

From Rebellion to Electoral Violence

Evidence from Burundi*

Andrea Colombo[†], Olivia D'Aoust[‡], Olivier Sterck[§]

December 2014

Abstract

We aim at understanding the triggers of electoral violence, which affected 80% of elections in Africa during the last decades. We focus on Burundi, a country where polls were organized in 2010, only few months after the end of a long-lasting civil war. We find that an acute polarization - capturing the presence of groups with equal support - between ex-rebel groups and political competition are both highly conducive to electoral violence. Disaggregating electoral violence by type, we show that these drivers explain different types of violence. Perhaps surprisingly, we find that ethnic diversity is not associated with electoral violence in post-conflict Burundi. These results are robust to numerous specifications. We therefore argue that policies supporting the transition of ex-rebel groups from warfare to the political arena should be reinforced.

Keywords: Civil war, Electoral violence, Polarization, Demobilization, Burundi

JEL Classification: D74, O11, O17, O55

*We thank Amatora Mu Mahoro Ushahidi, the International Foundation for Electoral Systems (IFES) and H el ene Helbig de Balzac for the data on electoral violence. We also acknowledge the kind institutional collaboration of the Afrobarometer. We are grateful to Tom Bundervoet, Katarzyna Cieslik, Paul Collier, Catherine Dehon, Bram De Rock, Victor Ginsburgh, Antonio Estache, James Fenske, Anke Hoeffler, Nastassia Leszczynska, Edward Miguel, Davy Paindaveine, Cyrus Samii and Philip Verwimp and to participants at the 2014 AGW, CSAE, IEA, NCDE and SSDev conferences, at the ECARES internal seminar, ULB, the UC Berkeley development lunch, and the CSAE research workshop for useful comments and discussions. All remaining errors are ours.

[†]Universit e libre de Bruxelles (SBS-EM, ECARES)

[‡]Universit e libre de Bruxelles (SBS-EM, ECARES), FNRS. Olivia D'Aoust acknowledges financial support from the Fonds National de la Recherche Scientifique (FNRS).

[§]University of Oxford (CSAE)

1 Introduction

“Democratic governance – by protecting minorities, encouraging political pluralism, and upholding the rule of law – can channel internal dissent peacefully, and thus help avert civil wars. Conversely, authoritarian and highly personalized forms of governance, ethnic discrimination, human rights violations and corruption are among the root causes of many of today’s internal conflicts.”

U.N. Secretary-General Kofi Annan (2000)¹

Promoting democratization and elections has been at the core of peace-building missions in post-conflict societies since the end of the Cold War. Early post-war elections should indeed increase legitimacy and accountability of the newly emergent governments and foster social trust in war-torn societies, thus contributing to long-lasting peace and sustainable development (Soudriette and Pilon 2007; Reilly 2002). Nonetheless, elections failed to be implemented properly in a vast majority of post-conflict countries in Africa. During the 1975-2011 period, 80% of African polls were spoiled by violence, bribery, intimidation or inequitable government interference, compared to 40% in non-African countries (Bishop and Hoeffler 2014). Developing a better understanding of the causes of failed elections, and more generally democratic transitions, is all the more important in view of their devastating effects on the living conditions of civilians (Dupas and Robinson 2012, 2010; Omotola 2010). By undermining the legitimacy of the states (Berman *et al.* 2014) and destroying social capital within societies (Dercon and Gutiérrez-Romero 2012), failed transitions further translate into poor economic and political performance (Collier and Hoeffler 2013; Kudamatsu 2012; Chauvet and Collier 2009) and can ultimately plunge the country back into war (Brancati and Snyder 2012; Hegre *et al.* 2001; Henderson and Singer 2000).

In which context is electoral violence likely to emerge? On the one hand, a large literature studied how ethnic grievances may foster violence. Popular resentment is likely to be exacerbated as elites have been shown to exploit ethnic allegiances during electoral periods to seize political power (Wilkinson 2004; Eifert *et al.* 2010). On the other hand, economists have shown theoretically that electoral violence may be an optimal strategy for political actors, depending on their position (incumbent versus opponent), their relative strength and their support among the population (Collier and Vicente 2012; Robinson and Torvik 2009; Chaturvedi 2005; Ellman and Wantchekon 2000). Taking into account differences in institutional quality, Hafner-Burton *et al.* (2013) propose a cross-country empirical analysis supporting these theoretical mechanisms: political groups perceived as weaker tend to be more violent in trying to win elections.

¹Quote from the address delivered by Secretary-General Kofi Annan in Warsaw at the International Conference: “Towards a Community of Democracies”.

In this chapter, we show empirically that the exploitation of ethnic belonging and political competition are not sufficient for triggering electoral violence. For political competition to turn violent, the presence of local perpetrators is necessary. These can be “hardcore supporters”, to use the terminology of Collier and Vicente (2012). Demobilized rebels, whose factions often became political parties after civil war, are good candidates for such role during electoral campaigns. As such, they might be more likely to resort to violence and rely on non-democratic persuasion tools, hence undermining the conduct of free and fair elections. We test this theory in the context of the 2010 electoral cycle in Burundi and find that polarization between ex-rebel groups - capturing the presence of groups with equal support - is associated with more electoral violence. Our study highlights the involvement of ex-combatants in the spreading of violence. In particular, we show that a one standard deviation increase in polarization among rebel groups lead to an increase of 38% of violent events. Namely, going from the lowest polarized municipality in Burundi to the highest one, we predict a four-fold increase in the incidence of violent events.

Interestingly, political competition between parties also matters. When desegregating electoral violence by type, we find that political and demobilized rebels’ competition explain different types of event. In particular, political fractionalization is significantly associated with targeted violence, such as arbitrary detention or murder while demobilized rebels’ polarization is causing more clashes and destruction of properties.

In contrast, we find that the acclaimed Hutu-Tutsi antagonism does not seem to have had an impact on incidence of electoral violence. Our results suggest that the triggers of electoral violence in Burundi have disengaged from their original inter-ethnic roots. Electoral violence was higher in municipalities with a larger proportion of Hutu, which suggests that tensions became anchored in the intra-Hutu rivalry, manifested by Hutu ex-rebels groups and political parties competing to seize power. Our study concludes that demobilization programs alone may not be enough to prevent the resurgence of violence. Policies to facilitate the transition from rebellion to political competition are much needed.

Our study contributes to two strands of the literature. First, we complement the few existing micro-quantitative studies on electoral violence. Dercon and Gutiérrez-Romero (2012) use micro-level data from Kenya to study electoral violence that erupted in 2007. They find that violence emerged in areas prone to land disputes and with politically connected gangs. In the same context, Gutiérrez-Romero (2012) finds that political parties engaged in vote-buying in areas where they were less likely to win, in order “to weaken the support of their political rivals and to mobilize their own”. Complementing these results, Collier and Vicente (2013) recently evaluated a randomized anti-violence community campaign in Nigeria. They find that the intervention decreased the intensity and the violence-related perceptions and increased turnout. Fafchamps and Vicente (2013)

further show that the effects of the campaign were also transmitted indirectly through kinship and geographical proximity. Our empirical investigation complements this scarce literature by focusing on a post-conflict context and by directly studying the long-term impact of Burundi's civil war on post-conflict elections. This focus is particularly relevant since conflict-affected countries have been shown to be more likely to return to war (Collier 2008).

Importantly, our study also contributes to the body of research that assesses the effectiveness of demobilization programs in post-conflict societies (D'Aoust *et al.* 2013; Gilligan *et al.* 2013; Verwimp and Bundervoet 2009; Humphreys and Weinstein 2007, 2005). To our knowledge, our study is the first empirical analysis that evaluates the impact of ex-combatants demobilization on violence outbursts' recurrence. More generally, we claim that understanding the causes of electoral violence is an important preliminary step before implementing and assessing policies aiming to reduce these misconducts.

This chapter is organized as follows. Section 3 describes the dataset and the econometric methods used in the empirical analysis. Results are presented in Section 4 and are discussed in Section 5. Section 6 concludes.

2 Historical background

After obtaining independence from Belgium in 1961, the political situation in Burundi has been unstable and disrupted by recurrent episodes of violence between the country's two major ethnic groups, the majority Hutu and the minority Tutsi². After a short democratic transition, a group of Tutsi officers seized power in 1966 after contested elections won by the Hutu majority. From 1966 to 1988, three Tutsi presidents from the same party³ and the same village in the Southwestern province of Bururi governed the country and violently repressed any Hutu rebellion (Lemarchand 1998; Falch 2009).

From 1988, under the pressure of the international community, a democratization process was initiated. The new constitution introducing multiparty competition after 20 years of Tutsi regime, allowed Melchior Ndadaye, from the Hutu-based party FRODEBU⁴, to triumph in 1993 elections. Despite the new government based on power-sharing across ethnic groups, the assassination of Ndadaye by Tutsi officers and the death of the *ad interim* President Cyprien Ntaryamina in the 1994 plane crash, triggered a civil war opposing the Tutsi-controlled army and radical Hutu groups (Prunier 2009). The already doomed democratization process was definitely buried in July 1996, when the Tutsi-controlled army lead by former Tutsi president Buyoya overthrew the power-sharing gov-

²According to the Afrobarometer survey in 2012, the Hutu and the Tutsi represented 82% and 17% of the population respectively. A third group, the Twa, was reported to account for less than 1% of the population.

³The UPRONA, Union pour le Progrés National

⁴Front pour la Démocratie du Burundi (FRODEBU).

ernment.

A fragile peace was reached through the Arusha Peace and Reconciliation Agreement on August 28, 2000. The two largest Hutu rebel groups, the CNDD-FDD and the FNL-Palipehutu⁵ indeed rejected the peace accords and kept on fighting the government of transition. The CNDD-FDD eventually signed a Comprehensive Ceasefire Agreement in 2003 and joined the power-sharing government. Combatants from the national army (FAB) and from the CNDD-FDD were selected to form the new *Forces de Défense de la Nation* (FDN). Those who did not fulfil selection criteria based on age, health status and experience were demobilized according to a “Disarmament, Demobilization and Reinsertion” (DDR) program: approximately 23,000 units from both sides spent a week attending training on economic opportunities, HIV/AIDS, civil responsibility, as well as peace and reconciliation (D’Aoust *et al.* 2013; Gilligan *et al.* 2013). Then, they benefited from a sequence of reinsertion and reintegration grants in order to be able “to return to their community and to sustain themselves and their families for a limited period following demobilization” (World Bank 2004).

The CNDD-FDD won the elections held in 2005 and its leader, Pierre Nkurunziza, became President. Despite the appointment of a Hutu exponent as head of the country, the FNL-Palipehutu kept on fighting the government, definitely transforming what had been an inter-ethnic war into a Hutu-against-Hutu conflict. After a first attempt of ceasefire agreement in 2006, the FNL-Palipehutu finally accepted to give up its weapons and turned into a political party in 2009. Minor administrative posts were attributed to the FNL leadership. As for the CNDD-FDD four years earlier, its combatants either joined the national army or benefited from the DDR program.

Elections were scheduled in 2010, only few months after the official epilogue of the civil war. Five consecutive ballots were organized, starting with the election of municipal representatives on May 24, 2010, followed by the presidential election on June 28, the parliamentary and senatorial elections at the end of July, and ending with the election of the hills’ representatives early September. Even if several opposition parties seemed confident in their success (ICG 2011), the FNL party was seen as the most serious opposition to the CNDD-FDD of the incumbent president Pierre Nkurunziza.

The pre-electoral climate was spoiled by numerous violent episodes, claims of intimidation and suspicions of fraud. In such a context, the CNDD-FDD party won the first municipal ballot outright, catching 64% of votes and 62% of seats in municipal assemblies. The FNL ended up as the second largest force, with only 14% of the votes. FRODEBU and UPRONA obtained 5 and 6% of the votes respectively. The international community recognized the electoral results to be free and fair. Nevertheless, the resounding defeat pushed the opposition parties to boycott the four following ballots, accusing Nkurunziza

⁵Conseil National de Défense de la Démocratie - Forces de Défense de la Démocratie (CNDD-FDD). Forces Nationales de Libération (FNL-Palipehutu).

of massive frauds and irregularities (Vandeginste 2012; ICG 2011). Opposition parties withdrew their candidacy for other ballots, leaving Nkurunziza as the only candidate running for presidency (Helbig de Balzac *et al.* 2011). The incumbent president was re-elected with 95% of the preferences. Violence continued to be pervasive until the end of the electoral process.

The 2010 elections have legitimized a quasi-return to single-party rule, the CNDD-FDD having obtained a three-quarters majority in the National Assembly. Political tensions have therefore mounted, leading to the resurgence of rebel groups - among which the FNL - aiming to fight the government (ICG 2012). Many opposition leaders have left the country after complaining about constant harassment and threats to their lives. Several of those who remained politically active have been arrested or assassinated. Media and civil society have been threatened, increasing the risk of instability and insecurity (Vandeginste 2012). In such volatile context, the country will be going through a new electoral round in 2015.

3 Identification strategy

Our paper aims at understanding the roots of the violence that perturbed the electoral process in Burundi in 2010. In line with the literature on electoral violence, we study how ethnic grievances and political competition had an effect the likelihood of electoral violence. We additionally argue that these factors are not sufficient to trigger certain types of violent confrontations during elections. In particular, we examine the role played by demobilized rebel groups. Demobilized rebels may have caused turmoil during the electoral period for two reasons. First, previous literature suggests that demobilized soldiers are active in the post-war political life of the country (Gilligan *et al.* 2013; Annan *et al.* 2011; Goose and Smyth 1994). Second, most rebel groups turned into political parties after being demobilized. Competition between these “hard core supporters” is likely to have driven electoral violence, as these actors might be more likely to engage in violence given their past histories.

We therefore propose to estimate the following model:

$$\begin{aligned}
 \text{Violent episodes}_m &= \alpha_m + \gamma_1 \text{ demob. rebels' polarization}_m & (1) \\
 &+ \gamma_2 \text{ demob. rebels' fractionalization}_m \\
 &+ \beta_1 \text{ Hutu share}_m + \beta_2 \text{ ethnic fractionalization}_m \\
 &+ \phi_1 \text{ political competition}_m + \mathbf{X}'_m \delta + Z_k + \epsilon_m,
 \end{aligned}$$

where $\text{Violent episodes}_m$ is the number of episodes of electoral violence which occurred in each municipality $m \in [1, 129]$. Hutu share_m and $\text{ethnic fractionalization}_m$ aim to capture

ethnic heterogeneity. $Political\ competition_m$ measures the political heterogeneity calculated along fractionalization and polarization indexes based on 2010 municipal elections' results. To avoid biases due to reverse causality, we instrument it with the 2005 election results, as explained in more details in the next section. \mathbf{X}_m is a vector of covariates which includes municipalities' number of hutu demobilized soldiers per 1000 inhabitants, median wealth, population, population density, past violence, and Z_k are fixed effects⁶.

3.1 Data

Electoral violence The different measures of electoral violence are constructed using the Burundi *Ushahidi* electoral violence dataset. The *Ushahidi* ("testimony") software has been developed to map reports of violence in Kenya after the post-election fallout in 2007-2008. It was then adapted to Burundian context through the *Amatora mu Mahoro* (translated "Elections in Peace") project. It also draws on the Elections Violence Education and Resolution (EVER) methodology, which gathers information on incidents of violence and peace activities and was conducted in a dozen countries since 2003 (IFES 2010). During the 2010 electoral process in Burundi, 450 trained monitors, on average 3.5 per municipality, verified and recorded electoral violence incidents. To be recorded, these incidents had to be reported to monitors by at least two official sources, and in most cases one eye witness. Information about physical violence, destruction of property, clashes between groups and intimidation during the electoral cycle were recorded between April, 26 to September 12, 2010.

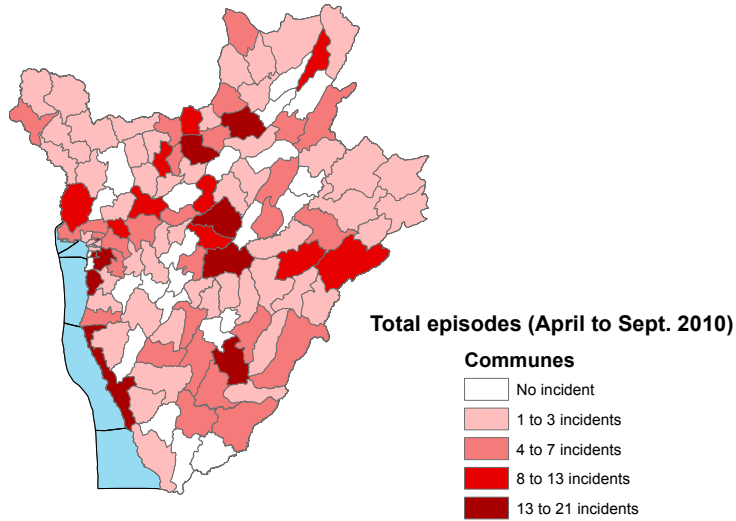
Our analysis proceeds in two steps. We first consider an aggregate measure of electoral violence as a dependent variable. In a second step, we study disaggregated measures distinguishing the nature and the timing of electoral violence. The top of Table 1 summarizes the main components of the dependent variable. The geographical distribution of the total number of episodes is additionally presented in figure 1. We do not observe evidence of spatial correlation in the dependent variable.

