which shows the estimated coefficient on *opp08_k* is negative and significantly different from zero, providing support for hypothesis H2. A one percentage point increase

⁹ Only a tiny proportion of leaders have no explicit affiliation, and the majority have varying degrees of attachment to ZANU-PF.

¹⁰ Unlike the model in equation (2), the equation (3) model includes no over-dispersion term. When an over-dispersion term is added to the equation (3) model, the corresponding parameter is very imprecisely estimated and insignificantly different from zero.

in opposition support can be expected to reduce the number of attacks per base by around 6%; this effect is robust to the inclusion of the correlates of poverty.¹¹ The estimated coefficient on *mdc-heads_k* is also negative, although it is much smaller in value and significantly different from zero only when the correlates of poverty are included in the model. A one percentage point increase in the proportion of heads who support the MDC can be expected to reduce violence by around 1%.

Comparison of the results for violence per district and violence per base does not provide any support for Hypothesis H3. As shown in Table 3, the standard deviation of the number of attacks per district in 2008 is very close to the standard deviation of the number of attacks per base (18.6 versus 17.3), and a one percentage point increase in opposition support reduces both of these numbers by around 6-7%. In other words, there is no evidence that the district-level results are partly explained by a correlation between the level of opposition support and concentration of bases.

¹¹ The one correlate of poverty that is strongly associated with violence in Table 6 is the rate of unemployment: a one percentage point increase in the rate of unemployment can be expected to increase the number of violent attacks by around 24%. This effect seems very large, but recall from Table 3 that the standard deviation of the unemployment rate is only two percentage points, compared with 12 percentage points for the level of opposition support. The unemployment coefficients in Tables 4-5 are insignificantly different from zero, so this effect appears to be specific to the type of rural constituency covered by the Sokwanele report. While it is possible to extend the model in Tables 4-5 to include *unemp* interacted with other district characteristics, this modification makes no substantial difference to the size or significance level of the *opp05* and *opp-dif* coefficients.

5. Summary and Conclusion

Evidence from Zimbabwe indicates that the geographical variation in the level of electoral violence instigated by the incumbent government is strongly negatively correlated with the strength of support for the opposition: where the opposition is strong, its activists appear better able to resist attack. Most attacks are carried out from bases manned by government party activists with only indirect connections to the state security apparatus, and it may be that the rudimentary equipment of these bases makes resistance feasible in areas of opposition strength.

These results raise a policy question: would greater international support for civil society groups with the capacity to protect civilians reduce electoral violence in countries like Zimbabwe? The effectiveness of such support will depend on two conditions. The first condition is that government party activists perpetrating violence do not redeploy resources from areas of strong resistance to areas of weak resistance. This condition appears to have been met in Zimbabwe in the recent past, since the correlation between opposition strength and violence per district is no larger than the correlation between opposition strength and violence per base. The second condition is that the government is either unwilling or unable to draw more heavily on the state security apparatus in order to maintain existing levels of terror in the civilian population. This will depend on the strength of government support among security service personnel, which is an area for future study.

