From Rebellion to Electoral Violence: Evidence from Burundi*

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Abstract

What causes electoral violence in post-conflict countries? Using a unique dataset on electoral violence in Burundi, we test if electoral violence is driven by (1) ethnic composition and ethnic grievances, (2) political competition or (3) the presence and distribution of demobilized rebels as "specialists in violence". We study variations in the intensity of electoral violence between neighboring municipalities, relying on the fact that they are more likely to have similar unobserved characteristics. We find that ethnic diversity is not associated with electoral violence in post-conflict Burundi, which goes against the commonly held view that this factor necessarily plays a key role in violence in the region. Rather, we show that electoral violence is higher in municipalities characterized by acute polarization between ex-rebel groups, fierce political competition and a high proportion of Hutu. The effect of political competition is stronger in the presence of numerous ex-rebels.

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

JEL Classification: D74, O12, O17, O55

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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 are indeed expected to increase legitimacy and accountability of the newly elected governments and foster social trust in war-torn societies, thus contributing to long-lasting peace and sustainable development. Nonetheless, elections failed to be implemented properly in a vast majority of countries in Africa. During the 1975-2011 period, no less than 80% of African polls were disturbed 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 failed democratic transitions is all the more important in view of their devastating effects on the living conditions of civilians. Furthermore, failed transitions undermine the legitimacy of the States, destroy social capital and result in poor economic and political performance, which can ultimately plunge fragile countries back into war[2].

In which context is electoral violence likely to emerge? This paper tests three hypotheses that have already been discussed in the literature on civil conflict, but never simultaneously tested in the context electoral violence: (1) ethnic composition and ethnic grievances, (2) political competition and (3) the presence and distribution of "specialists in violence".

First, a vast literature has studied how ethnic grievances may foster violence and affect the provision of public goods (see e.g. Easterly and Levine (1997); Alesina et al. (1999); Garcia-Montalvo and Reynal-Querol (2005a)). Popular resentment is likely to be exacerbated during electoral periods as elites have been shown to exploit ethnic allegiances to seize political power (Eifert et al., 2010). Second, economists have shown theoretically that violent campaigning may be an optimal strategy for political actors, depending on their position (incumbent versus opponent) and their relative support among the population (Collier and Vicente, 2012; Robinson and Torvik, 2009; Chaturvedi, 2005;

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

[2] Electoral violence has been shown to have damaging consequences on civilians (see e.g. Dupas and Robinson (2012, 2010) and Omotola (2010)), on legitimacy (Berman et al., 2014), on social capital (Dercon and Gutiérrez-Romero, 2012), on economic and political consequences (Collier and Hoeffler, 2015; Kudamatsu, 2012; Chauvet and Collier, 2009) and on relapse into conflict (Brancati and Snyder, 2012; Hegre et al., 2001; Henderson and Singer, 2000).

Ellman and Wantchekon, 2000). According to theory, violence is more likely to occur when political competition is intense such that intimidation and electoral violence can reverse electoral outcomes. Third, the theoretical literature has emphasized the important role played by "specialists in violence" (Chaturvedi, 2005) or "hardcore supporters" (Collier and Vicente, 2012). In post-conflict countries, demobilized combatants, whose factions often turn into political parties after civil war, are good candidates for playing such a 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 these three hypotheses in the context of the 2010 electoral cycle in Burundi. Our study exploits a unique dataset combining information at the municipal level on electoral violence, ethnic composition, electoral results and the affiliation and distribution of demobilized rebels who fought during the 1993-2009 civil war. In line with the conflict literature, we use and compare different indexes of fractionalization and polarization[3]. The identification strategy exploits variations between neighboring municipalities, relying on the fact that these are more likely to have similar unobserved characteristics.

Three important conclusions can be drawn from our empirical analysis. First, ethnic grievances, while traditionally indicated as one of the main drivers of violence, are not significantly related to the incidence of electoral violence in 2010. Instead, electoral violence was higher in municipalities hosting a larger proportion of Hutu. Second, political competition between parties is a strong predictor of electoral violence. An increase of one standard deviation in political fractionalization leads to 45% more violent events. This relationship is stronger in places with numerous demobilized rebels: for political competition to turn violent, the presence of local perpetrators seems necessary. Last but not least, we find that polarization between ex-rebel groups is associated with more electoral violence. A one standard deviation increase in polarization among rebel groups leads 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. Overall, the causes of tensions and violence in Burundi seem to have evolved from an inter-ethnic to an intra-Hutu rivalry between ex-rebel groups and political parties competing for power. These results are robust to a variety of estimation strategies.