⁶Past violence, population and population density are expressed in log given their high dispersion. The indexes of ethnic, political and ex-soldiers' fractionalization, the indexes of political and demobilized combatants' polarization, as well as the wealth index are standardized.

Table 1: Summary Statistics

	Mean	St. Dev.	Min	Median	Max	N
Violent episodes						
Total	4.02	4.52	0.00	3.00	21.00	129
Clashes	0.59	1.25	0.00	0.00	9.00	129
Destruction	0.48	0.82	0.00	0.00	4.00	129
Intimidation	1.82	2.37	0.00	1.00	10.00	129
Detention	0.33	0.74	0.00	0.00	5.00	129
Threat	0.28	0.64	0.00	0.00	4.00	129
Attempted murder	0.36	0.76	0.00	0.00	5.00	129
Murder	0.16	0.61	0.00	0.00	5.00	129
Demobilized rebels						
Demobilized rebels' polarization	0.58	0.18	0.00	0.60	1.00	129
Demobilized rebels' fractionalization	0.54	0.16	0.00	0.58	0.78	129
Total no. demobilized rebels (/1000)	2.13	2.13	0.14	1.43	12.72	129
CNDD-FDD	53.29	61.08	0.00	35.00	350.00	129
CNDD	10.64	35.76	0.00	2.00	348.00	129
Palipe Agazika	4.48	11.66	0.00	0.00	74.00	129
Frolina	4.19	20.09	0.00	0.00	208.00	129
KAZE-FDD	2.80	6.23	0.00	1.00	58.00	129
FNL Icanzo	2.16	8.16	0.00	0.00	74.00	129
FNL - Rwasa	46.74	55.61	1.00	29.00	275.00	129
FNL Dissidents	12.36	37.42	0.00	3.00	326.00	129
Ethnic cleavages						
Hutu share	0.81	0.14	0.47	0.84	0.98	129
Ethnic fractionalization	0.27	0.14	0.03	0.27	0.50	129
Political competition						
2010 Political fractionalization	0.50	0.18	0.15	0.47	0.81	129
2010 Political polarization	0.44	0.13	0.15	0.43	0.87	129
2005 Political fractionalization	0.48	0.18	0.08	0.49	0.83	129
2005 Political polarization	0.48	0.17	0.08	0.50	0.92	129
Other covariates						
Median Wealth Index	-15143.45	91514.16	-55170.00	-41003.50	545314.50	128
Total violence (1997-2009)	20.40	37.68	0.00	9.00	357.00	129
Attacks on civilians (1997-2009)	10.97	21.09	0.00	3.00	177.00	129
Battles (1997-2009)	9.43	18.12	0.00	5.00	180.00	129
Population (2008 census)	62430.81	26454.23	17481.00	57284.00	155005.00	129
Population Density	1234.52	4173.98	72.34	351.49	33830.71	129

Figure 1: Distribution of electoral violence



Ethnic cleavages. Ethnicity is a sensitive matter. It is therefore challenging to obtain ethnic data either because it is not collected anymore or because it is not released. According to the Belgian census of 1959, three ethnic groups coexist in Burundi: the Hutu (85%), the Tutsi (14%) and the Twa (1%). Data from this census is only available at the national level.

The Afrobarometer survey did however collect and release data on ethnicity in its 2012 wave in Burundi. The survey is representative at the province level. We will thus proxy ethnic composition by taking the average proportion of Hutu at the province level. Given the low number of individuals interviewed in sampled municipalities⁷, an indicator of ethnicity computed at the municipal level would indeed suffer from a mismeasurement problem, leading to attenuation bias (Hausman 2001). Descriptive statistics in Table 1 show that the Afrobarometer figure for the proportion of Hutu - 81% - is close to the 85% reported in the 1959 Belgian census.

We use two indicators in order to capture ethnic tensions. First, we proxy for the proportion of Hutu at the provincial level using the Afrobarometer data. Second, we constructed an index of ethnic fractionalization following Alesina *et al.* (2003):

$$\text{Ethnic Fractionalization}_m = \sum_{i=1}^N (1 - \pi_i) \pi_i \quad (2)$$

where π_i is the proportion of people belonging to ethnic group i . The index of ethnic fractionalization can simply be interpreted as the probability that two randomly selected individuals from a given municipality belong to a different ethnic group⁸.

⁷The survey has data available for 111 out of 129 municipalities. In each municipality, between 8 and 32 individuals were interviewed

⁸In our sample, $N=2$. The formula thus becomes: ethnic frac. = $2\pi_i(1 - \pi_i)$. In this case, fractionalization and polarization indexes are proportional.

Political competition. We use results from the 2010 municipal elections to construct indexes of political fractionalization and polarization. The former is constructed according to equation (2) and can be interpreted as the probability that two randomly selected individuals from a given municipality had voted for a different party in the municipal elections.

For the index of political polarization, we slightly modify the Garcia-Montalvo and Reynal-Querol (2005)'s index of polarization by considering the absolute rather than the quadratic value of the term in the sum. By doing so, we avoid to put excessive weights on outlying municipalities⁹:

$$\text{Political polarization}_m = 1 - \sum_{i=1}^N \left| \frac{0.5 - \pi_i}{0.5} \right| \pi_i \quad (3)$$

where π_i is the proportion of votes obtained by each party. The index captures how far the political distribution is from being bipolar, with *Political polarization*_m = 1 indicating a bipolar political scenario.

Estimates could potentially suffer from reverse causality bias because the measures of political competition are based on the results of the municipal election in 2010. Electoral violence that occurred before the municipal election may have impacted voting behavior in a non-random way such as to affect indexes of political competition. To prevent this source of bias, we will use the results of the 2005 municipal elections to instrument for political competition in 2010. Figure 2 shows the predictive power of instruments for the 2010 indexes in bivariate scatter plots. The F-rest associated with these bivariate correlations are equal to 306 for political fractionalization and 88 for political polarization, showing that instruments are unlikely to be weak. This diagnosis is confirmed by F-tests on excluded instruments and Kleibergen-Paap F-tests.

Demobilized rebels' fractionalization, polarization and density. We constructed fractionalization (equation (2)) and polarization (equation (3)) indexes based on ex-rebels' affiliations. We use data from official registers containing information on the return of approximately 30,000 combatants from 10 armed groups demobilized between 2004 and 2009¹⁰. We also control for the number of demobilized rebels per municipality per 1000 inhabitants.

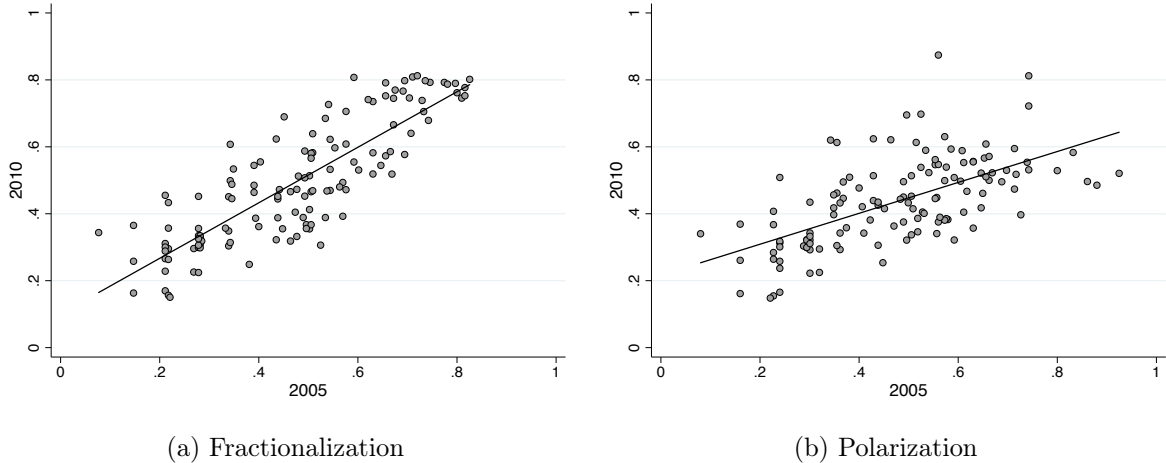
Most of the rebels were demobilized from the traditionally Hutu CNDD-FDD, led by the incumbent President, Pierre Nkurunziza (12,000 demobilized soldiers)¹¹. The second

⁹Similar results (not shown) are obtained with the Garcia-Montalvo and Reynal-Querol (2005)'s original index.

¹⁰The National Commission for Demobilization, Reinsertion and Reintegration kindly shared the data.

¹¹It should be noted that most of the demobilized soldiers come from the former national army (FAB) and the current national forces of defense (FDN) (13,000 demobilized soldiers). Nevertheless, since FAB did not turn into a political and its soldiers may be affiliated to different political group, we exclude

Figure 2: 2010 vs. 2005 Political Competition



largest group was the FNL-Palipehutu, whose leader is Agathon Rwasa, Nkurunziza’s main opponent. The remaining 4,500 demobilized ex-combatants are shared among the remaining six Hutu rebel groups. Summary statistics are shown in Table 1.

Other covariates We computed a median wealth index for each municipality from the household data from the 2010 Demographic and Health Survey (DHS)¹². The DHS wealth index uses information on household’s ownership of assets (e.g. bicycle and radios), environmental conditions and housing characteristics (e.g. type of water source, sanitation facilities, materials used for housing construction) and uses a principal components analysis to assign weights to the different components of the index (Rutstein and Johnson 2004). We control for the history of violence experienced by the municipalities from 1997 to 2009 by relying on the Armed Conflict Location & Event Data (ACLED) dataset. ACLED contain records on 2669 events, among which battles and attacks against civilians¹³, which occurred throughout Burundi from 1997 to 2009 (Raleigh *et al.* 2010). Data on population size and density are based on the last available census, conducted in 2008 by the *Institut de Statistiques et d’Etudes Economiques du Burundi* (ISTEEBU).

3.2 Estimation method

Given the count and non-normal nature characterizing the occurrence of electoral violence, Hilbe (2011) recommends estimating equation (1) with Poisson or Negative Binomial models. A Poisson distribution assumes that the mean and the conditional variance of the dependent variable are equal. This assumption does not hold for the distribution

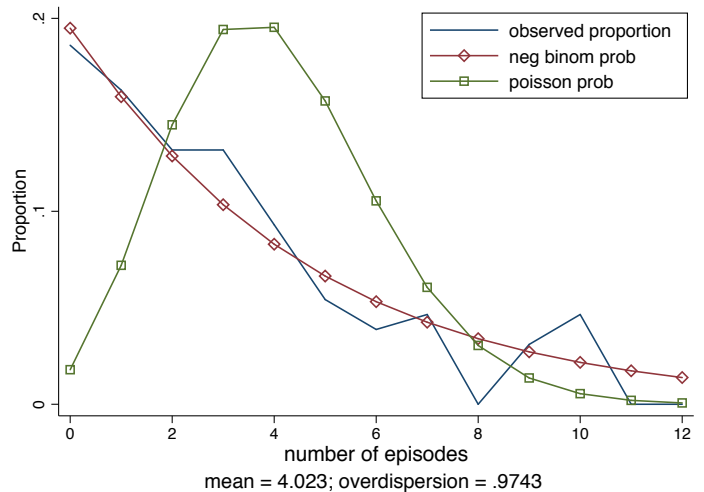
these demobilized soldiers from the main analysis. We only consider demobilized rebels.

¹²The survey was conducted in 128 municipalities (out of 129). Sampling weights were accounted for.

¹³Battles are “violent interaction between two politically organized armed groups at a particular time and location”. We excluded non-violent events, riots and protests.

of violent episodes which is overdispersed. Its conditional variance is 20.414, which is five times higher than its conditional mean (4.023), indicating overdispersion in the data. This diagnosis is confirmed by chi-square goodness-of-fit tests which strongly reject the null hypothesis that the data follow a Poisson distribution (p -value = 0.00). Given strong overdispersion in the dependent variable, we prefer to use a negative binomial regression model (Hilbe 2011). The model specification is validated by Pearson’s dispersion tests and the link tests. Figure 3 plots the distribution of violent episodes against a Poisson distribution and a Negative Binomial distribution with the same mean and variance. It further confirms how the latter performs better than the former in explaining the data on electoral violence. OLS and Poisson estimates are nonetheless presented in Appendix, and give similar results.

Figure 3: Goodness of fit of Negative Binomial and Poisson models



We undertake a matching exercise between neighboring municipalities to minimize the risk of omitted variable bias. We do so by constructing a database that identifies each neighborhood of municipalities by a dummy variable, that we then include as fixed effects in the regressions. These “geographic” fixed effects should capture unobserved characteristics that are common among neighboring municipalities. This approach relies on the assumption that neighboring municipalities¹⁴ are likely to be similar. This assumption is valid if unobservables characteristics are geographically distributed and if borders between municipalities are exogenous enough such that there are no important differences between neighboring municipalities’s unobservables characteristics (Huillery 2009).

We rely on three definitions of neighborhood to compute the fixed effects that are included in the model. Let $m \in [1, M]$ be a municipality. N_m being the set of neighbors of m and $n \in N_m$ being one particular neighbor of m .

¹⁴Neighboring is defined as sharing a common border.

All pairs. We constituted a new dataset by matching each municipality m with each of its neighbors. Municipalities have between 3 and 11 neighbors. This dataset contains 1404 observations, that is, 702 pairs of neighbors. Each pair is identified by a dummy. We then estimated equation (1) by including pair fixed effects. Since municipalities have many neighbors and are neighbors of many other municipalities, standard errors are clustered at three levels (Cameron *et al.* 2011). The first level is the neighborhood. The second level accounts for the fact that each municipality may be the neighbor of several other municipalities. The third level captures the fact that municipalities have duplicates in the sample.

Neighborhood. The second matching procedure proposes to replace the pair fixed effects included in equation (1) by neighborhood fixed effects. We define the neighborhood of municipality m as its set of neighbors N_m plus the municipality itself. We constructed a dataset listing all municipalities of the 129 neighborhoods, each neighborhood being then identified by a dummy variable. We then re-estimated equation (1) by including these neighborhood fixed effects. The estimation of this specification requires clustering standard errors at two levels to account for the fact that municipalities have multiple neighbors and are neighbors of multiple municipalities.

Random pairs. The third method uses the same sample as the “all pairs” fixed effects method. However, instead of considering all pairs of neighbors simultaneously, we constituted a subsample of pairs by matching each municipality m with one of its neighbor, selected randomly. We then estimated equation (1) using this sample of $2 \times M$ observations. To avoid the effect being driven by particular neighborhood designs, we repeated the sampling procedure and re-estimated the regression 200 times. We will report the average of estimated coefficients and standard errors. As the same municipality can appear within different pairs, we clustered standard errors at the municipal level.

4 Results

In this section, we first examine how our aggregated measure of electoral violence correlates with competition between demobilized rebels, ethnic grievances and political competition. Then, in Section 4.2, we argue that these correlations can be interpreted as causal. We further check the robustness of our results in Section 4.3.

4.1 Benchmark results

In Table 2, we explore the three hypotheses that we think have driven electoral violence. Neighborhood fixed effects are included in these specifications. As will be shown in Table

3, our results are not affected by the type of matching used.

Columns (1) to (3) examine if competition between ex-rebel groups had an impact on electoral violence. In columns (1) and (2), polarization and fractionalization indexes are considered separately. In column (3), both demobilized rebels' polarization and fractionalization indexes are included in the model. The coefficient associated with the polarization index is positive and significant at the 1% threshold. An increase of one standard deviation in demobilized rebels' polarization induces a 38% increase in the number of episodes of electoral violence¹⁵. On the contrary, the coefficient associated with the rebels' fractionalization index is small and not significant. These results suggest that ex-rebel groups have been more likely to participate in electoral violence when competing with another group of similar size.