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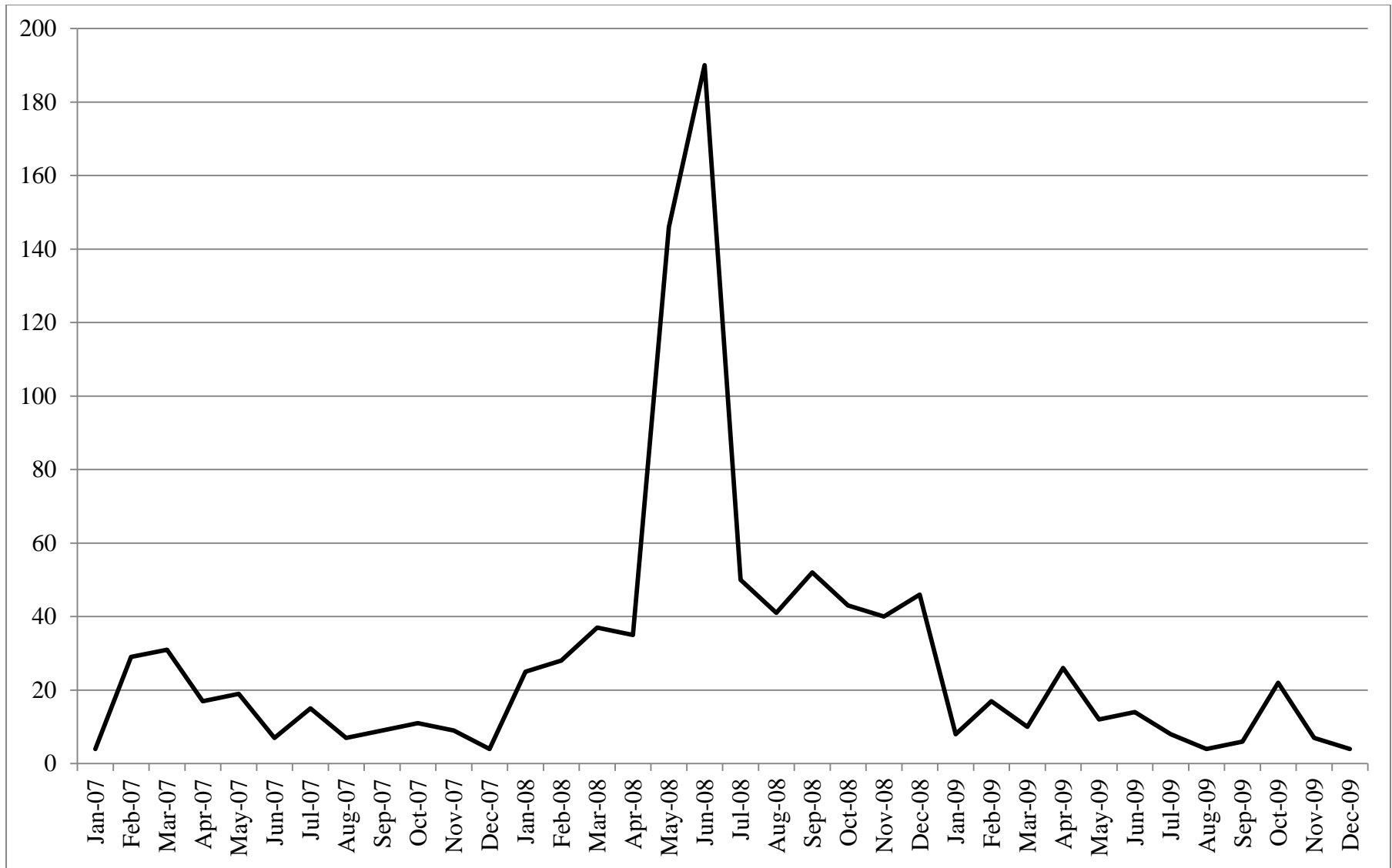


Figure 1: Total Monthly Attacks (Source: Armed Conflict Location and Event Data Project, Version 5)

Figure 2: Organisational Structure of Bases in the Maramba-Pfungwe Constituency (Source: Sokwanele, 2010)