Our paper contributes to three strands of the literature. First, we complement the few empirical studies on electoral violence. Focusing on the 2007 elections in Kenya, Dercon and Gutiérrez-Romero (2012) 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

[3]Fractionalization measures the probability that two individuals drawn at random from a community belong to two different groups. It is high in the presence of many groups of similar size. Polarization measures the distance of a particular distribution of groups to a bimodal distribution. It is high in the presence of two groups of similar size.

likely to win, in order *"to weaken the support of their political rivals and to mobilize their own"*. Collier and Vicente (2014) recently evaluated a randomized anti-violence community campaign in Nigeria. They find that the intervention decreased the intensity of violence and increased voter turnout. Fafchamps and Vicente (2013) further show that the effects of the campaign were also transmitted indirectly through kinship and geographical proximity. Developing a better understanding of the causes of electoral violence should help for the design and targeting of anti-violence campaigns.

Second, our analysis contributes to the large literature studying how polarization and fractionalization between groups can foster conflict[4]. The explanatory power of fractionalization and polarization indexes have been compared in a few studies examining the link between ethnic distribution and conflict (Garcia-Montalvo and Reynal-Querol, 2005a,b; Schneider and Wiesehomeier, 2008; Esteban et al., 2012a). To our knowledge, this paper is the first to use fractionalization and polarization indexes to capture tensions between ex-rebel groups. It is also the first to jointly test if electoral violence is affected by the relative distribution of ethnic groups, political parties and "hardcore supporters".

Finally, our study also contributes to the body of research that assesses the effectiveness of demobilization programs in post-conflict societies (D'Aoust et al., 2014; Gilligan et al., 2013; Verwimp and Bundervoet, 2009; Humphreys and Weinstein, 2007). Our paper is the first empirical study that evaluates the impact of ex-combatants' demobilization on the recurrence of outbursts of violence.

In addition to these contributions, we emphasize the importance of understanding the causes of violence in Burundi. The history of the Great Lake region has shown that political instability in one country of the region may destabilize the whole area, with dramatic effects on civilian population (Prunier, 2009). As its neighbors Rwanda and DRC, Burundi has been plagued by violence and tensions between the Tutsi minority and the Hutu majority since its independence. As a matter of fact, the 1993 elections in Burundi - the first to be organized after a long Tutsi-led dictatorship - resulted in the assassination of the newly elected Hutu president by Tutsi officers during an attempted coup. The assassination triggered a long-lasting civil war leaving around 300,000 deaths, mostly civilians, and about 800,000 refugees who fled in DRC, Rwanda and Tanzania. In the Eastern provinces of the DRC, refugee camps became military bases. These events exacerbated tensions in the Great Lake region, paving the way for the Rwandan Genocide and the Second Congo War (Lemarchand, 2009; Mamdani, 2001). The 2010 polls were the first to be organized after the civil war and the demobilization of all rebel groups in Burundi. As we write this paper, violence erupted again in prelude to the 2015 electoral campaign, leading to dozens of deaths and thousands of refugees, highlighting once again

[4]See Esteban and Ray (2008), Schneider and Wiesehomeier (2008) and Blattman and Miguel (2010) for reviews of the literature and Esteban and Ray (2008, 2011) for recent models comparing fractionalization and polarization indexes.

the importance of unveiling the mechanisms of electoral violence.

The paper is organized as follows. The history of Burundi and the context of the 2010 elections are introduced in Section 2. In Section 3, we lay out and justify research hypotheses by referring to the theoretical literature on conflict and electoral violence. Section 4 describes the dataset and the econometric methods used in the empirical analysis. Results are presented in Section 5 and are discussed in Section 6. Section 7 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 Hutu majority and the Tutsi minority[5]. After a short democratic transition, a group of Tutsi officers seized power in 1966 following contested elections won by the Hutu majority. From 1966 to 1988, three Tutsi presidents from the same party[6] and the same village in the Southwestern province of Bururi governed the country and violently repressed any Hutu rebellion.

In 1988, a democratization process was initiated under the pressure of the international community. A new constitution introduced multiparty competition after 20 years of Tutsi regime. Melchior Ndadaye, from the Hutu-based party FRODEBU[7], triumphed in the elections of 1993 and set up a government of power-sharing. His assassination a few months later by Tutsi officers and the death of the *ad interim* President Cyprien Ntaryamina in the 1994 plane crash in Rwanda[8] triggered a civil war opposing the Tutsi-controlled army and radical Hutu groups. The already doomed democratization process was definitely buried in July 1996 when the Tutsi-controlled army led by former Tutsi president Buyoya overthrew the power-sharing government.