In columns (4) to (6), we assess if the ethnic composition of municipalities is correlated with the occurrence of electoral violence. From column (4), the Hutu share seems to be positively correlated with electoral violence. The coefficient is large, but the relationship is not significant at conventional levels (p-value = 0.10). This coefficient becomes significant when controlling for political competition. It is likely to be underestimated if an indicator of political competition is omitted. Indeed, the coefficient associated with the proportion of Hutu is likely to be downward biased when political fractionalization is omitted, as political fractionalization is positively correlated with electoral violence and negatively correlated with the proportion of Hutu.

Ethnic diversity, measured by ethnic fractionalization, has no impact on electoral violence. While existing studies point out at ethnic grievances to explain violence in post-colonial Burundi, our results suggest that this explanation is irrelevant for explaining electoral violence which occurred during the 2010 electoral process. Importantly, the positive correlation between ex-rebels' polarization and electoral violence is not significantly affected by the inclusion of ethnic composition indexes.

The relevance of political competition is examined in columns (7) to (12). As explained in Section 3.1, indexes of political competition are based on the results of the 2010 municipal elections. Reverse causality could potentially bias our estimates if electoral violence changed voting patterns, and hence affected our measures of political competition in a non-random way. To prevent this problem, we instrument our indexes of political competition in 2010 with the same indexes computed using the results of the 2005 elections. The Kleibergen-Paap F-statistic for weak identification are large enough to satisfy a minimum correlation between the endogenous variable and its instrument (columns (8), (10) and (12)), and are higher when we only consider polarization or fractionalization in 2005 indexes as instrument for their 2010 counterparts. Since we estimate equation (1) with a negative binomial regression model, our IV strategy is a control function approach, in

¹⁵For interpreting the results of the negative binomial regressions in percentage terms, one should take $\exp^\beta - 1$.

which we include the residuals from the first stage and their squared value in the second stage (Hilbe 2011; Wooldridge 2010).

Political fractionalization and political polarization indexes seem to have a positive effect on electoral violence when they are considered separately. However, when both indicators are included in the regression, it is the index of political polarization that captures most of the effect when these indexes are not instrumented. When considering the IV strategy, it is the index of political fractionalization that captures the largest part of the effect. This phenomenon can be explained by multicollinearity between political polarization and fractionalization. The correlation between these two variables is 0.65. In the IV regression (column (12)), the variance inflation factors (VIF) associated with polarization and fractionalization indexes are equal to 7.3 and 6.1 respectively, which indicates a risk of multicollinearity (i.e. they capture the same phenomenon). Multicollinearity does not reduce the predictive power of the model.

Importantly, the effect of ex-rebels' polarization is not significantly affected by the inclusion of any of the indexes of political competition. The correlation between the demobilized rebels' indicators and political competition is close to zero, suggesting that these indicators capture different mechanisms. In what follows, we will focus on the political fractionalization index. The relation between political fractionalization in 2005 and in 2010 is stronger, pushing the F-test upwards, which makes it a better instrument. Note that the results are not significantly affected if political polarization is considered instead (as shown in Table 8 in Appendix). If we instrument both political polarization and fractionalization, the coefficients are not significantly different but are less precisely estimated (Table 9 in Appendix).

Table 2: Demobilized rebels, ethnic, political diversity, and electoral violence

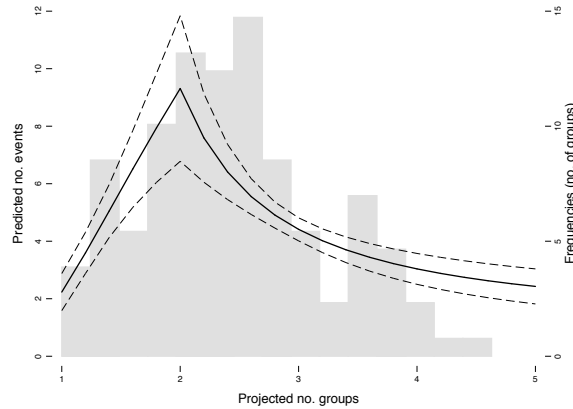
	<i>Dependent variable: total episodes of electoral violence</i>											
	Competition demob. rebels			Ethnic grievances			Negbin			Political competition in 2010		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Demob. rebels' polarization (st.)	0.255*** (0.086)		0.323*** (0.114)	0.342*** (0.113)	0.330*** (0.116)	0.343*** (0.112)	0.293** (0.115)	0.325*** (0.110)	0.290** (0.116)	0.253*** (0.112)	0.293** (0.115)	0.295*** (0.113)
Demob. rebels' fractionalization (st.)		0.124 (0.083)	-0.110 (0.115)	-0.111 (0.114)	-0.128 (0.115)	-0.106 (0.117)	-0.112 (0.117)	-0.128 (0.114)	-0.110 (0.116)	-0.076 (0.120)	-0.112 (0.117)	-0.097 (0.120)
Hutu share 2012			1.347 (0.823)	1.347 (0.823)		1.524 (1.312)	1.886 (1.175)	2.840** (1.241)	1.737 (1.197)	1.652 (1.203)	1.886 (1.175)	2.721** (1.208)
Ethnic fractionalization 2012 (st.)			-0.107 (0.103)	-0.107 (0.103)		0.029 (0.161)	-0.004 (0.142)	0.088 (0.155)	-0.016 (0.145)	-0.031 (0.147)	-0.004 (0.142)	0.075 (0.151)
Political fractionalization 2010 (st.)							0.048 (0.126)	0.375*** (0.144)			0.048 (0.126)	0.323 (0.251)
Political polarization 2010 (st.)							0.275** (0.112)		0.296*** (0.093)	0.313** (0.147)	0.275** (0.112)	0.052 (0.262)
Observations	822	822	822	822	822	822	822	822	822	822	822	822
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE
	<i>First stages</i>											
Political fractionalization 2005 (st.)								0.666*** (0.047)				0.592*** (0.059)
Political polarization 2005 (st.)												0.591*** (0.076)
Controls								Yes		Yes		Yes
Kleibergen-Paap F-test								202.104		89.226		14.604

Controls include municipalities' number of hutu demobilized soldiers per 1000 inhabitants, median wealth, population density, past violence. All estimations include neighborhood fixed effects. Standard errors are robust and clustered at the municipal level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In table 3, we show that the results are not affected when different types of fixed effects are considered. Our benchmark model is estimated without fixed effects, with pair fixed effect, with neighborhood fixed effect and with random pairs fixed effects. In the first four columns, political fractionalization is not instrumented. Columns (5) to (8) report the reduced form estimations. The results of IV approach are presented in columns (9) to (12).

The coefficients associated with demobilized rebels’ polarization are positive and strongly significant in all specifications. The impact of a one standard deviation increase in polarization on violent events ranges between 35% and 50% depending on the specification. This effect is large, representing a four-fold increase in the incidence of events between the lowest- and the highest-polarized municipalities (considering column (11), or a 38% increase). Figure 4 illustrates this finding. It shows the predicted number of events when ex-rebels’ polarization and fractionalization are considered simultaneously, as a function the projected number of groups of equal size in each municipality¹⁶. The predicted number of episodes is maximal when there are two groups of former rebels. Importantly, the number of demobilized rebels that returned in the municipality does not seem to be associated with electoral violence. We conclude that it is not the number of “hardcore supporters” which matters for triggering electoral violence. Rather, it suggests that electoral violence is more likely to occur in municipality characterized by a bipolar distribution of ex-rebel groups.

Figure 4: Predicted no. of events versus projected no. of groups of the same size



Note: this figure relies on the neighborhood fixed effect estimation (Table 3, Column (11))

¹⁶Assuming that each group has the same size, we compute a “projected” number of group corresponding to the fractionalization index in each municipality. Mathematically, if groups are of equal size, $\text{frac} = 1 - \frac{1}{n}$ where n is the number of groups. The x-axis reports n for each municipality such that $n = \frac{1}{(1-\text{frac})}$.

Table 3: Benchmark Results

	Political competition in 2010				Political competition in 2005				Instrumental variables strategy			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Demob. rebels' polarization (st.)	0.364*** (0.129)	0.337*** (0.102)	0.342*** (0.110)	0.343*** (0.122)	0.373*** (0.127)	0.393*** (0.107)	0.376*** (0.111)	0.398*** (0.126)	0.349*** (0.125)	0.342*** (0.103)	0.325*** (0.110)	0.352*** (0.124)
Demob. rebels' fractionalization (st.)	-0.299** (0.132)	-0.056 (0.105)	-0.125 (0.115)	-0.056 (0.130)	-0.337*** (0.138)	-0.156 (0.114)	-0.204* (0.121)	-0.159 (0.141)	-0.286** (0.129)	-0.065 (0.105)	-0.128 (0.114)	-0.074 (0.133)
Hutu share 2012	1.035 (1.005)	2.948** (1.331)	2.629** (1.260)	3.405** (1.490)	1.115 (0.995)	2.769** (1.197)	2.783** (1.179)	3.235** (1.416)	0.985 (0.970)	3.414*** (1.248)	2.840** (1.241)	3.975*** (1.494)
Ethnic fractionalization 2012 (st.)	-0.031 (0.140)	0.126 (0.167)	0.091 (0.158)	0.178 (0.182)	-0.028 (0.138)	0.139 (0.167)	0.133 (0.155)	0.187 (0.184)	-0.080 (0.131)	0.157 (0.166)	0.088 (0.155)	0.217 (0.185)
Political fractionalization 2010 (st.)	0.086 (0.102)	0.369*** (0.126)	0.323*** (0.114)	0.365** (0.145)					0.058 (0.120)	0.506*** (0.144)	0.375*** (0.144)	0.561*** (0.186)
Political fractionalization 2005 (st.)					0.113 (0.097)	0.303*** (0.083)	0.284*** (0.091)	0.328*** (0.108)				
No. demob. rebels (/1000)	0.000 (0.065)	0.020 (0.062)	0.020 (0.062)	0.039 (0.059)	0.006 (0.067)	0.030 (0.063)	0.029 (0.063)	0.052 (0.061)	-0.011 (0.062)	0.041 (0.062)	0.028 (0.061)	0.067 (0.062)
Past violence (log)	0.187* (0.097)	0.144 (0.104)	0.127 (0.109)	0.152 (0.100)	0.193** (0.094)	0.165* (0.099)	0.140 (0.107)	0.175* (0.095)	0.174* (0.093)	0.126 (0.102)	0.118 (0.106)	0.127 (0.100)
Median Wealth Index (st.)	0.021 (0.155)	-0.118 (0.150)	-0.026 (0.151)	-0.111 (0.165)	0.013 (0.157)	-0.119 (0.163)	-0.011 (0.173)	-0.128 (0.173)	0.045 (0.148)	-0.136 (0.157)	-0.013 (0.154)	-0.141 (0.171)
Population (log)	0.831*** (0.243)	1.076*** (0.223)	1.161*** (0.234)	1.074*** (0.246)	0.857*** (0.245)	1.181*** (0.227)	1.252*** (0.240)	1.185*** (0.251)	0.745*** (0.247)	1.102*** (0.218)	1.131*** (0.227)	1.102*** (0.249)
Population density (log)	0.295** (0.124)	0.131 (0.200)	0.160 (0.157)	0.078 (0.209)	0.305** (0.121)	0.161 (0.213)	0.201 (0.160)	0.108 (0.219)	0.263** (0.116)	0.141 (0.208)	0.155 (0.154)	0.089 (0.217)
Observations	128	1388	822	256	128	1388	822	256	128	1388	822	256
Fixed Effects	.	All	NFE	Random	.	All	NFE	Random	.	All	NFE	Random
Political fractionalization 2005 (st.)												
					0.829*** (0.049)	0.609*** (0.056)	0.666*** (0.047)	0.604*** (0.063)				
Controls					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap F-test					284.859	164.82	202.104	71.517				

No fixed effects are signaled by a dot. "All" refers to "All pairs", "NFE" to Neighborhood Fixed Effects, and "Random" to random pairs. In the first stage regressions, controls include demobilized rebels' polarization and fractionalization, Hutu share, ethnic fractionalization, municipalities' number of hutu demobilized soldiers per 1000 inhabitants, median wealth, population, population density, past violence. All estimations include neighborhood fixed effects. Standard errors are robust and clustered at the municipal level. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

From Table 3, we conclude that ethnic grievances between Hutu and Tutsi did not trigger electoral violence in 2010. Instead, violence was more likely to occur in municipalities characterized by a high proportion of Hutu. The coefficients associated with the Hutu share are positive in all specifications. They are significant at the 5% threshold with all types of fixed effects, but not significant at conventional thresholds in simple cross-section regressions. This suggests that the matching methods capture unobserved characteristics that are similar across neighboring municipalities. The average proportion of Hutu by municipality is around 80%. Based on the estimates presented in column (11), going from the lowest to the highest Hutu share predicts an increase of about eight events.

Political competition is also correlated to electoral violence. In table 3, political competition is captured by the index of political fractionalization in 2010. The coefficients associated with political fractionalization are positive and significant at the 1% threshold when tight fixed effects are included in the regression. This is the case when considering 2010 non-instrumented, the reduced form or the IV strategy estimations. The size of the effect is similar to the effect of demobilized rebels' polarization. An increase of one standard deviation in political fractionalization leads to between 33% to 66% more events, depending on the specification.

Table 4 also provides some evidence that past violence could be correlated with electoral violence in 2010. However, this relation is not significant in all regressions. This relationship will be studied in details in Section 5.1 when we will distinguish violent events which occurred before and after the municipal elections.

As one would expect, the coefficient associated with the log of population size is close to one and significant at 1% in all specification. Electoral violence increases proportionally with population size. The coefficient associated with population density is positive and significant without fixed effect. However, this effect vanishes when municipalities are matched with their neighbors. The wealth index is not significantly correlated with electoral violence.

4.2 Causality

Is the effect of ex-rebels polarization causal? Given the impossibility to randomly assign resettlement locations to ex-combatants or to find an appropriate instrument, we will discuss and rule out a set of alternative hypotheses that could explain the positive correlation between ex-rebels polarization and electoral violence.

Two types of unobservable characteristics could induce a spurious correlation between ex-rebels polarization and electoral violence. First, some unobserved factors A may have directly affected electoral violence. If these factors were determinants of the size of ex-rebels groups (e.g. reasons for joining the rebellion) such as to affect ex-rebel polarization

in a non-random way, the coefficient associated with ex-rebels' polarization would partly capture the impact of these unobserved variables A . One way to control for this is to include measures of the relative size of ex-rebel groups in the model. By doing so, we indirectly control for all unobserved factors affecting the composition of ex-rebel groups that could potentially impact electoral violence via another route. In column (1) of Table 4¹⁷, the proportions of ex-rebels belonging to each faction are included in the regressions. In column (2), the proportions of the population belonging to each faction are included in the regressions. Including these proportions as control variables do not change our results. The impact of polarization between ex-rebel groups on the occurrence of electoral violence remains positive and significant, and point estimates even increase.

Table 4: Causality

Dependent variable: total episodes of electoral violence

	Demob. by total demob. (1)	Demob. by population (2)	Without Bujumbura (3)	Demob. by origin (4)
Demob. rebels' polarization (st.)	0.397*** (0.138)	0.402*** (0.132)	0.403*** (0.115)	0.339*** (0.108)
Demob. rebels' fractionalization (st.)	-0.240 (0.194)	-0.267* (0.137)	-0.079 (0.132)	-0.135 (0.106)
Hutu share 2012	2.878** (1.154)	3.669*** (1.205)	4.659** (1.937)	2.272* (1.164)
Ethnic fractionalization 2012 (st.)	0.013 (0.142)	0.081 (0.143)	0.294 (0.243)	0.055 (0.146)
Political fractionalization 2010 (st.)	0.425*** (0.162)	0.441*** (0.159)	0.195 (0.129)	0.346** (0.139)
No. demob. rebels (/1000)	0.042 (0.066)	0.096 (0.120)	-0.078 (0.055)	-0.002 (0.063)
Past violence (log)	0.092 (0.106)	0.071 (0.103)	0.356*** (0.109)	0.094 (0.107)
Median Wealth Index (st.)	0.060 (0.148)	0.030 (0.131)	0.091 (0.087)	0.017 (0.174)
Population (log)	1.234*** (0.215)	1.252*** (0.229)	0.791*** (0.252)	1.105*** (0.235)
Population density (log)	0.119 (0.152)	0.080 (0.153)	0.168 (0.277)	0.124 (0.154)
Observations	822	822	748	822
Proportion demob.	Yes	Yes	No	No
Fixed Effects	NFE	NFE	NFE	NFE

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Second, some unobserved factors B may have influenced where ex-combatants resettled after the conflict. If these factors also had a direct impact on the occurrence of electoral violence, the coefficient associated with ex-rebels polarization could partly capture the effect of unobserved variables B . This type of bias is unlikely to affect our estimates for three reasons. First, a large majority of ex-rebels, 83%, returned to their

¹⁷The four specifications presented in Table 4 including all types of fixed effects are in Appendix, in Tables 10 to 13.

municipality of origin; 86% of them returned to their provinces of origin. These statistics suggest that most ex-combatants returned home after the conflict and that unobserved variables B only influenced a minority of them. Second, it is worth noting that 52% of those who did not returned home went to Bujumbura Mairie¹⁸. In fact, 70% of those who returned to Bujumbura Mairie are originally from another municipality. In column (3) of Table 4, we test if estimates are affected when the capital city is removed from the sample. The coefficient associated with ex-rebels polarization increases compared to the benchmark regressions, but is not statistically different. Finally, we tested if the results change when information on the origin of ex-rebels is used to compute fractionalization and polarization indexes. As shown in column (4), using the origin instead of the return municipality does not affect the significance nor the size of the coefficient associated with ex-rebels' polarization. We therefore conclude that the correlation between ex-rebels polarization and electoral violence is likely to be causal and unlikely to be driven by unobserved factors.