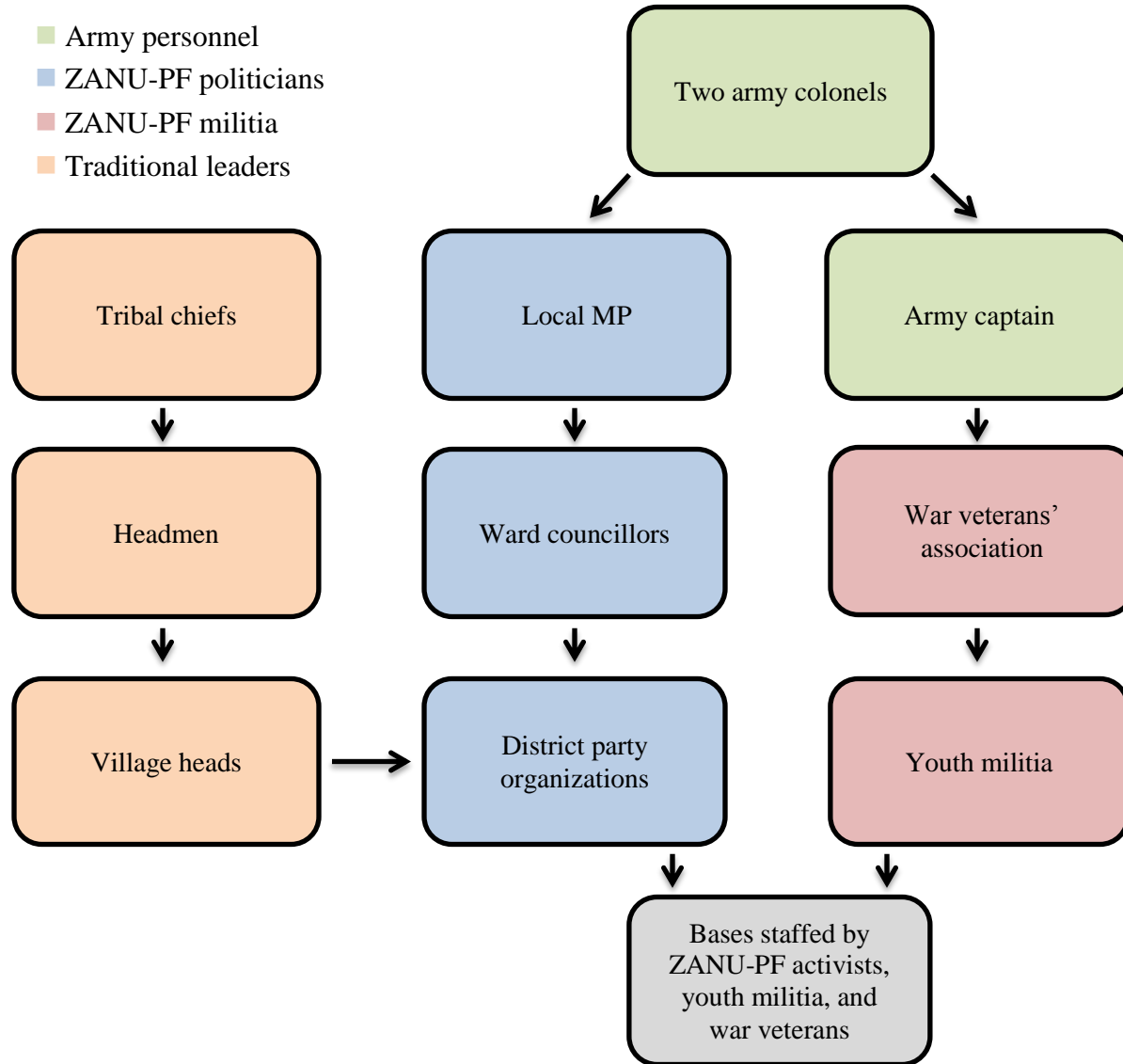


Table 1: Perpetrators of Violent Attacks in Zimbabwe over 2000-2014

(Source: Armed Conflict Location and Event Data Project, Version 5)

<i>Organization / Group</i>	<i>Number of Violent Attacks Perpetrated</i>
ZANU-PF activists	2,094
Militia connected to ZANU-PF	289
Unidentified groups	254
<i>Total of likely ZANU-PF attacks</i>	<i>2,637</i>
Zimbabwean Police Force	635
Zimbabwean Army	311
Central Intelligence Organization	76
<i>Total of state organization attacks</i>	<i>1,022</i>
MDC activists	187

Table 2: SUR Model of the Opposition Support in Each District

The sample comprises 90 districts.

	dependent variable: $\ln(opp05) - \ln(1 - opp05)$		dependent variable: $\ln(opp08) - \ln(1 - opp08)$	
	coeff.	<i>t ratio</i>	coeff.	<i>t ratio</i>
<i>intercept</i>	-4.009	-1.18	1.049	0.33
<i>urban</i>	-0.001	-0.31	0.001	0.48
<i>literacy</i>	0.060	1.65	0.008	0.24
<i>mortality</i>	-0.017	-3.66	-0.012	-2.81
<i>electricity</i>	-0.004	-0.91	-0.002	-0.49
<i>unemp</i>	0.036	4.72	0.030	4.30
R ²	0.43		0.39	