A fragile peace was reached through the Arusha Peace and Reconciliation Agreement on August 28, 2000. The Arusha Agreements institutionalized power sharing across ethnicities by designing an ethnically-mixed transitional government and imposing ethnic quotas in institutions and political parties. However, the two largest Hutu rebel groups, the CNDD-FDD and the FNL-Palipehutu[9] rejected the peace accords and continued to fight the government of transition. The CNDD-FDD eventually signed a Comprehensive

[5]According to the 2012 Afrobarometer survey, 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.

[6]The Union for National Progress (Union pour le Progrès National, or UPRONA)

[7]The Front for Democracy in Burundi (Front pour la Démocratie du Burundi)

[8]The airplane carrying the Burundian president Cyprien Ntaryamira and its Rwandan counterpart, Juvénal Habyarimana was shot down as it prepared to land in Kigali on April 6, 1994. This attack triggered the Rwandan Genocide.

[9]The National Council for the Defense of Democracy - Forces for the Defense of Democracy (Conseil National de Défense de la Démocratie - Forces de Défense de la Démocratie, or CNDD-FDD) and the National Forces of Liberation (Forces Nationales de Libération, or FNL-Palipehutu)

Ceasefire Agreement in 2003 and joined the power-sharing government. Combatants from the Burundian Armed Forces (Forces Armées Burundaise, or FAB) and from the CNDD-FDD were selected to form the new national army (National Defense Force or Forces de Défense Nationale (FDN)). Those who did not fulfill 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 (almost three demobilized soldiers per thousand inhabitants) 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"* (The World Bank Group, 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 continued to fight the government, definitely transforming what had been an inter-ethnic war into a intra-Hutu struggle for power[10]. 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 year earlier, its combatants either joined the national army or benefited from the DDR program.

Elections were scheduled in 2010, only few months after the 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 in early September. Even if several opposition parties seemed confident in their success, the FNL party was seen as the most serious opposition to the CNDD-FDD of the incumbent president Pierre Nkurunziza (International Crisis Group, 2011). Table 1 displays the names of main parties, their creation dates, their ethnic origin, their results at the municipal election and, for ex-rebels groups, their numbers of demobilized rebels.

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, capturing 64% of the votes and 62% of the 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 of massive frauds and irregularities (Vandeginste, 2012; International Crisis Group, 2011). Opposition parties withdrew their candidacy for other ballots (Helbig de Balzac et al., 2011), leaving Nkurunziza as the only candidate running for presidency.

[10]See e.g. Palmans (2012), Vandeginste (2011, 2012, 2014) and International Crisis Group (2011).

Table 1: Parties and ex-rebel groups

Party	Year of creation	Ethnicity of leader	% of votes in 2010	Ex-rebel group	No. of demob. (share)	Correlation votes & share demob.
CNDD-FDD	1998	Hutu	64.03	Yes	6874 (39%)	0.59
FNL	1999	Hutu	14.15	Yes	6029 (34.2%)	0.57
UPRONA	1957	Tutsi	6.25	No		
FRODEBU	1986	Hutu	5.43	No		
MSD	2009	Tutsi	3.75	No		
UPD	2003	Hutu	2.21	No		
FRODEBU-Nyakuri	2008	Hutu	1.36	No		
CNDD	1994	Hutu	1.26	Yes	1372 (7.8%)	0.76
MRC	2001	Tutsi	0.62	No		
PALIPE-Agakiza	1980	Hutu	0.24	Yes	578 (3.3%)	0.02
FROLINA	1990	Hutu	0.20	Yes	540 (3.1%)	0.31
KAZE-FDD	2005	Hutu	0.00	Yes	361 (2%)	-0.04
FNL dissidents		Hutu	-	Yes	1594 (9%)	-
FNL Icanzo	2001	Hutu	-	Yes	278 (1.6%)	-

National Council for the Defense of Democracy-Forces for the Defense of Democracy, National Front for Liberation (FNL), Union for National Progress (UPRONA), Front for Democracy in Burundi (FRODEBU), Movement for Solidarity and Democracy (MSD), Union for Peace and Democracy-Zigamibanga (UPD), Front for Democracy in Burundi-Nyakuri (FRODEBU-Nyakuri), National Council for the Defense of Democracy (CNDD), Movement for the Rehabilitation of Citizens-Rurenzangemero (MRC), Party for the Liberation of People-Agakiza (PALIPE-Agakiza), National Liberation Front (FROLINA), Kaze-Forces for the Defense of Democracy (KAZE-FDD)

The incumbent president was re-elected with 95% of the votes. Violence continued to be pervasive until the end of the electoral process.