The effect of political competition is also likely to be causal as our instrumental variable approach precludes any reverse causality bias. The coefficient associated with political competition are similar with and without resorting to the instrumental variable approach, indicating that political competition is unlikely to be endogenous in our framework. Additionally, the reduced form estimates give similar results. As for demobilized rebels' polarization, we also tested whether some unobservable characteristics C could have impacted electoral violence directly, and have influenced votes via a separate route. If votes were affected in a non-random way such as to impact political competition, our regressions could partly capture these unobserved factors C . In order to test this hypothesis, we included the proportion of voters for each parties in the regression (Table 11 in Appendix). This increases the point estimates of the political competition index. The coefficient associated with ex-rebels' polarization is not affected.

Estimates could also suffer from reverse causality if the ethnic composition of municipalities has been significantly affected by electoral violence. Indeed, targeted violence towards one ethnic group to the point that it leads to change the composition is nearly impossible, and would have been noticed. Another source of bias could come from the level at which we measure ethnic diversity, which does to correspond to the measure of violence. Ethnic variables may therefore fail to capture some important variations between municipalities. Since the Afrobarometer is representative at the province level, ethnic shares calculated at the municipal level are mismeasured and, if used as such, associated coefficients suffer from an attenuation bias (Hausman 2001).

¹⁸The capital is very different from rural municipalities. As the capital city, it hosts most Burundian institutions as well as the headquarters of International Organizations working in Burundi. Municipalities located in Bujumbura Mairie are by far richer than rural ones ($p < 0.00$). It is also worth noting that municipalities of Bujumbura Mairie host on average more demobilized ex-combatants than rural municipalities ($p = 0.079$).

We have at our disposal another imperfect measure of ethnicity, which is based on the results of the 1993 presidential elections¹⁹. We test these two potential sources of biases by instrumenting ethnic composition from the Afrobarometer, computed at the municipal level, with data from the 1993 presidential elections. By extracting useful information from our two imperfect measures of ethnicity, this estimation makes sure to remove any source of reverse causality and solves the mismeasurement problem. We believe that the proportion of pro-Hutu votes in 1993 is correlated with the number of electoral violent episodes only through the ethnic composition in 2012, implying that the exogeneity condition of the instrument is satisfied (Hilbe 2011). As shown in Table 14 in Appendix, our results are not significantly affected when using this IV strategy. This suggests that the impact of the proportion of Hutu on electoral violence is likely to be causal.

4.3 Robustness

We further tested the robustness of our results in numerous specifications. We estimated our model with OLS, Poisson and Negative Binomial estimation methods, with three sorts of “tight fixed effects”, with alternative vector of covariates, without outliers, and controlling for spatial dependence. The effect of demobilized ex-rebels’ polarization on electoral violence is robust and strongly significant in all specifications. In addition, placebo tests suggest that our results are not driven by the specific nature of our variable of interest. The results of these tests are shown in Appendix.

Estimation methods and tight fixed effects. Our preferred estimation method is the negative binomial model because our dependent variable is a count variable characterized by overdispersion. We nevertheless did estimate OLS (Table 15 in Appendix) and Poisson (Table 16 in Appendix) models, which lead to similar conclusions. Our results are robust to all types of tight fixed effects, which control for the unobserved factors that are similar in neighboring municipalities.

Bad controls. Factors such as ethnic fractionalization could explain electoral violence and past violence simultaneously. Therefore, the inclusion of past violence as a covariate in the regression might mask the importance of other variables in explaining

¹⁹Two main candidates, one Hutu and one Tutsi, competed during the presidential elections in 1993 elections²⁰. The Hutu candidate was FRODEBU’s leader Melchior Ndadaye who won the election with 61% of the votes. The Tutsi candidate, Pierre Buyoya, got 35% of votes. Assuming that the Tutsi (resp. Hutu) were more likely to vote for a Tutsi (resp. Hutu), we could infer ethnic composition from the results of the elections. However, this assumption is dubious. First, some Hutu voted for Buyoya since people expected him to win and he had started the process of political liberalization. Then, some Tutsi voted for Ndadaye, looking to force the *Bururi lobby* out of the government. In addition to these considerations, it is likely that the 1993 ethnic composition does not reflect today’s diversity. Ethnic killings and migration indeed continued after 1993.

electoral violence. In this context, past violence could be a bad control (Angrist and Pischke 2008). Wealth can be considered as a bad control in the same way. We therefore excluded the index of past violence and the index of wealth from the list of covariates. Results are not affected by these changes. In particular, the correlation between ex-rebels' polarization and electoral violence remains positive and significant at the 1% level (Table 17 in Appendix).

Removing outliers. We tested how results are affected by the removal of outliers from the sample (Table 18 in Appendix). Outliers were defined as the observations whose standardized deviance residuals are greater than two (Hilbe 2011). Results do not change when this alternative sample is considered except for past violence, which becomes significant at conventional levels.

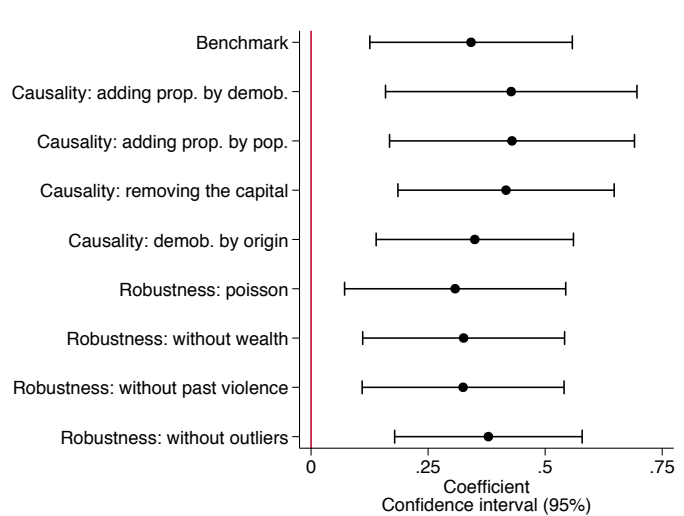
Spatial dependence. We also tested if spatial correlation in the dependent variable could bias our estimates and thereby drive the results (Table 19). This could occur if both electoral violence and the explanatory variables are spatially clustered. In this case, ignoring spatial interdependence in electoral violence would lead to inconsistent estimates. Reassuringly, Figure 1 does not indicate strong evidence of spatial correlation in electoral violence. This visual impression is confirmed by the fact that the Moran's statistic associated with the indicator of electoral violence is negative and not significant ($p = 0.330$). In other words, the occurrence of violence in one municipality did not seem to have affected electoral violence in neighboring municipalities. Problems of spatial dependence seem to be marginal for our study. As a robustness check, we nevertheless estimated our model by accounting for spatial dependence. We are not aware of any studies that demonstrated how to obtain consistent estimates for negative binomial models with spatial correlation. We therefore relied on three second-best approaches. First, we controlled for geographic coordinates of municipalities and for their square and cube. Second, we assessed how results are affected by the introduction of a spatial lag in the negative binomial model (Neumayer and Plümer 2010). Third, we estimated the models developed by Pisati (2010) for linear regression models. These two approaches were applied for two different weighting matrices: one identifying neighboring municipalities and one based on latitude and longitude data. The different estimation strategies and the two different weighting matrices give similar results. Overall, we do not find any evidence that spatial dependence could drive the results. If anything, spatial correlation in the dependent variable seems to be negative, leading to the underestimation of the effect of the polarization of ex-rebel groups on electoral violence.

Placebo test. Finally, we did placebo tests to check if our results could be driven by the nature of our explanatory variables (Table 20 in Appendix). The placebo test consists

of replacing the main regressor of interest by a variable of similar nature, but which is not expected to have predictive power on the dependent variable. In our case, the placebo test looks at whether different polarization indexes matter in explaining electoral violence when it should not. We test this with two different polarization indexes, based on age-groups²¹ and on religion respectively²². The former stems from the hypothesis that youth bulges may be a source of conflict (Urdal 2006). Nonetheless, it is the bulge itself, not the age-group polarization that could eventually matter²³. Then, religious diversity has been explored along ethnic diversity in the literature on the causes of civil conflict (Blattman and Miguel 2010). However, neither religious beliefs nor the resulting polarization index should affect electoral violence in the context of Burundi, where ethnicity rather than religion fueled violence in the past. Reassuringly, none of the placebo polarization indexes enters significantly in the regressions.

To conclude the analysis on aggregated events, Figure 5 shows graphically the point estimates and 95% confidence intervals associated with rebels' polarization across the previously mentioned specifications, with neighborhood fixed effects and political fractionalization instrumented.

Figure 5: Rebels' polarization's coefficient (and 95% CI) across specifications



²¹In order to construct the age polarization index, we first divided the DHS sample into alternative age-group scenarios. Starting from individual ages, we assigned every individual in a group, and computed the proportion of individual in each group at the municipality level. These proportions were then used to compute an index of age polarization at the municipality level. Results in online appendix are reported for a distribution of individuals according to the following categories: [0, 15[, [15, 40[, [40, 60[, [60, 80[, [80, 99]. Alternative scenarios give the same results.

²²The religious polarization index also relies on DHS data, which classifies men and women into 7 groups according to their religion (no religion, catholic, protestant, muslim, adventist, jehova witness and other). It was computed at the municipality level by following the same steps as for age-group polarization.

²³We tested this theory, and the number of young people has no impact on electoral violence when controlling for population size.

5 Discussion

It remains to understand why violence was more likely to occur in municipalities characterized by a high polarization between ex-rebel groups and high political competition. Do we observe differences in drivers between the episodes of electoral violence which occurred before the municipal poll, on May, 24, and those which occurred after, when most opposition parties started their boycott? Is ex-rebels' polarization triggering only certain types of violent events? Are the roots of electoral violence similar the causes of other types of violence, and in particular, to the causes of the 1993-2009 civil war? In this section, we will only report estimates for neighborhood fixed effects, instrumenting political fractionalization in 2010 with political fractionalization in 2005. Results are similar with other types of fixed effects.

5.1 The municipal elections: a tipping point

As explained in Section 2, the 2010 elections were a succession of five ballots, starting with the election of municipal representatives. After the first ballot, the opposition accused the CNDD-FDD of massive frauds and irregularities and boycotted the coming rounds. Given this evolution, it is interesting to test whether the same covariates explain the incidence of violence before and after May 24, 2010, for which 196 and 323 episodes of violence were recorded respectively.

In Table 5, the dependent variable is either the number of violent episodes which occurred before or after the municipal elections. We find that splitting the sample according to the timing of elections does not change the positive and significant effect of the polarization of demobilized groups on electoral violence. Interestingly, while political fractionalization had no significant impact before the poll, it becomes a strong predictor after the boycott.

To capture whether the municipalities with high political competition were differently affected by rebels' polarization, we add an interaction between the two variables (column (3), Table 5). Figure 6(a) shows that the marginal impact of the ex-rebels' polarization index on electoral violence is positive, decreasing when political fractionalization increases and significant when political competition is low. The marginal effect becomes non-significant when political competition is above one standard deviation from its mean. Similarly, figure 6(b) shows that the marginal impact of political competition on the dependent variable is positive, decreasing in ex-rebels' polarization and significant when ex-rebels' polarization is low, but not significantly different from zero where rebel groups are polarized above average.

Figure 6(c) represents the joint predicted effect induced by these two variables on violence. On the one hand, electoral violence was not likely to emerge if both ex-rebels' polarization index and political competition were low. On the other hand, episodes of

Table 5: Heterogenous effects

	(1)	(2)	(3)	(4)	(5)
	With Bujumbura Mairie			Without	
	Before	After boycott		Before	After
Demob. rebels' polarization (st.)	0.384*** (0.148)	0.270** (0.113)	0.311*** (0.117)	0.501*** (0.157)	0.388*** (0.130)
Demob. rebels' fractionalization (st.)	-0.136 (0.160)	-0.090 (0.123)	-0.094 (0.125)	-0.093 (0.185)	-0.059 (0.149)
Hutu share 2012	2.499 (1.682)	2.633* (1.376)	2.565* (1.322)	5.153** (2.418)	4.193* (2.274)
Ethnic fractionalization 2012 (st.)	0.021 (0.188)	0.106 (0.176)	0.119 (0.172)	0.325 (0.292)	0.247 (0.257)
Political fractionalization 2010 (st.)	0.203 (0.189)	0.358*** (0.131)	0.333** (0.130)	0.147 (0.148)	0.110 (0.122)
No. demob. rebels (/1000)	-0.006 (0.055)	0.028 (0.070)	0.024 (0.069)	-0.063 (0.056)	-0.120** (0.060)
Past violence (log)	0.037 (0.106)	0.168 (0.129)	0.174 (0.128)	0.194 (0.138)	0.507*** (0.121)
Median Wealth Index (st.)	-0.183 (0.134)	0.026 (0.161)	0.037 (0.161)	0.074 (0.141)	0.093 (0.074)
Population (log)	0.988*** (0.243)	1.217*** (0.271)	1.265*** (0.274)	0.935*** (0.304)	0.676** (0.271)
Population density (log)	0.443** (0.198)	0.023 (0.172)	0.009 (0.173)	0.109 (0.379)	0.220 (0.270)
Demob. rebels' polarization \times Political frac.			-0.113* (0.063)		
Observations	822	822	822	748	748
Fixed Effects	NFE	NFE	NFE	NFE	NFE

Clustered-robust standard errors in parentheses

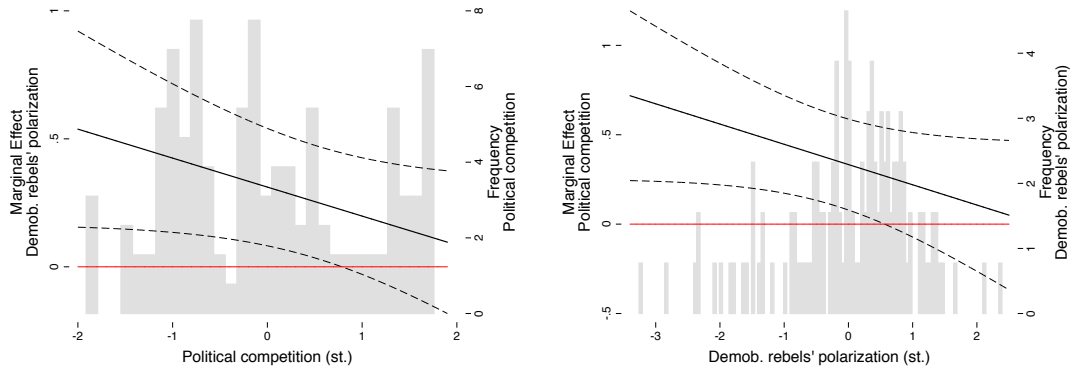
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

electoral violence were likely to occur in municipalities in which at least one of these two factors was high. Phrased differently, figure 6(c) suggests the existence of a saturation effect between these two factors: if either ex-rebels' polarization index is high or political completion is tight, a further increase in one of these two variables would have no significant impact on electoral violence.