Table 3: Descriptive Statistics

	<i>districts sample (N = 90)</i>			<i>bases sample (N = 83)</i>		
	<i>mean</i>	<i>median</i>	<i>std. dev.</i>	<i>mean</i>	<i>median</i>	<i>std. dev.</i>
<i>vio in 2007</i>	1.81	0.00	11.6			
<i>vio in 2008</i>	8.16	2.00	18.6			
<i>vio in 2009</i>	1.53	0.00	4.29			
<i>vio in 2010</i>	1.26	0.00	2.16			
<i>vio-base</i>				13.3	7.00	17.3
<i>opp05</i>	69.7	70.2	11.5			
<i>opp08</i>	78.6	78.9	8.1	72.8	72.8	11.8
<i>opp-dif</i>	8.9	8.0	6.3			
<i>mdc-heads</i>				12.0	0.0	17.3
<i>ln(pop)</i>	11.5	11.6	0.84			
<i>urban</i>	34.1	3.50	45.1	2.61	2.80	1.65
<i>literacy</i>	95.7	96.0	2.39	93.7	94.0	1.60
<i>mortality</i>	63.6	63.5	11.5	72.5	74.0	9.05
<i>electricity</i>	37.5	25.7	29.4	17.1	10.4	10.6
<i>unemp</i>	11.6	10.8	7.74	3.89	4.08	2.14

Table 4: Negative Binomial Models of the Number of Attacks per District (*vio*) in Each Year

The sample comprises 90 districts.

	sample period = 2007				sample period = 2008				sample period = 2009				sample period = 2010			
	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>
<i>intercept</i>	-7.733	-1.85	-23.78	-1.48	-16.32	-5.91	-51.19	-4.52	-12.09	-2.64	-27.86	-1.68	-3.549	-1.25	6.651	0.70
I[<i>vio</i> ₋₁ > 0]	0.718	1.51	0.666	1.59	0.472	1.39	0.611	1.69	-0.573	-0.86	-0.750	-1.11	1.530	3.69	1.648	3.93
ln(<i>vio</i> ₋₁)	0.806	3.68	0.767	4.13	0.301	0.92	0.207	0.82	0.736	3.82	0.746	3.56	0.197	0.90	0.343	1.78
<i>opp05</i>	0.024	0.95	0.025	0.97	-0.072	-4.14	-0.065	-3.81	-0.050	-2.16	-0.059	-3.05	0.011	0.49	0.025	1.00
<i>opp-dif</i>	0.032	0.80	0.054	1.37	0.019	0.43	0.033	1.04	-0.069	-2.08	-0.066	-2.44	0.035	1.18	0.041	1.37
<i>urban</i>	0.006	0.93	-0.014	-1.73	0.016	3.85	0.015	2.61	0.015	2.46	-0.016	-1.62	0.004	0.99	0.016	2.55
ln(<i>pop</i>)	0.584	1.81	0.499	2.30	1.260	5.47	1.274	6.20	0.845	2.14	0.753	2.32	0.220	0.98	0.127	0.55
<i>literacy</i>			0.193	1.24			0.369	3.38			0.133	0.90			-0.077	-0.88
<i>mortality</i>			-0.024	-1.09			0.005	0.40			0.042	1.88			-0.015	-1.20
<i>electricity</i>			0.017	1.14			-0.017	-2.12			0.051	2.76			-0.017	-1.90
<i>unemp</i>			-0.014	-0.35			-0.040	-1.29			-0.004	-0.08			-0.035	-1.14
ln(α)	-1.201	-0.41	-18.91	-72.1	0.307	1.58	0.101	0.47	0.356	0.78	-0.299	-0.72	-0.708	-1.12	-0.981	-1.38
median <i>vio</i>		0.00				2.00				0.00				0.00		
mean <i>vio</i>		1.81				8.16				1.53				1.26		