The 2010 elections legitimized a quasi-return to the single-party rule, the CNDD-FDD having obtained a three-quarters majority in the National Assembly[11]. Political tensions therefore increased, leading to the resurgence of rebel groups - among which the FNL - aiming to fight the government (International Crisis Group, 2012). Many opposition leaders left the country after complaining about constant harassment and threats to their lives. Several of those who remained politically active were arrested or assassinated. Media and civil society were threatened, increasing the risk of instability and insecurity (Vandeginste, 2012). In this volatile context, the country is going through a new electoral round in 2015.

3 Conceptual framework

Our paper aims at understanding the causes of violence that perturbed the electoral process in Burundi in 2010. We test if electoral violence was driven by (1) ethnic composition and ethnic grievances, (2) political competition and (3) the presence and the distribution of "specialists in violence". This section draws on the literature on conflicts and electoral violence to explain why these channels could be relevant to explain electoral violence in Burundi.

[11]Despite the boycott, two parties decided to take part in the legislative elections in addition to the CNDD-FDD: Frodebu Nyakuri and UPRONA. They could send deputies at the National Assembly (Helbig de Balzac et al., 2011).

First, the literature on conflict has shown that ethnic distribution is likely to be correlated with violence. As explained in the previous section, the post-colonial history of Burundi has been plagued by ethnic tensions between the Hutu and the Tutsi. This inter-ethnic rivalry eventually triggered a bloody civil war in the Nineties, partially resolved with the Arusha Peace Agreements. It is reasonable to assume that such deeply rooted ethnic cleavages might have survived the democratic transition, eventually transposed into the young political arena and exploited by candidates during electoral campaigns (Wilkinson, 2004; Eifert et al., 2010).

Two mechanisms could be at play. First, the theoretical literature has shown that violence is more likely to emerge if the distribution of ethnic groups is either polarized or fractionalized (Esteban and Ray, 2008, 2011). The ethnic distribution is said to be polarized if there are only two groups of similar size, and fractionalized if there are many groups of similar importance. Empirical evidence is mixed. While Garcia-Montalvo and Reynal-Querol (2005a,b) argue that ethnic polarization best captures the likelihood of conflict, Schneider and Wiesehomeier (2008) and Esteban et al. (2012a,b) finds that both ethnic fractionalization and ethnic polarization are conducive to conflict, depending on the political regime and the nature of the conflict.

However, a second mechanism could also be at play. Around 85% of the population is Hutu in Burundi. It implies that a Hutu president is expected to rule the country after the elections[12]. Given the high stakes involved, electoral violence could be more likely in areas where the Hutu are the majority. This is also in line with the fact that the civil war in Burundi evolved from an inter-ethnic conflict to an intra-hutu struggle for power. On the contrary, Tutsi parties and Tutsi municipalities are less likely to be key for determining who would win the elections, making them less prone to engage in violence.

We consider two indicators to capture the two mechanisms: an indicator of ethnic fractionalization[13] and the proportion of Hutu. If the first mechanism prevails, ethnic fractionalization should be positively correlated with violence. If the second mechanism dominates, violence should be positively correlated with the proportion of Hutu.

Second, we test how political competition could foster electoral violence. As explained in the historical review, the Arusha Agreements institutionalized power sharing across ethnicities and imposed ethnic quotas in political parties. The 2010 elections might therefore have been spoiled by intense political competition, rather than by ethnic tensions. As for ethnicity, two mechanisms can be at play. On the one hand, parties may engage in

[12]Palmans (2012) and Vandeginste (2011) report that *"for the majority of the population (an estimated 85% of whom are Hutu) legitimacy goes hand in hand with an ethnically representative leader."*

[13]There are only two main ethnic groups in Burundi: the Hutu and the Tutsi. The third ethnic group, the Twa, represents only 1% of the population. In the analysis, we only consider Hutu and Tutsi, implying that ethnic fractionalization and polarization indexes are proportional and hence perfectly multicollinear. Even if we would consider the Twa, it would not solve the multicollinearity problem as this group is marginally represented.