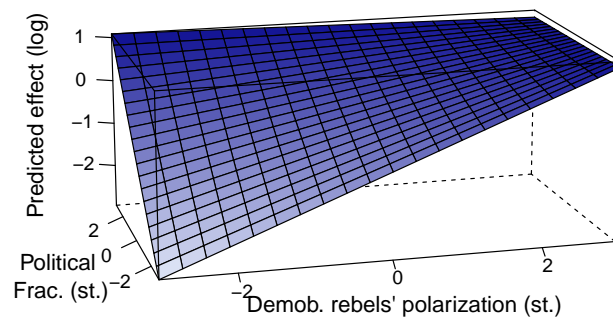
We also find that, in rural areas, while before the election, the coefficients associated with past violence was not significant, the impact past violence increases after the poll (Columns (4) and (5)), although it does not become significant. After the first poll, some frustrated ex-rebels may have gone back to fight in their original violence-prone areas. This is in line with the reports of the ICG (2012, 2011) which points out that, “[...] rumors circulated from July about the presence of armed groups gradually settling themselves in Kibira forest, a traditional sanctuary for rebel movements. [...] the presence of the FNL on the Rusizi plain, on the DRC side of the border was reported by different witnesses.” Households reporting looting, clashes between groups and attacks against the military confirmed these rumors (ICG 2012, 2011).

5.2 Disaggregating electoral violence

Total episodes is an aggregation of different types of events, from intimidation to murder. Table 6 shows the estimations of equation (1) for the different types of violence. Disag-



(a) Marginal effect of ex-rebels' polarization as a function of political competition (95% CI) (b) Marginal effect of political competition as a function of ex-rebels' polarization (95% CI)

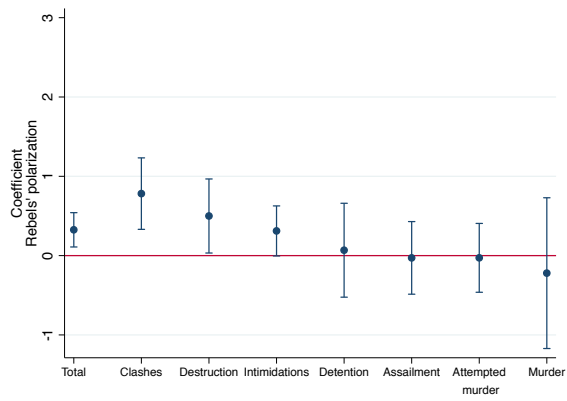


(c) Joint predicted effect of ex-rebels' polarization and political competition

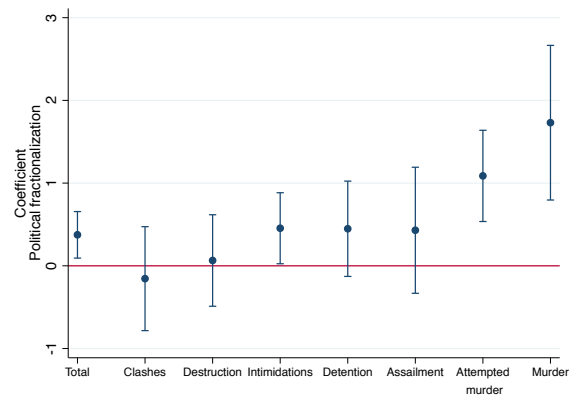
Figure 6: Heterogenous impact on electoral violence after the boycott

gregating by type of events sheds light on the particular type of events driving the effect of both ex-rebels' group and political competition. Demobilized rebels' polarization is positively associated with clashes and destruction of properties, and political fractionalization is not. Inversely, arbitrary detention, attempted murder and murder are explained by political fractionalization but not at all by ex-rebels' polarization. Both parties and ex-rebels do resort to intimidation, which is itself an aggregate of intimidation, harassments and disruptions in the electoral process. Figure 7 offers a graphical illustration of the impact of the rebels' and political polarization coefficients across types of episode.

These results suggests that political parties are mainly involved in targeted violence, such as arbitrary detention and murders. This type of violence requires more organization and means than clashes between groups and destructions of properties. Another interesting finding from the disaggregated analysis is that the correlation between the proportion of Hutu and clashes drives a lion's share of the effect we find on the aggregated events. This could be seen as evidence that ex-Hutu rebels from different factions are indeed hard-core supporters of their faction cause.



(a) Demobilized rebels' polarization



(b) Political fractionalization

Figure 7: Heterogenous impact across type of electoral violence

Table 6: Disaggregated electoral violence

	All events	Clashes	Destruction	Intimidation	Arbitrary detention	Assaultment	Attempted murder	Murder
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Demob. rebels' polarization (st.)	0.325*** (0.110)	0.782*** (0.230)	0.500** (0.238)	0.311* (0.161)	0.068 (0.302)	-0.029 (0.234)	-0.028 (0.221)	-0.221 (0.485)
Demob. rebels' fractionalization (st.)	-0.128 (0.114)	-0.038 (0.228)	-0.164 (0.243)	-0.185 (0.161)	-0.237 (0.336)	0.119 (0.267)	-0.230 (0.241)	0.639 (0.457)
Hutu share 2012	2.840** (1.241)	10.281*** (2.661)	1.803 (2.355)	2.291 (1.808)	3.025 (3.183)	2.271 (4.016)	0.807 (2.676)	6.059 (4.517)
Ethnic fractionalization 2012 (st.)	0.088 (0.155)	0.610** (0.249)	0.052 (0.236)	-0.011 (0.232)	0.326 (0.327)	-0.065 (0.432)	-0.061 (0.257)	0.387 (0.519)
Political fractionalization 2010 (st.)	0.375*** (0.144)	-0.155 (0.321)	0.064 (0.282)	0.454** (0.219)	0.448 (0.294)	0.430 (0.389)	1.087*** (0.281)	1.730*** (0.477)
No. demob. rebels (/1000)	0.028 (0.061)	0.104 (0.092)	-0.062 (0.095)	0.024 (0.073)	0.138 (0.084)	-0.110 (0.117)	0.086 (0.082)	0.156 (0.131)
Past violence (log)	0.118 (0.106)	-0.104 (0.175)	0.068 (0.180)	0.104 (0.144)	0.196 (0.160)	-0.036 (0.157)	0.234* (0.132)	0.072 (0.245)
Median Wealth Index (st.)	-0.013 (0.154)	0.377 (0.308)	-0.806 (0.750)	-0.051 (0.171)	-0.257 (0.280)	-0.531** (0.262)	0.086 (0.169)	-0.056 (0.329)
Population (log)	1.131*** (0.227)	1.249*** (0.422)	1.083*** (0.412)	1.289*** (0.320)	1.313** (0.514)	0.963 (0.643)	1.567*** (0.440)	1.296 (1.500)
Population density (log)	0.155 (0.154)	0.556* (0.327)	0.180 (0.350)	-0.105 (0.212)	0.533* (0.310)	0.696* (0.376)	0.061 (0.278)	0.396 (0.463)
Observations	822	822	822	822	822	822	822	822
Fixed Effects	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE

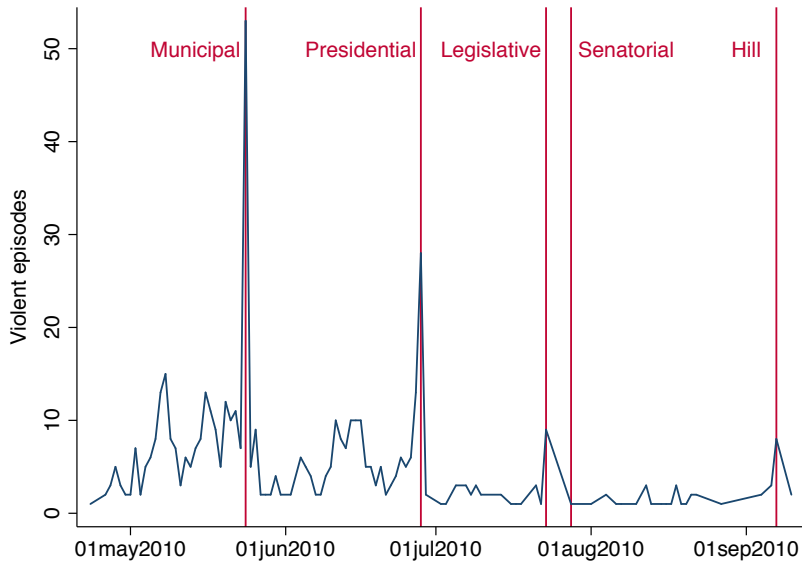
Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.3 Comparing electoral violence with other types of violence

Was electoral violence instrumental, serving the political parties to buy votes and win elections; or expressive, fed by grievances? It is hard to distinguish these two motivations, since both are generally involved. The timing of electoral violence shows clear peaks during periods close to the dates of the ballots, as shown in Figure 8. This suggests that at least a share of the episodes were driven by instrumental motivations.

Figure 8: Timing of electoral violence



Assuming that past violence was more expressive, another argument in favor of the instrumental motivation behind electoral violence would be that falsification tests²⁴ replacing electoral violence by past violence would be conclusive: we would not find the index of ex-rebels polarization to be significantly correlated with past violence. The same applies to political fractionalization. Columns (1) and (2) of Table 7 show the results of such test, which is conclusive for ex-rebels, but not so much for political parties. The latter are associated with more battles in the past. This is not surprising as most political parties were once rebel groups. This further indicates that the line distinguishing the share of instrumental and expressive motivation for violence is hard to draw.

Unless used by political parties to gain support, ethnic grievances could be seen as a motivating factor for more expressive forms of violence. Columns (1) of Table 7 shows that attacks against civilians were positively correlated with ethnic fractionalization, which has been shown to foster violence during civil war (Blattman and Miguel 2010). Yearly data are shown in Tables 21 and 22 Appendix and indicate that ethnic fractionalization was

²⁴Falsification tests propose to replace the dependent variable by another variable which is related in nature, but which is not expected to be affected by the same regressors of interest.

positively associated with past violence in most years. This holds for both battles and attacks against civilians. In addition, yearly data indicates that the number of ex-rebels coming from these municipalities also mattered. All in all, violence turned out to be more instrumental than expressive during the elections, while it was more expressive in war times.

Table 7: Falsification tests

	Attacks civilians (1)	Battles (2)	Domestic violence (3)	Fearing crime (4)	Crime issue (5)
Demob. rebels' polarization (st.)	0.159 (0.126)	-0.030 (0.098)	-0.007 (0.024)	-0.022 (0.115)	0.075 (0.076)
Demob. rebels' fractionalization (st.)	-0.115 (0.131)	-0.049 (0.104)	-0.001 (0.024)	-0.062 (0.086)	-0.014 (0.089)
Hutu share 2012	2.669* (1.520)	0.507 (1.154)	-0.468* (0.276)	-0.366 (1.110)	-0.352 (1.001)
Ethnic fractionalization 2012 (st.)	0.428*** (0.120)	0.097 (0.134)	-0.038 (0.033)	-0.149 (0.126)	-0.234** (0.111)
Political fractionalization 2010 (st.)	0.137 (0.199)	0.295** (0.143)	-0.058** (0.029)	-0.197 (0.142)	0.268** (0.122)
No. demob. rebels (/1000)	0.133*** (0.042)	0.073* (0.042)	0.003 (0.010)	0.035 (0.035)	0.003 (0.025)
Median Wealth Index (st.)	-0.086 (0.129)	-0.001 (0.128)	-0.221*** (0.031)	-0.316* (0.181)	0.006 (0.075)
Population (log)	1.594*** (0.187)	1.661*** (0.194)	-0.060 (0.049)	-0.513*** (0.187)	0.093 (0.185)
Population density (log)	0.119 (0.151)	0.136 (0.122)	-0.015 (0.038)	-0.070 (0.152)	-0.171* (0.097)
Past violence (log)			0.047*** (0.017)	0.014 (0.077)	-0.023 (0.056)
Observations	822	822	822	716	716
Fixed Effects	NFE	NFE	NFE	NFE	NFE

Note: the number of demobilized is by municipality of origin in columns (1) and (2), and by municipality of return in columns (3) to (5). Attacks against civilians and battles aggregates all ACLED records by type between 1997 and 2009.

We further look at other measures of violence in columns (3) to (5). First, an indicator of domestic violence was computed using data from the 2010 DHS survey²⁵. For each municipality where the DHS has been conducted, we compute proportion of individuals²⁶ who think that beating is justified in at least one of the five following situations: the wife goes out without telling her husband, she neglects children, she argues with her husband, she refuses to have sex with him or she burns the food. Second, we rely on the fifth round of the Afrobarometer survey to build two proxies for crime prevalence. The first indicator measures how often households have feared crime in their own house²⁷. The second proxy for crime is the proportion of people that have reported “crime and security” as one of the

²⁵Only 128 (out of 129) municipalities were included in the DHS.

²⁶Interviews were conducted among men and women separately. Both give the same results. We only report women given that the sample was larger, and hence the proportion better estimated.

²⁷Possible responses are never, just once or twice, few times, many times or always. For constructing the proxy for crime, we created a dummy variable equal to one if they already feared crime at least a few times. Results are robust to the alternative definition measuring the proportion of people who had feared crime at least once (not shown).

three most important problems faced by Burundi²⁸. Results are reported in column (3) to (5) of Table 7. These regressions are estimated using Ordinary Least Squares. The test is conclusive for all three indicators and demobilized rebels' polarization. Only political fractionalization in 2010 predicts that a more important share of people reported crime as an important issue. A possible explanation is that in an environment of high political competition, respondents ranked crime and security as one of the three most important problems of Burundi. Additionally, the survey was conducted less than two years after the elections, which took place in a politically volatile environment.

6 Concluding remarks

In the last four decades, 80% of elections in sub-Saharan Africa suffered from some form of violence, bribery, intimidation or inequitable government interference (Bishop and Hoeffler 2014). Understanding the causes of electoral misconduct is of crucial importance for strengthening the legitimacy of young democracies, encouraging social cohesion and minimizing the risks of relapse into civil war. The current academic debate on the causes of electoral fraud and violence focused on two main triggers: ethnic grievances and political competition. This paper tested these hypotheses by investigating the causes of 2010 electoral violence in Burundi.

Our study emphasized the involvement of ex-combatants in perpetrating electoral violence, a cause that has been neglected in the literature. In particular, our analysis showed that the violence which affected the 2010 electoral cycle in Burundi was mainly caused by old tensions between Hutu ex-rebel groups which recurred throughout electoral competition. We found that an acute polarization between ex-rebel groups was highly conducive to electoral violence. Interestingly, political competition between parties did matter too, but for different types of events. In particular, the types of events that are explained by increase in political rivalry require more organization and means (e.g. murder) than the ones explained by ex-rebels' polarization (e.g. clashes).

In contrast, we did not find support for the ethnic hypothesis. Rather than ethnic grievances between the Hutu and the Tutsi, measured by an ethnic fractionalization index, it is the proportion of Hutu that has been driving electoral violence. While ethnic rivalries for holding power were the main causes of the 1965, 1972 and 1988 massacres and of the 1993-2009 civil war, ethnic cleavages did not trigger electoral violence in 2010. Our results therefore indicate that the roots of violence in Burundi switched to an intra-Hutu competition between ex-rebel groups and political parties to capture the benefits of power.

Our study conveys that demobilization programs alone may be insufficient to prevent

²⁸Only 111 municipalities were surveyed in the Afrobarometer, which further decreases our sample size.

the resurgence of violence. Policies aiming to facilitate the transition from rebellion to political competition are needed in post-conflict settings. In addition to prevention campaigns among civilians, campaigns against violence should be targeted more specifically to ex-rebels and their parties.

References

- Alesina, A., A. Devleeschauwer, W. Easterly, S. Kurlat and R. Wacziarg (2003), “Fractionalization”, *Journal of Economic Growth*, 8(2), 155–194.
- Angrist, J. and J.-S. Pischke (2008), *Mostly Harmless Econometrics: An Empiricist’s Companion*, Princeton University Press, Princeton, USA.
- Annan, J., C. Blattman, D. Mazurana and K. Carlson (2011), “Civil War, Reintegration, and Gender in northern Uganda”, *Journal of Conflict Resolution*, 55(6), 877–908.
- Berman, E., M. Callen, C. Gibson and J. Long (2014), “Election Fairness and Government Legitimacy in Afghanistan”, *NBER Working Papers*, 19949.
- Bishop, S. and A. Hoeffler (2014), “Free and Fair Elections - A New Database”, *CSAE Working Papers*, 14.
- Blattman, C. and E. Miguel (2010), “Civil War”, *Journal of Economic Literature*, 48(1), 3–57.
- Brancati, D. and J. Snyder (2012), “Time to Kill: The Impact of Election Timing on Postconflict Stability”, *Journal of Conflict Resolution*, 57(5), 822–853.
- Cameron, C., J. Gelbach and D. Miller (2011), “Robust Inference With Multiway Clustering”, *Journal of Business & Economic Statistics*, 29(2), 238–249.
- Chaturvedi, A. (2005), “Rigging Elections With Violence”, *Public Choice*, 125(1-2), 189–202.
- Chauvet, L. and P. Collier (2009), “Elections and Economic Policy in Developing Countries”, *Economic Policy*, 24(59), 509–550.
- Collier, P. (2008), *The bottom billion: Why the poorest countries are failing and what can be done about it*, Oxford University Press, New York.
- Collier, P. and A. Hoeffler (2013), “Do Elections Matter for Economic Performance?”, *Oxford Bulletin of Economics and Statistics*, forthcoming.
- Collier, P. and P. Vicente (2012), “Violence, Bribery, and Fraud: the Political Economy of Elections in Sub-Saharan Africa”, *Public Choice*, 153(1-2), 117–147.