Table 5: Negative Binomial Models of the Number of Attacks per District (*vio*) during 2008*

The sample comprises 90 districts.

	sample period = January-March				sample period = April-December				sample period = May-June				sample period = April, July-Dec			
	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>
<i>intercept</i>	-16.68	-4.87	-39.94	-2.99	-14.07	-5.40	-42.05	-3.70	-14.10	-4.86	-58.52	-4.34	-13.64	-5.19	-24.14	-2.26
I[<i>vio</i> ₋₁ > 0]	-0.009	-0.02	-0.116	-0.29	1.740	5.23	1.505	4.83	1.788	4.74	1.426	4.34	1.567	4.64	1.389	4.57
ln(<i>vio</i> ₋₁)	0.055	0.30	-0.036	-0.17	-0.040	-0.15	0.079	0.30	0.007	0.03	0.194	0.77	0.051	0.20	0.189	0.71
<i>opp05</i>	-0.036	-1.89	-0.034	-1.62	-0.059	-4.00	-0.061	-4.40	-0.062	-3.56	-0.076	-4.69	-0.052	-3.43	-0.045	-3.16
<i>opp-dif</i>	0.010	0.29	0.016	0.57	0.003	0.10	0.012	0.54	-0.002	-0.07	0.010	0.35	0.004	0.15	0.012	0.55
<i>urban</i>	0.011	2.54	0.005	0.75	0.015	4.21	0.010	1.59	0.013	2.84	0.007	1.16	0.015	4.58	0.019	2.54
ln(<i>pop</i>)	1.251	4.62	1.394	4.40	1.043	5.13	1.080	5.50	0.986	4.44	1.084	5.17	0.966	4.72	0.967	5.01
<i>literacy</i>			0.233	1.78			0.295	2.62			0.469	3.48			0.108	1.04
<i>mortality</i>			-0.003	-0.15			-0.002	-0.13			-0.016	-0.99			0.012	0.99
<i>electricity</i>			0.006	0.60			-0.008	-0.93			-0.018	-2.04			-0.008	-1.07
<i>unemp</i>			-0.056	-1.58			-0.026	-1.03			-0.032	-1.03			-0.032	-1.09
ln(α)	-0.588	-0.78	-0.993	-0.88	-0.226	-0.81	-0.370	-1.22	-0.051	-0.17	-0.282	-0.85	-0.673	-1.86	-0.907	-2.03
median <i>vio</i>			0.00				1.50				1.00				1.00	
mean <i>vio</i>			0.99				7.17				3.88				3.29	

* For January-March *vio*₋₁ is measured as *vio* in 2007; for other sample periods *vio*₋₁ is measured as *vio* in January-March.

Table 6: Random-Effects Poisson Models of the Number of Attacks per Base (*vio-base*)
in High-Violence Constituencies

The sample comprises 83 bases in 15 parliamentary constituencies; the sample period is 2008/2010.

	<i>coeff.</i>	<i>t-ratio</i>	<i>coeff.</i>	<i>t-ratio</i>
<i>intercept</i>	0.193	2.51	-0.482	-0.05
<i>opp08</i>	-0.059	-3.83	-0.061	-7.59
<i>mdc-heads</i>	-0.008	-0.82	-0.013	-2.54
<i>urban</i>	0.317	2.51	0.325	5.47
<i>literacy</i>			0.005	0.05
<i>mortality</i>			-0.008	-0.70
<i>electricity</i>			-0.019	-0.98
<i>unemp</i>			0.240	5.20
$\ln(\varphi)$	-1.262	-3.26	-3.086	-5.81
median <i>vio-base</i>		7.00		7.00
mean <i>vio-base</i>		13.33		13.33

Appendix 1

Table A1: Constituencies in the Bases Sample

The number of bases in each constituency is indicated in parentheses.