violence if the political context is heavily fragmented or polarized. In these situations, violence or intimidation can indeed be beneficial to gain a small political advantage, which can ultimately be decisive for winning the elections (Sterck, 2015). On the other hand, the theoretical models of Collier and Vicente (2012) and Chaturvedi (2005) conclude that intimidation or violence can be optimal for political parties which are initially weak. In their models, violent campaigning is used by parties to discourage rival's supporters from voting. For a party, the gain from violent campaigning is therefore increasing in the initial support of its rival, implying that violence is a strategy of the weak against the strong. These two mechanisms lead to very different predictions regarding indexes of political polarization and fractionalization. If the former mechanism is stronger, political fractionalization or polarization should be positively correlated with electoral violence. On the contrary, political fractionalization and polarization should be negatively correlated with electoral violence if the latter mechanism prevails.

Finally, we examine if "hardcore supporters" of parties or "specialists in violence" played an important role in triggering electoral violence. In Chaturvedi (2005), Collier and Vicente (2012) and Sterck (2015), conflictual campaigning is more effective in the presence of numerous "specialists in violence". In the context of post-conflict Burundi, demobilized ex-combatants are likely to play this role. This is plausibile for at least three reasons. After the civil war, most rebel groups turned into political parties, and the literature suggests that demobilized soldiers are active in the post-war political life of their country (Gilligan et al., 2013; Annan et al., 2011; Goose and Smyth, 1994). Demobilized ex-combatants might also be more likely to engage in violence given their past histories. Finally, in a context of widespread poverty and unemployment, they may have higher incentives to support their former leader (Human Rights Watch, 2010). We will therefore test if the number and the distribution of demobilized ex-rebels is correlated with electoral violence. However, given the limitation of our data, we will not be able to determine when violence is used to gain electoral advantage, and when it is the mere consequence of frustrations among demobilized rebels that are resurfacing during the elections. We measure the distribution of former combatants by using indexes of polarization and fractionalization of demobilized combatants.

While the literature agrees that the distribution of religious, ethnic or political groups has an impact on the likelihood of conflict, it has not reached a consensus on whether conflict is the result of fractionalization or polarization[14]. In our paper, we will therefore compare the predictive power of indexes of fractionalization and polarization related

[14]Most of the theoretical literature has been written by Joan Esteban and Debraj Ray (see Esteban and Ray (2008, 2011) for recent examples comparing fractionalization and polarization indexes). See e.g. Esteban and Ray (2008), Schneider and Wiesehomeier (2008) and Blattman and Miguel (2010) for reviews of the literature. See Garcia-Montalvo and Reynal-Querol (2005a,b), Schneider and Wiesehomeier (2008) and Esteban et al. (2012a,b) for contradictory evidence on the effect of ethnic polarization and ethnic fractionalization on conflict.

to political parties and demobilized rebel groups. The recent findings of Esteban and Ray (2011) and Esteban et al. (2012a,b) are however worth emphasizing. They show theoretically and empirically that polarization is more conducive of violence than fractionalization *"when the winners enjoy a public prize"* such as political power or religious hegemony. The contrary is true when the prize is "private", such as looted resources. Their results imply that electoral violence should be driven by polarization.

These three hypotheses are of course related in the context of Burundi. As shown in Table 1, most political parties and rebel groups are ethnically rooted, and many parties are issued from demobilized rebel groups. Nevertheless, the three hypotheses capture different aspects of the political environment of Burundi and will therefore be distinguished in the empirical analysis. The correlation between electoral results of former rebel groups and the share of demobilized ex-rebels coming from their group is high but far from perfect. Many parties have no demobilized ex-combatants and their ethnic orientations are different. This implies that the correlations between our variables of interest is rather limited. For example, the correlation between political fractionalization and the proportion of Hutu at the municipal level is equal to -0.41. The correlation between political fractionalization and fractionalization between ex-rebels is only equal to 0.01, and only 0.08 for polarization indexes (Table A.1 in Appendix). The three hypotheses can therefore be tested simultaneously.