- (2013), “Votes and Violence: Evidence from a Field Experiment in Nigeria”, *The Economic Journal*, 124(February), 327–355.
- D’Aoust, O., O. Sterck and P. Verwimp (2013), “Buying Peace: The Mirage of Demobilizing Rebels”, *ECARES Working Papers*, 22.
- Dercon, S. and R. Gutiérrez-Romero (2012), “Triggers and Characteristics of the 2007 Kenyan Electoral Violence”, *World Development*, 40(4), 731–744.
- Dupas, P. and J. Robinson (2010), “Coping with Political Instability: Micro Evidence from Kenya’s 2007 Election Crisis”, *American Economic Review*, 100(2), 120–124.
- (2012), “The (hidden) costs of political instability: Evidence from Kenya’s 2007 election crisis”, *Journal of Development Economics*, 99(2), 314–329.
- Eifert, B., E. Miguel and D. Posner (2010), “Political Competition and Ethnic Identification in Africa”, *American Journal of Political Science*, 54(2), 494–510.
- Ellman, M. and L. Wantchekon (2000), “Electoral Competition under the Threat of Political Unrest”, *The Quarterly journal of economics*, 115(2), 499–531.
- Fafchamps, M. and P. Vicente (2013), “Political Violence and Social Networks: Experimental Evidence from a Nigerian Election”, *Journal of Development Economics*, 101(1), 27–48.
- Falch, A. (2009), “Vers une Démocratie Durable au Burundi ? Une Evaluation des Promesses et Ecueils du Processus de Démocratisation au Burundi”, *International Research Peace Institute, Oslo*.
- Garcia-Montalvo, J. and M. Reynal-Querol (2005), “Ethnic Polarization, Potential Conflict and Civil Wars”, *American Economic Review*, 95(3), 796–816.
- Gilligan, M., E. Mvukiyehe and C. Samii (2013), “Reintegrating Rebels into Civilian Life: Quasi-Experimental Evidence from Burundi”, *Journal of Conflict Resolution*, 57(4), 598–626.
- Goose, S. and F. Smyth (1994), “Arming Genocide in Rwanda”, *Foreign Aff.*, 73, 86.
- Gutiérrez-Romero, R. (2012), “An Inquiry into the Use of Illegal Electoral Practices and Effects of Political Violence”, *CSAE Working Papers*, 6.
- Hafner-Burton, E. M., S. D. Hyde and R. S. Jablonski (2013), “When Do Governments Resort to Election Violence?”, *British Journal of Political Science*, 44(01), 149–179.
- Hausman, J. (2001), “Mismeasured Variables in Econometric Analysis : Problems from the Right and Problems from the Left”, *Journal of Economic Perspectives*, 15(4), 57–67.

- Hegre, H., T. Ellingsen, S. Gates and N.-P. Gleditsch (2001), “Toward a Democratic Civil Peace? Democracy, Political Change, and Civil War, 1816-1992”, *American Political Science Review*, 95(1), 33–48.
- Helbig de Balzac, H., B. Ingelaere and S. Vandeginste (2011), “Voting Practices and Voters Political Thinking during the 2010 Burundi Elections”, *Institute of Development Policy and Management (IOB) Working Papers*, 6.
- Henderson, E. and J. Singer (2000), “Civil War in the Post-Colonial World, 1946-92”, *Journal of Peace Research*, 37(3), 275–299.
- Hilbe, J. (2011), *Negative binomial regression*, Cambridge University Press, Cambridge, USA.
- Huillery, E. (2009), “History Matters: The Long-Term Impact of Colonial Public Investments in French West Africa”, *American Economic Journal: Applied Economics*, 1(2), 176–215.
- Humphreys, M. and J. Weinstein (2005), “Disentangling the Determinants of Successful Demobilization and Reintegration”, *Center for Global Development Working Papers*, 69.
- (2007), “Demobilization and reintegration”, *Journal of Conflict Resolution*, 51(4), 531–567.
- ICG (2011), “Burundi: From Electoral boycott to Political Impasse”, *International Crisis Group Report*, 169.
- (2012), “Burundi: Bye-Bye Arusha?”, *International Crisis Group Report*, 192.
- IFES (2010), “International Foundation for Electoral Systems”, URL <http://www.ifes.org/countries/Burundi.aspx>.
- Kudamatsu, M. (2012), “Has Democratization Reduced Infant Mortality in Sub-Saharan Africa? Evidence From Micro Data”, *Journal of European Association*, 10(6), 1294–1317.
- Lemarchand, R. (1998), “Genocide in the Great Lakes Which Genocide Whose Genocide”, *African Studies Review*, 41(1), 3–16.
- Neumayer, E. and T. Plümper (2010), “Galton’s Problem and Contagion in International Terrorism along Civilizational Lines”, *Conflict Management and Peace Science*, 27(4), 308–325.

- Omotola, S. (2010), “Explaining Electoral Violence in Africa’s “New” Democracies”, *African Journal on Conflict Resolution*, 10(3), 51–73.
- Pisati, M. (2010), “sg162: Tools for Spatial Data Analysis”, *Stata Technical Bulletin*, 60, 21–37.
- Prunier, G. (2009), *From Genocide to Continental War. The Congolese Conflict and the Crisis in Contemporary Africa*, Hurst and Company, London, UK.
- Raleigh, C., A. Linke, H. Hegre and J. Karlsen (2010), “Introducing ACLED-Armed Conflict Location and Event Data.”, *Journal of Peace Research*, 47(5), 1–10.
- Reilly, B. (2002), “Elections in Post-Conflict Scenarios: Constraints and Dangers”, *International Peacekeeping*, 9(2), 118–139.
- Robinson, J. and R. Torvik (2009), “The Real Swing Voter’s Curse”, *American Economic Review*, 99(2), 310–315.
- Rutstein, S.-O. and K. Johnson (2004), “The DHS wealth index”, *DHS Comparative Reports*, 6.
- Soudriette, R. and J. Pilon (2007), *Every Vote Counts: The Role of Elections in Building Democracy*, University Press of America, USA.
- Urdal, H. (2006), “A Clash of Generations? Youth Bulges and Political Violence”, *International Studies Quarterly*, 50, 607–629.
- Vandeginste, S. (2012), “Burundi’s Truth and Reconciliation Commission: How to Shed Light on the Past while Standing in the Dark Shadow of Politics?”, *International Journal of Transitional Justice*, 6(2), 355–365.
- Verwimp, P. and T. Bundervoet (2009), “Civil War and the Welfare of Extended Households: Evidence from Longitudinal Data from Burundi”, *HiCN Working Papers*, 70.
- Wilkinson, S. (2004), *Votes and Violence: Electoral Competition and Ethnic Riots in India*, Cambridge University Press, Cambridge, UK.
- Wooldridge, J. (2010), *Econometric Analysis of Cross Section and Panel Data*, MIT Press Books, MIT Press (2nd edition), Cambridge, USA.
- World Bank (2004), *Emergency Demobilization and Transitional Reintegration in Burundi*, The World Bank Group, Washington DC, USA.

Table 8: Benchmark with political polarization only

	Political competition in 2010				Political competition in 2005				Instrumental variables strategy			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Demob. rebels' polarization (st.)	0.335** (0.133)	0.304*** (0.110)	0.290** (0.116)	0.316** (0.128)	0.350*** (0.127)	0.362*** (0.107)	0.342*** (0.112)	0.359*** (0.123)	0.323** (0.132)	0.301*** (0.107)	0.253** (0.112)	0.314** (0.125)
Demob. rebels' fractionalization (st.)	-0.297** (0.128)	-0.053 (0.110)	-0.110 (0.116)	-0.052 (0.135)	-0.295** (0.138)	-0.116 (0.117)	-0.163 (0.123)	-0.103 (0.137)	-0.249* (0.143)	-0.056 (0.112)	-0.076 (0.120)	-0.054 (0.133)
Hutu share 2012	0.935 (1.025)	1.956 (1.279)	1.737 (1.197)	2.388 (1.497)	0.922 (1.013)	2.090 (1.331)	2.070 (1.280)	2.440* (1.441)	1.058 (1.105)	1.968 (1.282)	1.652 (1.203)	2.374* (1.409)
Ethnic fractionalization 2012 (st.)	-0.057 (0.144)	0.023 (0.148)	-0.016 (0.145)	0.071 (0.173)	-0.032 (0.140)	0.081 (0.166)	0.066 (0.158)	0.114 (0.179)	-0.008 (0.160)	0.019 (0.147)	-0.031 (0.167)	0.066 (0.167)
Political fractionalization 2010 (st.)	0.159 (0.100)	0.291*** (0.095)	0.296*** (0.093)	0.265*** (0.100)					0.030 (0.152)	0.316** (0.150)	0.313** (0.147)	0.283* (0.161)
Political polarization 2005 (st.)					0.038 (0.100)	0.204** (0.088)	0.202** (0.093)	0.183* (0.094)				
No. demob. rebels (/1000)	-0.006 (0.059)	-0.005 (0.052)	0.001 (0.053)	0.008 (0.052)	-0.005 (0.064)	-0.015 (0.053)	-0.011 (0.055)	-0.001 (0.053)	-0.009 (0.061)	-0.003 (0.052)	-0.005 (0.055)	0.008 (0.053)
Past violence (log)	0.161 (0.099)	0.112 (0.104)	0.087 (0.104)	0.133 (0.104)	0.199** (0.095)	0.155 (0.105)	0.131 (0.109)	0.171* (0.102)	0.197* (0.105)	0.108 (0.110)	0.090 (0.107)	0.130 (0.106)
Median Wealth Index (st.)	0.063 (0.144)	-0.021 (0.124)	0.064 (0.133)	-0.018 (0.163)	0.046 (0.146)	-0.047 (0.145)	0.054 (0.149)	-0.042 (0.168)	0.067 (0.144)	-0.021 (0.124)	0.062 (0.138)	-0.018 (0.157)
Population (log)	0.876*** (0.242)	1.169*** (0.218)	1.251*** (0.223)	1.146*** (0.255)	0.799*** (0.239)	1.166*** (0.231)	1.226*** (0.237)	1.137*** (0.254)	0.798*** (0.260)	1.176*** (0.222)	1.233*** (0.226)	1.148*** (0.253)
Population density (log)	0.263** (0.123)	0.088 (0.178)	0.102 (0.146)	0.046 (0.200)	0.304** (0.123)	0.138 (0.203)	0.170 (0.156)	0.080 (0.215)	0.270** (0.116)	0.087 (0.177)	0.098 (0.147)	0.043 (0.199)
Observations	128	1388	822	256	128	1388	822	256	128	1388	822	256
Fixed Effects	.	All	NFE	Random	.	All	NFE	Random	.	All	NFE	Random
Political polarization 2005 (st.)									0.640*** (0.066)	0.590*** (0.073)	0.618*** (0.065)	0.593*** (0.086)
Controls					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Kleibergen-Paap F-test					94.395	74.73	89.226	39.492				

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Benchmark with both political fractionalization and polarization

	Dependent variable: total episodes of electoral violence											
	Political competition in 2010				Political competition in 2005				Instrumental variables strategy			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Demob. rebels' polarization (st.)	0.324** (0.137)	0.305*** (0.107)	0.293** (0.115)	0.323** (0.126)	0.381*** (0.124)	0.388*** (0.104)	0.367*** (0.109)	0.402*** (0.125)	0.372*** (0.127)	0.351*** (0.111)	0.295*** (0.113)	0.395*** (0.137)
Demob. rebels' fractionalization (st.)	-0.287** (0.133)	-0.054 (0.108)	-0.112 (0.117)	-0.057 (0.131)	-0.335** (0.138)	-0.157 (0.114)	-0.202* (0.122)	-0.162 (0.140)	-0.266** (0.135)	-0.061 (0.111)	-0.097 (0.120)	-0.080 (0.139)
Hutu share 2012	0.863 (1.010)	2.257* (1.262)	1.886 (1.175)	2.793* (1.462)	1.180 (1.022)	2.723** (1.172)	2.689** (1.165)	3.204** (1.417)	1.572 (1.028)	3.448*** (1.218)	2.721** (1.208)	4.448*** (1.661)
Ethnic fractionalization 2012 (st.)	-0.060 (0.143)	0.047 (0.146)	-0.004 (0.142)	0.110 (0.172)	-0.024 (0.139)	0.136 (0.162)	0.122 (0.151)	0.182 (0.184)	-0.008 (0.147)	0.171 (0.149)	0.075 (0.151)	0.285 (0.199)
Political fractionalization 2010 (st.)	-0.046 (0.119)	0.091 (0.120)	0.048 (0.126)	0.127 (0.175)					0.148 (0.192)	0.487* (0.263)	0.323 (0.251)	0.751** (0.367)
Political polarization 2010 (st.)	0.183 (0.119)	0.252** (0.107)	0.275** (0.112)	0.209* (0.121)					-0.199 (0.230)	-0.003 (0.278)	0.052 (0.262)	-0.196 (0.314)
Political fractionalization 2005 (st.)					0.175 (0.168)	0.237* (0.137)	0.210 (0.146)	0.322* (0.165)				
Political polarization 2005 (st.)					-0.072 (0.165)	0.076 (0.140)	0.085 (0.145)	0.010 (0.144)				
No. demob. rebels (/1000)	-0.008 (0.059)	0.003 (0.053)	0.005 (0.055)	0.020 (0.054)	0.015 (0.071)	0.022 (0.058)	0.020 (0.060)	0.048 (0.061)	-0.011 (0.060)	0.038 (0.057)	0.024 (0.057)	0.072 (0.065)
Past violence (log)	0.163* (0.099)	0.113 (0.104)	0.088 (0.104)	0.132 (0.101)	0.191** (0.094)	0.159 (0.103)	0.134 (0.108)	0.175* (0.099)	0.180* (0.096)	0.118 (0.110)	0.103 (0.106)	0.135 (0.104)
Median Wealth Index (st.)	0.078 (0.148)	-0.039 (0.132)	0.054 (0.140)	-0.042 (0.162)	-0.011 (0.159)	-0.099 (0.156)	0.012 (0.159)	-0.127 (0.179)	0.074 (0.136)	-0.101 (0.140)	0.016 (0.149)	-0.153 (0.177)
Population (log)	0.866*** (0.244)	1.157*** (0.218)	1.246*** (0.224)	1.139*** (0.245)	0.870*** (0.250)	1.193*** (0.227)	1.260*** (0.237)	1.192*** (0.254)	0.742*** (0.241)	1.137*** (0.224)	1.191*** (0.219)	1.099*** (0.261)
Population density (log)	0.261** (0.122)	0.096 (0.180)	0.106 (0.147)	0.056 (0.201)	0.304** (0.123)	0.161 (0.209)	0.196 (0.156)	0.107 (0.222)	0.231** (0.094)	0.144 (0.181)	0.140 (0.141)	0.110 (0.205)
Observations	128	1388	822	256	128	1388	822	256	128	1388	822	256
Fixed Effects	.	All	NFE	Random	.	All	NFE	Random	.	All	NFE	Random
Political fractionalization 2005 (st.)												
Political polarization 2005 (st.)												
Controls												
Kleibergen-Paap F-test					Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
					30.876	11.355	14.604	14.604	30.876	11.355	14.604	14.604

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Controlling for the proportion of ex-combatants from each faction