Buhera South (6)	Maramba-Pfungwe (6)	Mudzi North (12)	Shamva South (8)
Hurungwe North (2)	Mazowe North (4)	Mwenezi West (1)	Uzumba South (9)
Hwedza South (2)	Mt Darwin South (5)	Nyanga North (7)	Zaka West (7)
Makoni South (4)	Muzarabani North & South (10)		

Appendix 2: Merging District-Level and Constituency-Level Data

The statistical analysis reported in Tables 4-5 makes use of data on violence and socio-economic characteristics reported at the district level. Here, ‘district’ refers to the 90 distinct geographical areas used in the 2012 Census of Zimbabwe. Some of these census districts correspond to one of the 60 administrative districts of Zimbabwe, but others are sub-divisions of administrative districts, as elaborated in Table A2. The analysis in Tables 4-5 also makes use of voting figures reported at the parliamentary constituency level and aggregated to the district level. The 210 parliamentary constituencies are also sub-divisions of administrative districts, but not all constituencies are sub-divisions of census districts: some constituency and census district boundaries overlap. For the purposes of analysis, constituency voting figures are aggregated to the administrative district level. Hence, the variables $opp05_j$ and $opp08_j$ in equations (1-2) are measured as voting fractions for the administrative district of which census district j is a part.

Table A2: Census Districts and Corresponding Administrative Districts

<i>administrative district</i>	<i>census district</i>	<i>administrative district</i>	<i>census district</i>	<i>administrative district</i>	<i>census district</i>
Beitbridge	Beitbridge	Gutu	Gutu	Masvingo	Masvingo
Beitbridge	Beitbridge Urban	Gwanda	Gwanda	Masvingo	Masvingo Urban
Bikita	Bikita	Gwanda	Gwanda Urban	Matobo	Matobo
Bindura	Bindura	Gweru	Gweru	Mazowe	Mazowe
Bindura	Bindura Urban	Gweru	Gweru Urban	Mazowe	Mvurwi
Binga	Binga	Harare	Chitungwiza	Mberengwa	Mberengwa
Bubi	Bubi	Harare	Epworth	Mount Darwin	Mount Darwin
Buhera	Buhera	Harare	Harare	Mudzi	Mudzi
Bulawayo	Bulawayo	Hurungwe	Hurungwe	Murehwa	Murehwa
Bulilima	Bulilima	Hurungwe	Karoi	Mutare	Mutare
Bulilima	Mangwe	Hwange	Hwange	Mutare	Mutare Urban
Bulilima	Plumtree	Hwange	Hwange Urban	Mutasa	Mutasa
Chegutu	Chegutu	Hwange	Victoria Falls	Mutoko	Mutoko
Chegutu	Chegutu Urban	Hwedza	Hwedza	Muzarabani	Muzarabani
Chegutu	Norton	Insiza	Insiza	Mwenezi	Mwenezi
Chikomba	Chikomba	Kadoma	Kadoma Urban	Nkayi	Nkayi
Chimanimani	Chimanimani	Kadoma	MhondoroNgezi	Nyanga	Nyanga
Chipinge	Chipinge	Kadoma	Sanyati	Rushinga	Rushinga
Chipinge	Chipinge Urban	Kariba	Kariba	Seke	Seke
Chiredzi	Chiredzi	Kariba	Kariba Urban	Shamva	Shamva
Chiredzi	Chiredzi Urban	Kwekwe	Kwekwe	Shurugwi	Shurugwi
Chirumhanzu	Chirumhanzu	Kwekwe	Kwekwe Urban	Shurugwi	Shurugwi Town
Chivi	Chivi	Kwekwe	Redcliff	Tsholotsho	Tsholotsho
Gokwe North	Gokwe North	Lupane	Lupane	Umguzo	Umguzo
Gokwe South	Gokwe South	Makonde	Chinhoyi	Umzingwane	Umzingwane
Gokwe South	Gokwe South Urban	Makonde	Makonde	UMP	UMP
Goromonzi	Goromonzi	Makoni	Makoni	Zaka	Zaka
Goromonzi	Ruwa	Makoni	Rusape	Zvimba	Zvimba
Guruve	Guruve	Marondera	Marondera	Zvishavane	Zvishavane
Guruve	Mbire	Marondera	Marondera Urban	Zvishavane	Zvishavane Mine