	<i>Dependent variable: total episodes of electoral violence</i>									
	Relative proportion of demobilized rebels					Proportion of population being demobilized				
	OLS (1)	(2)	(3)	(4)	(5)	OLS (6)	(7)	(8)	(9)	(10)
Demob. rebels' polarization (st.)	0.312* (0.162)	0.312* (0.162)	0.464*** (0.149)	0.400*** (0.141)	0.372** (0.169)	0.336** (0.148)	0.336** (0.148)	0.452*** (0.136)	0.399*** (0.135)	0.473*** (0.157)
Demob. rebels' fractionalization (st.)	-0.236 (0.216)	-0.236 (0.216)	-0.248 (0.200)	-0.227 (0.189)	-0.158 (0.198)	-0.319** (0.148)	-0.319** (0.148)	-0.232 (0.141)	-0.259* (0.140)	-0.250 (0.163)
Hutu share 2012	1.140 (1.067)	1.140 (1.067)	3.355*** (1.284)	2.957** (1.202)	2.804* (1.592)	1.781 (1.120)	1.781 (1.120)	4.306*** (1.311)	3.811*** (1.247)	4.504*** (1.473)
Ethnic fractionalization 2012 (st.)	-0.167 (0.145)	-0.167 (0.145)	0.042 (0.169)	0.009 (0.152)	-0.022 (0.195)	-0.101 (0.151)	-0.101 (0.151)	0.133 (0.152)	0.090 (0.146)	0.149 (0.175)
Political fractionalization 2010 (st.)	0.232 (0.144)	0.232 (0.144)	0.373*** (0.132)	0.365*** (0.135)	0.622*** (0.168)	0.216* (0.128)	0.216* (0.128)	0.454*** (0.144)	0.400*** (0.129)	0.522*** (0.157)
No. demob. rebels (/1000)	-0.002 (0.066)	-0.002 (0.066)	0.031 (0.064)	0.027 (0.063)	0.094 (0.065)	0.064 (0.119)	0.064 (0.119)	0.116 (0.110)	0.062 (0.111)	0.096 (0.121)
Past violence (log)	0.118 (0.104)	0.118 (0.104)	0.120 (0.101)	0.094 (0.105)	0.080 (0.102)	0.120 (0.106)	0.120 (0.106)	0.075 (0.102)	0.068 (0.103)	0.088 (0.104)
Median Wealth Index (st.)	0.043 (0.146)	0.043 (0.146)	0.034 (0.145)	0.096 (0.141)	-0.041 (0.158)	0.106 (0.135)	0.106 (0.135)	-0.063 (0.117)	0.066 (0.127)	-0.056 (0.156)
Population (log)	0.921*** (0.272)	0.921*** (0.272)	1.098*** (0.207)	1.165*** (0.221)	1.400*** (0.270)	0.934*** (0.286)	0.934*** (0.286)	1.200*** (0.218)	1.203*** (0.233)	1.371*** (0.278)
Population density (log)	0.181 (0.153)	0.181 (0.153)	0.113 (0.175)	0.126 (0.148)	-0.093 (0.191)	0.156 (0.152)	0.156 (0.152)	0.038 (0.154)	0.080 (0.149)	-0.072 (0.197)
CNDD	-1.534 (1.000)	-1.534 (1.000)	-1.377 (0.960)	-0.956 (0.971)	-4.648** (2.216)	-0.895** (0.357)	-0.895** (0.357)	-0.806** (0.409)	-0.662** (0.305)	-0.869** (0.434)
FNL - Rwasa	0.505 (0.606)	0.505 (0.606)	1.335* (0.682)	1.139* (0.625)	1.770** (0.817)	0.021 (0.300)	0.021 (0.300)	-0.125 (0.268)	0.002 (0.272)	0.011 (0.267)
FNL Dissidents	-2.688 (2.157)	-2.688 (2.157)	-0.373 (2.078)	-1.219 (2.022)	-7.600*** (2.674)	-1.549** (0.636)	-1.549** (0.636)	-1.436*** (0.323)	-1.373*** (0.427)	-1.478*** (0.415)
FNL Icanzo	9.453* (5.283)	9.453* (5.283)	11.490*** (3.752)	10.110** (3.946)	20.506*** (6.731)	5.306** (2.654)	5.306** (2.654)	5.066*** (1.591)	5.064*** (1.902)	5.460*** (1.684)
Frolina	0.698 (0.705)	0.698 (0.705)	1.591* (0.860)	1.237* (0.734)	2.051 (2.396)	0.351 (0.320)	0.351 (0.320)	0.441 (0.373)	0.412 (0.332)	0.533 (0.428)
KAZE-FDD	0.164 (2.363)	0.164 (2.363)	2.541 (2.466)	2.097 (2.276)	9.990** (4.482)	1.081 (0.877)	1.081 (0.877)	1.726** (0.726)	1.545** (0.766)	2.083*** (0.767)
Palipe Agazika	-2.629* (1.512)	-2.629* (1.512)	-1.057 (1.577)	-1.788 (1.569)	-1.401 (2.389)	-0.035 (0.650)	-0.035 (0.650)	0.035 (0.502)	0.176 (0.581)	0.062 (0.565)
Observations	128	128	1388	822	256	128	128	1388	822	256
Fixed Effects	.	.	All	NFE	Random	.	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: With the proportion of voters for each parties

Dependent variable: total episodes of electoral violence

	OLS		Negative Binomial		
	(1)	(2)	(3)	(4)	(5)
Demob. rebels' polarization (st.)	0.889 (0.564)	0.293** (0.130)	0.376*** (0.125)	0.300** (0.120)	0.367** (0.149)
Demob. rebels' fractionalization (st.)	-0.593 (0.554)	-0.131 (0.154)	-0.068 (0.159)	-0.083 (0.150)	-0.078 (0.179)
No. demob. rebels (/1000)	-0.046 (0.291)	0.004 (0.053)	0.023 (0.061)	0.009 (0.055)	0.019 (0.061)
Hutu share 2012	-3.464 (7.033)	0.829 (1.222)	0.719 (1.467)	1.045 (1.249)	1.008 (2.082)
Ethnic frac. 2012 (st.)	-0.533 (0.902)	0.096 (0.164)	-0.019 (0.188)	0.056 (0.167)	0.050 (0.239)
Frac2010st	0.851 (1.675)	0.465 (0.412)	0.833** (0.324)	0.643* (0.350)	0.608 (0.382)
Past violence (log)	0.442 (0.534)	0.132* (0.074)	0.083 (0.096)	0.105 (0.085)	0.098 (0.098)
Median Wealth Index (st.)	-0.690 (0.830)	-0.134 (0.193)	-0.250 (0.155)	-0.120 (0.162)	-0.167 (0.168)
Population (log)	3.594** (1.411)	0.954*** (0.276)	1.268*** (0.246)	1.199*** (0.227)	1.340*** (0.301)
Population density (log)	0.340 (0.751)	0.165 (0.156)	-0.038 (0.184)	0.050 (0.173)	-0.212 (0.219)
Observations	128	128	1388	822	256
Fixed Effects	.	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Without Bujumbura Mairie

Dependent variable: total episodes of electoral violence

	OLS		Negative Binomial		
	(1)	(2)	(3)	(4)	(5)
Demob. rebels' polarization (st.)	1.630*** (0.528)	0.441*** (0.133)	0.444*** (0.116)	0.403*** (0.115)	0.465*** (0.136)
Demob. rebels' fractionalization (st.)	-0.974* (0.539)	-0.205 (0.151)	-0.051 (0.128)	-0.079 (0.132)	-0.050 (0.149)
Hutu share 2012	3.942 (5.505)	2.048 (1.614)	5.227** (2.142)	4.659** (1.937)	6.058** (2.517)
Ethnic fractionalization 2012 (st.)	-0.394 (0.803)	0.025 (0.203)	0.358 (0.261)	0.294 (0.243)	0.454 (0.294)
Political fractionalization 2010 (st.)	-0.229 (0.441)	-0.010 (0.131)	0.251* (0.132)	0.195 (0.129)	0.286* (0.168)
No. demob. rebels (/1000)	-0.541** (0.230)	-0.107* (0.059)	-0.087* (0.050)	-0.078 (0.055)	-0.058 (0.060)
Past violence (log)	1.493*** (0.479)	0.326*** (0.089)	0.375*** (0.124)	0.356*** (0.109)	0.344*** (0.127)
Median Wealth Index (st.)	0.503 (0.444)	0.059 (0.098)	0.066 (0.081)	0.091 (0.087)	0.061 (0.082)
Population (log)	2.000 (1.272)	0.626** (0.266)	0.751*** (0.238)	0.791*** (0.252)	0.820*** (0.275)
Population density (log)	1.782* (0.940)	0.270 (0.252)	0.208 (0.323)	0.168 (0.277)	0.135 (0.338)
Observations	115	115	1266	748	237
Fixed Effects	.	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Rebels' indicators by their municipality of origin

<i>Dependent variable: total episodes of electoral violence</i>					
	OLS		Negative Binomial		
	(1)	(2)	(3)	(4)	(5)
Demob. rebels' polarization (st.)	1.156** (0.497)	0.324*** (0.115)	0.340*** (0.108)	0.340*** (0.109)	0.326** (0.142)
Demob. rebels' fractionalization (st.)	-0.720 (0.521)	-0.222* (0.132)	-0.098 (0.095)	-0.139 (0.107)	-0.080 (0.145)
Hutu share 2012	5.117 (4.792)	0.978 (0.983)	2.785** (1.217)	2.327** (1.177)	3.067* (1.656)
Ethnic fractionalization 2012 (st.)	0.039 (0.645)	-0.062 (0.132)	0.126 (0.159)	0.059 (0.147)	0.144 (0.213)
Political fractionalization 2010 (st.)	-0.082 (0.491)	0.052 (0.135)	0.517*** (0.146)	0.365** (0.148)	0.520** (0.218)
No. demob. (/1000)	-0.284 (0.266)	-0.048 (0.066)	0.019 (0.061)	0.002 (0.065)	0.048 (0.074)
Past violence (log)	0.755 (0.481)	0.175* (0.091)	0.090 (0.102)	0.093 (0.109)	0.056 (0.115)
Median Wealth Index (st.)	0.331 (0.614)	0.022 (0.165)	-0.085 (0.196)	0.011 (0.176)	-0.063 (0.205)
Population (log)	2.565** (1.288)	0.631** (0.256)	1.109*** (0.230)	1.114*** (0.236)	1.157*** (0.287)
Population density (log)	0.832 (0.556)	0.271** (0.126)	0.118 (0.219)	0.131 (0.156)	0.091 (0.243)
Observations			1388	822	256
Fixed Effects	.		All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Instrumenting ethnic diversity

<i>Dependent variable: total episodes of electoral violence</i>				
	(1)	(2)	(3)	(4)
Hutu share 2012	6.776** (2.773)	2.123** (1.046)	4.249*** (1.530)	2.583 (2.678)
Ethnic fractionalization 2012 (st.)	1.003*** (0.381)	0.206 (0.151)	0.559*** (0.209)	0.290 (0.424)
Political fractionalization 2010 (st.)	-0.024 (0.139)	0.310* (0.181)	0.275* (0.153)	0.323 (0.278)
No. demob. rebels (/1000)	-0.093 (0.061)	-0.104** (0.049)	-0.092 (0.059)	-0.074 (0.080)
Demob. rebels' fractionalization (st.)	-0.301** (0.146)	-0.001 (0.145)	-0.106 (0.134)	0.011 (0.261)
Demob. rebels' polarization (st.)	0.544*** (0.132)	0.494*** (0.139)	0.456*** (0.130)	0.546** (0.232)
Past violence (log)	0.369*** (0.104)	0.411*** (0.134)	0.313*** (0.103)	0.346* (0.198)
Median Wealth Index (st.)	0.588*** (0.185)	0.249*** (0.096)	0.461*** (0.125)	0.841* (0.466)
Population (log)	0.946*** (0.268)	1.012*** (0.284)	1.277*** (0.260)	1.098 (0.739)
Population density (log)	0.123 (0.171)	-0.037 (0.231)	-0.070 (0.162)	-0.020 (0.440)
Observations	106	1174	693	215
Fixed Effects	.	All	NFE	Random
<i>First stages</i>				
Hutu share, 1993 elections	0.705*** (0.168)	0.716*** (0.217)	0.754*** (0.161)	0.675*** (0.237)
Controls	Yes	Yes	Yes	Yes
Kleibergen-Paap F-test	17.55	14.814	21.987	2.7

Table 15: OLS

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Demob. rebels' polarization (st.)	1.076** (0.504)	1.002* (0.553)	0.996** (0.478)	1.031 (0.645)
Demob. rebels' fractionalization (st.)	-1.011** (0.490)	-0.192 (0.573)	-0.478 (0.452)	-0.160 (0.654)
Hutu share 2012	3.906 (4.787)	14.326* (8.686)	10.431* (5.954)	16.323* (9.103)
Ethnic fractionalization 2012 (st.)	-0.149 (0.655)	0.492 (1.161)	0.080 (0.808)	0.747 (1.183)
Political fractionalization 2010 (st.)	0.036 (0.442)	2.083** (1.035)	1.438** (0.668)	2.138* (1.146)
No. demob. rebels (/1000)	-0.145 (0.299)	0.114 (0.395)	0.031 (0.286)	0.192 (0.371)
Past violence (log)	0.663 (0.514)	0.563 (0.721)	0.489 (0.576)	0.489 (0.597)
Median Wealth Index (st.)	0.316 (0.530)	-0.293 (0.975)	0.003 (0.700)	-0.343 (0.927)
Population (log)	3.083** (1.333)	5.711*** (2.006)	5.523*** (1.580)	5.178*** (1.622)
Population density (log)	0.863 (0.525)	0.457 (1.077)	0.534 (0.692)	0.288 (1.034)
Observations	128	1388	822	256
Fixed Effects	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 16: Poisson

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Demob. rebels' polarization (st.)	0.325*** (0.117)	0.337*** (0.110)	0.293** (0.122)	0.351*** (0.129)
Demob. rebels' fractionalization (st.)	-0.326** (0.130)	-0.082 (0.116)	-0.120 (0.117)	-0.094 (0.136)
Hutu share 2012	1.308 (1.154)	3.202** (1.330)	2.788** (1.372)	3.718** (1.515)
Ethnic fractionalization 2012 (st.)	-0.032 (0.139)	0.092 (0.168)	0.046 (0.173)	0.160 (0.187)
Political fractionalization 2010 (st.)	0.025 (0.123)	0.349** (0.136)	0.265** (0.135)	0.401*** (0.154)
No. demob. rebels (/1000)	-0.017 (0.070)	0.013 (0.056)	0.001 (0.062)	0.034 (0.057)
Past violence (log)	0.121 (0.116)	0.140 (0.097)	0.082 (0.117)	0.138 (0.094)
Median Wealth Index (st.)	0.070 (0.147)	-0.110 (0.145)	0.014 (0.143)	-0.097 (0.163)
Population (log)	0.823*** (0.293)	0.971*** (0.225)	1.082*** (0.231)	1.033*** (0.256)
Population density (log)	0.238* (0.126)	0.165 (0.197)	0.177 (0.166)	0.098 (0.207)
Observations	128	1388	822	256
Fixed Effects	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 17: Removing bad controls

(a) Without Past Violence

Dependent variable: total episodes of electoral violence

	OLS		Negative Binomial		
	(1)	(2)	(3)	(4)	(5)
Demob. rebels' polarization (st.)	0.958** (0.477)	0.296** (0.116)	0.337*** (0.104)	0.327*** (0.110)	0.346*** (0.124)
Demob. rebels' fractionalization (st.)	-1.142** (0.489)	-0.306** (0.125)	-0.057 (0.106)	-0.124 (0.113)	-0.065 (0.136)
Hutu share 2012	4.532 (5.450)	1.574 (0.991)	3.938*** (1.326)	3.347*** (1.213)	4.414*** (1.577)
Ethnic fractionalization 2012 (st.)	0.056 (0.713)	0.004 (0.129)	0.222 (0.169)	0.154 (0.151)	0.274 (0.189)
Political fractionalization 2010 (st.)	0.372 (0.441)	0.142 (0.122)	0.528*** (0.150)	0.412*** (0.145)	0.585*** (0.187)
No. demob. rebels (/1000)	0.042 (0.224)	0.027 (0.056)	0.047 (0.055)	0.040 (0.056)	0.073 (0.058)
Population (log)	3.764*** (1.331)	0.908*** (0.248)	1.285*** (0.179)	1.312*** (0.191)	1.275*** (0.240)
Population density (log)	0.841* (0.469)	0.228** (0.104)	0.160 (0.213)	0.158 (0.154)	0.100 (0.213)
Median Wealth Index (st.)	0.290 (0.500)	0.070 (0.128)	-0.095 (0.144)	0.004 (0.146)	-0.109 (0.156)
Observations	128	128	1388	822	256
Fixed Effects	.	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

(b) Without Wealth

Dependent variable: total episodes of electoral violence

	OLS		Negative Binomial		
	(1)	(2)	(3)	(4)	(5)
Demob. rebels' polarization (st.)	1.029** (0.503)	0.344*** (0.127)	0.335*** (0.109)	0.316*** (0.113)	0.346*** (0.128)
Demob. rebels' fractionalization (st.)	-1.010** (0.491)	-0.293** (0.129)	-0.120 (0.117)	-0.147 (0.118)	-0.130 (0.135)
Hutu share 2012	3.013 (4.207)	0.904 (0.865)	3.590*** (1.242)	2.982** (1.173)	3.876*** (1.409)
Ethnic fractionalization 2012 (st.)	-0.306 (0.582)	-0.106 (0.116)	0.120 (0.157)	0.054 (0.145)	0.158 (0.173)
Political fractionalization 2010 (st.)	0.131 (0.421)	0.079 (0.115)	0.372*** (0.122)	0.334*** (0.118)	0.414*** (0.144)
No. demob. rebels (/1000)	-0.154 (0.299)	-0.012 (0.062)	0.015 (0.059)	0.005 (0.059)	0.042 (0.058)
Past violence (log)	0.658 (0.517)	0.171* (0.091)	0.137 (0.101)	0.126 (0.103)	0.127 (0.094)
Population (log)	2.865** (1.277)	0.704*** (0.233)	0.998*** (0.235)	0.981*** (0.237)	1.069*** (0.256)
Population density (log)	0.977** (0.445)	0.276*** (0.102)	0.155 (0.180)	0.160 (0.154)	0.096 (0.184)
Observations	129	129	1404	831	258
Fixed Effects	.	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 18: Without Outliers

Dependent variable: total episodes of electoral violence

	OLS		Negative Binomial		
	(1)	(2)	(3)	(4)	(5)
Demob. rebels' polarization (st.)	1.324*** (0.495)	0.399*** (0.111)	0.442*** (0.099)	0.359*** (0.101)	0.475*** (0.123)
Demob. rebels' fractionalization (st.)	-1.128** (0.461)	-0.329*** (0.121)	-0.199** (0.101)	-0.201* (0.109)	-0.254* (0.131)
Hutu share 2012	5.956 (4.060)	1.534* (0.884)	3.668*** (1.150)	2.901*** (1.118)	3.781*** (1.449)
Ethnic fractionalization 2012 (st.)	0.047 (0.556)	-0.015 (0.114)	0.119 (0.152)	0.057 (0.137)	0.140 (0.176)
Political fractionalization 2010 (st.)	0.146 (0.431)	0.089 (0.115)	0.508*** (0.130)	0.376*** (0.132)	0.354** (0.141)
No. demob. rebels (/1000)	-0.219 (0.194)	-0.011 (0.051)	-0.022 (0.049)	-0.020 (0.050)	0.023 (0.055)
Past violence (log)	0.931*** (0.303)	0.200*** (0.070)	0.230*** (0.084)	0.234*** (0.084)	0.159* (0.086)
Median Wealth Index (st.)	0.314 (0.481)	0.067 (0.145)	-0.056 (0.130)	0.008 (0.150)	-0.015 (0.156)
Population (log)	3.261*** (1.177)	0.845*** (0.216)	0.913*** (0.192)	0.944*** (0.204)	1.029*** (0.243)
Population density (log)	1.095*** (0.364)	0.273*** (0.086)	0.390** (0.194)	0.281** (0.141)	0.295 (0.187)
Observations	119	119	1330	786	238
Fixed Effects	.	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 19: Spatial dependence

	Negative binomial				(Spatial) linear regressions			
	Benchmark	Polynomial coord.	Spatial lag violence coord.	Benchmark OLS	WM neighbor Lag	WM neighbor Error	WM coord. Lag	WM coord. Error
	(1)	(2)	(3)	(5)	(6)	(7)	(8)	(9)
Demob. rebels' polarization (st.)	0.347*** (0.126)	0.303** (0.137)	0.340*** (0.127)	1.076** (0.504)	1.085** (0.480)	1.091** (0.472)	0.883 (0.559)	0.706 (0.554)
Demob. rebels' fractionalization (st.)	-0.280** (0.129)	-0.176 (0.140)	-0.294** (0.134)	-1.011** (0.490)	-1.063** (0.474)	-1.083** (0.476)	-0.814 (0.502)	-0.663 (0.456)
Hutu share 2012	1.075 (0.967)	1.784 (1.431)	1.213 (0.952)	3.906 (4.787)	4.218 (4.472)	3.412 (4.428)	2.088 (5.350)	0.265 (5.611)
Ethnic fractionalization 2012 (st.)	-0.079 (0.131)	0.018 (0.154)	-0.069 (0.130)	-0.149 (0.655)	-0.126 (0.620)	-0.163 (0.586)	-0.386 (0.715)	-0.583 (0.739)
Political fractionalization 2010 (st.)	0.051 (0.120)	0.168 (0.145)	0.011 (0.123)	0.036 (0.442)	-0.044 (0.425)	-0.122 (0.478)	0.138 (0.431)	0.183 (0.430)
No. demob. rebels (/1000)	-0.016 (0.060)	0.014 (0.063)	-0.015 (0.060)	-0.145 (0.299)	-0.137 (0.285)	-0.154 (0.272)	-0.183 (0.274)	-0.199 (0.264)
Past violence (log)	0.178* (0.091)	0.118 (0.107)	0.180** (0.091)	0.663 (0.514)	0.649 (0.492)	0.684 (0.471)	0.605 (0.497)	0.601 (0.478)
Median Wealth Index (st.)	0.057 (0.146)	0.082 (0.148)	0.073 (0.141)	0.316 (0.530)	0.370 (0.487)	0.344 (0.476)	-0.074 (0.596)	-0.214 (0.516)
Population (log)	0.736*** (0.245)	0.944*** (0.282)	0.669*** (0.259)	3.083** (1.333)	2.976** (1.268)	2.866** (1.348)	3.682** (1.497)	4.298*** (1.522)
Population density (log)	0.258** (0.115)	0.262* (0.151)	0.283** (0.120)	0.863 (0.525)	0.906* (0.515)	0.871* (0.481)	0.182 (0.864)	-0.492 (0.770)
Latitude		0.183 (0.200)						
Latitude ²		-0.005 (0.085)						
Latitude ³		-0.019 (0.053)						
Longitude		-0.162 (0.238)						
Longitude ²		-0.148* (0.081)						
Longitude ³		0.027 (0.053)						
Spatial lag total episodes			-0.201 (0.162)					
Observations	128	128	128	128	128	128	128	128
Fixed Effects								

Clustered-robust standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 20: Placebo tests

	<i>Dependent variable: total episodes of electoral violence</i>									
	Age-groups					Religion				
	OLS (1)	(2)	(3)	Negative Binomial (4)	(5)	OLS (6)	(7)	(8)	Negative Binomial (9)	(10)
Age-group polarization (st.)	-0.423 (0.383)	-0.083 (0.102)	-0.170** (0.075)	-0.148* (0.080)	-0.144* (0.085)	-0.338 (0.372)	-0.096 (0.092)	-0.004 (0.087)	-0.046 (0.086)	-0.009 (0.091)
Religious polarization (st.)										
Demob. rebels' fractionalization (st.)	-0.288 (0.439)	-0.023 (0.102)	0.196** (0.084)	0.113 (0.090)	0.187* (0.101)	-0.323 (0.443)	-0.040 (0.105)	0.188** (0.086)	0.101 (0.091)	0.166 (0.103)
No. demob. rebels (/1000)	-0.136 (0.300)	-0.019 (0.064)	0.040 (0.059)	0.024 (0.058)	0.061 (0.059)	-0.160 (0.301)	-0.020 (0.065)	0.035 (0.060)	0.021 (0.059)	0.022 (0.053)
Hutu share 2012	1.483 (4.593)	0.495 (0.998)	2.428* (1.334)	2.139 (1.318)	2.975* (1.521)	1.583 (4.539)	0.572 (0.942)	2.908** (1.290)	2.418* (1.245)	3.213** (1.509)
Ethnic fractionalization 2012 (st.)	-0.278 (0.675)	-0.073 (0.140)	0.113 (0.170)	0.052 (0.164)	0.166 (0.181)	-0.305 (0.675)	-0.077 (0.135)	0.127 (0.168)	0.069 (0.158)	0.138 (0.183)
Political fractionalization 2010 (st.)	0.044 (0.465)	0.019 (0.132)	0.543*** (0.153)	0.405*** (0.148)	0.571*** (0.187)	0.006 (0.460)	0.017 (0.132)	0.513*** (0.145)	0.364** (0.143)	0.379** (0.151)
Past violence (log)	0.587 (0.498)	0.150 (0.092)	0.127 (0.100)	0.125 (0.101)	0.129 (0.097)	0.581 (0.506)	0.140 (0.094)	0.122 (0.104)	0.112 (0.105)	0.140 (0.095)
Median Wealth Index (st.)	0.035 (0.477)	-0.026 (0.155)	-0.237 (0.146)	-0.114 (0.146)	-0.229 (0.157)	0.192 (0.566)	0.033 (0.167)	-0.153 (0.164)	-0.027 (0.161)	-0.096 (0.158)
Population (log)	2.962** (1.451)	0.655** (0.280)	1.087*** (0.249)	1.068*** (0.244)	1.075*** (0.264)	3.017** (1.506)	0.711** (0.304)	1.040*** (0.256)	1.077*** (0.258)	0.923*** (0.282)
Population density (log)	0.882* (0.526)	0.276** (0.125)	0.064 (0.194)	0.100 (0.155)	0.002 (0.196)	0.926* (0.533)	0.277** (0.125)	0.082 (0.210)	0.119 (0.159)	0.016 (0.192)
Observations	128	128	1388	822	256	128	128	1388	822	256
Fixed Effects	.	.	All	NFE	Random	.	.	All	NFE	Random

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 21: Falsification: Yearly records of attacks against civilians

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Demob. rebels' polarization (st.)	-0.373** (0.187)	0.522* (0.301)	0.427 (0.441)	0.226 (0.217)	0.346** (0.145)	-0.161 (0.224)	0.078 (0.246)	-0.391 (0.345)	0.392 (0.309)	-0.283 (0.399)	0.578 (0.483)	-0.028 (0.300)	-1.296 (9.164)
Demob. rebels' fractionalization (st.)	0.738*** (0.184)	-0.185 (0.330)	-0.400 (0.519)	-0.424** (0.178)	-0.206 (0.157)	0.211 (0.226)	-0.212 (0.293)	0.003 (0.347)	-0.150 (0.367)	-0.163 (0.520)	0.142 (0.556)	0.052 (0.350)	2.193 (8.623)
Hutu share 2012	7.530** (3.214)	6.794** (2.803)	0.169 (2.325)	2.279 (2.374)	2.633 (1.713)	6.139*** (2.273)	7.688*** (2.561)	0.641 (3.458)	1.256 (3.489)	15.825*** (4.555)	0.307 (5.421)	14.409*** (4.679)	25.785 (49.777)
Ethnic fractionalization 2012 (st.)	0.959*** (0.324)	0.727** (0.350)	1.143*** (0.313)	0.452* (0.249)	0.412** (0.186)	0.852*** (0.280)	0.405*** (0.202)	-0.898** (0.439)	0.438 (0.267)	0.368 (0.376)	-0.403 (0.397)	0.491 (0.383)	1.218 (6.624)
Political fractionalization 2010 (st.)	1.447*** (0.407)	-0.397 (0.542)	-0.251 (0.467)	0.093 (0.279)	-0.045 (0.255)	0.600** (0.294)	0.013 (0.315)	-0.521 (0.483)	0.128 (0.418)	-0.573 (0.518)	-1.008 (0.654)	0.125 (0.419)	3.042 (14.869)
No. demob. rebels (/1000)	0.425*** (0.085)	-0.019 (0.123)	0.232* (0.139)	0.012 (0.066)	0.034 (0.061)	0.279*** (0.069)	0.021 (0.072)	-0.627*** (0.159)	0.142 (0.099)	0.142* (0.086)	0.094 (0.154)	0.019 (0.114)	0.543 (1.769)
Median Wealth Index (st.)	-1.397* (0.742)	0.128 (0.361)	0.335 (0.315)	0.073 (0.241)	-0.409** (0.168)	0.227 (0.210)	0.071 (0.254)	-3.398*** (0.814)	0.235 (0.329)	0.318 (0.451)	-0.911 (0.601)	-1.628 (1.082)	-21.905 (.)
Population (log)	-0.084 (0.456)	1.722*** (0.637)	2.287*** (0.868)	2.295*** (0.333)	1.780*** (0.293)	1.527*** (0.384)	1.411*** (0.464)	-0.708 (0.627)	3.263** (1.272)	0.637 (1.145)	0.590 (1.010)	1.150 (1.027)	0.672 (9.268)
Population density (log)	0.511 (0.447)	1.123*** (0.244)	0.930*** (0.270)	-0.034 (0.241)	0.311* (0.167)	0.271 (0.217)	1.260*** (0.225)	1.404*** (0.307)	0.314 (0.271)	1.500*** (0.456)	0.271 (0.623)	1.221** (0.526)	9.398** (4.450)
Observations	822	822	822	822	822	822	822	822	822	822	822	822	822
Fixed Effects	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 22: Falsification: Yearly records of battles

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Demob. rebels' polarization (st.)	-0.223 (0.240)	-0.654** (0.288)	-0.403 (0.311)	-0.186 (0.191)	-0.122 (0.132)	0.041 (0.155)	0.336* (0.195)	-0.514 (0.315)	0.765*** (0.203)	0.233 (0.337)	0.562 (0.413)	0.587 (0.365)	0.510** (0.224)
Demob. rebels' fractionalization (st.)	0.199 (0.249)	0.609** (0.275)	0.288 (0.308)	-0.160 (0.188)	-0.083 (0.137)	-0.057 (0.169)	-0.115 (0.215)	0.585 (0.488)	-0.215 (0.253)	0.522* (0.303)	-0.456 (0.408)	-0.444 (0.379)	-0.101 (0.245)
Hutu share 2012	6.337*** (2.288)	7.380*** (2.786)	2.640 (3.312)	-5.061*** (1.724)	-0.582 (2.070)	2.710* (1.503)	3.183** (1.588)	7.585* (4.117)	6.495** (2.644)	4.944 (4.119)	-10.926*** (3.581)	4.189 (4.121)	0.978 (2.685)
Ethnic fractionalization 2012 (st.)	0.658*** (0.190)	0.631** (0.270)	0.478 (0.300)	-0.461** (0.223)	-0.157 (0.224)	0.441** (0.210)	0.192 (0.174)	0.873** (0.380)	1.186*** (0.238)	0.302 (0.384)	-0.918** (0.447)	0.184 (0.329)	0.036 (0.310)
Political fractionalization 2010 (st.)	1.110*** (0.283)	0.664 (0.414)	0.581* (0.337)	0.011 (0.261)	0.301 (0.208)	0.585*** (0.214)	-0.077 (0.254)	2.459*** (0.782)	0.604* (0.311)	-0.147 (0.359)	-2.086*** (0.690)	-0.290 (0.670)	-0.138 (0.393)
No. demob. rebels (/1000)	0.216*** (0.064)	0.180** (0.082)	0.079 (0.113)	0.041 (0.067)	0.035 (0.065)	0.107** (0.053)	-0.107* (0.057)	0.118 (0.140)	0.315*** (0.079)	0.068 (0.068)	-0.102 (0.136)	0.091 (0.092)	-0.007 (0.105)
Median Wealth Index (st.)	-2.194*** (0.588)	-0.898 (0.747)	-0.781 (0.485)	-0.365 (0.243)	0.136 (0.144)	0.301* (0.178)	-0.077 (0.292)	-1.970* (1.075)	0.644** (0.252)	-0.067 (0.361)	0.280 (0.266)	0.692** (0.344)	0.117 (0.250)
Population (log)	0.872** (0.404)	2.040*** (0.461)	2.261*** (0.532)	1.630*** (0.369)	1.605*** (0.267)	1.709*** (0.313)	2.051*** (0.344)	2.201** (1.064)	2.959*** (0.603)	1.167* (0.617)	1.300 (0.849)	2.519*** (0.862)	1.504*** (0.544)
Population density (log)	1.371*** (0.336)	0.633 (0.441)	1.162*** (0.295)	0.061 (0.180)	-0.072 (0.149)	0.182 (0.175)	0.686*** (0.194)	0.918** (0.394)	0.501** (0.236)	0.116 (0.383)	-0.336 (0.391)	0.856** (0.344)	0.174 (0.218)
Observations	822	822	822	822	822	822	822	822	822	822	822	822	822
Fixed Effects	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE

Clustered-robust standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$