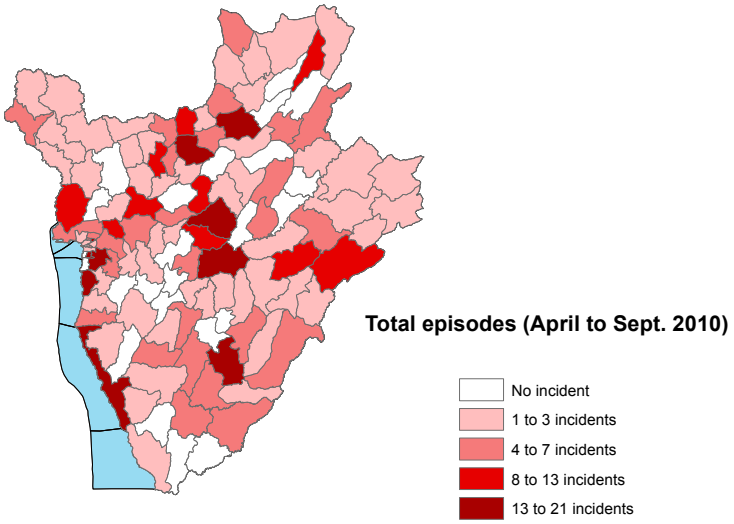
4 Identification strategy

In order to test the three hypotheses, we estimate the following model:

$$\begin{aligned} \text{Violent episodes}_m = \alpha_m &+ \beta_1 \text{ Hutu share}_m + \beta_2 \text{ ethnic frac.}_m \\ &+ \phi_1 \text{ political pol.}_m + \phi_2 \text{ political frac.}_m \\ &+ \gamma_1 \text{demob. rebels' pol.}_m + \gamma_2 \text{ demob. rebels' frac.}_m \\ &+ \gamma_3 \text{ number demob. rebels'}_m + \mathbf{X}'_m\delta + Z_k + \epsilon_m, \end{aligned} \tag{1}$$

where *Violent episodes*$_m$ is the number of episodes of electoral violence which occurred in each municipality $m \in [1, 129]$. *Hutu share*$_m$ and *ethnic frac.*$_m$ capture the ethnic distribution between Hutu and Tutsi. Political competition is measured by fractionalization and polarization indexes based on 2010 municipal elections' results (*political frac.*$_m$ and *political pol.*$_m$). *Demob. rebels' frac.*$_m$ and *demob. rebels' pol.*$_m$ are indexes of fractionalization and polarization between demobilized rebels at the municipal level. *Number demob. rebels'*$_m$ captures the number of demobilized rebels who returned in the municipality per 1000 inhabitants. $\mathbf{X}_m$ is a vector of covariates which includes a median wealth

Figure 1: Distribution of electoral violence



index, population, population density and past violence[15]. Z_k are fixed effects. Summary statistics are shown in Table 2.

4.1 Data

Electoral violence The measure of electoral violence is constructed using the Burundi *Ushahidi* electoral violence dataset[16]. During the 2010 electoral process in Burundi, 450 trained monitors, on average 3.5 per municipality, verified and recorded electoral violence incidents[17] (Amatora Mu Mahoro, 2010). Information about physical violence, destruction of property, clashes between groups and intimidation during the electoral cycle were recorded between April, 26 and September 12, 2010. Descriptive statistics are presented in Table 2. 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.

Ethnic cleavages. Ethnicity is a sensitive matter. It is therefore challenging to obtain ethnic data either because it is no longer collected 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.

[15]Past 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.

[16]The *Ushahidi* ("testimony") software was developed to map reports of violence in Kenya after the post-election fallout in 2007-2008. It was then adapted to the Burundian context through the *Amatora mu Mahoro* ("Elections in Peace") project. It also draws on the Elections Violence Education and Resolution (EVER) project which gathers information on incidents of violence and peace activities and was conducted in a dozen countries since 2003 (IFES, 2010).

[17]http://www.burundi.ushahidi.com/main

Table 2: Summary Statistics

	Mean	St. Dev.	Min	Median	Max	N
Violent episodes	4.02	4.52	0	3	21	129
Demobilized rebels						
Demobilized rebels' polarization	0.58	0.18	0	0.60	1	129
Demobilized rebels' fractionalization	0.54	0.16	0	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	35	350	129
CNDD	10.64	35.76	0	2	348	129
Palipe Agazika	4.48	11.66	0	0	74	129
Frolina	4.19	20.09	0	0	208	129
KAZE-FDD	2.80	6.23	0	1	58	129
FNL Icanzo	2.16	8.16	0	0	74	129
FNL - Rwasa	46.74	55.61	1	29	275	129
FNL Dissidents	12.36	37.42	0	3	326	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	-15144	91514	-55170	-41004	545315	128
Total violence (1997-2009)	20.40	37.68	0	9	357	129
Attacks on civilians (1997-2009)	10.97	21.09	0	3	177	129
Battles (1997-2009)	9.43	18.12	0	5	180	129
Population (2008 census)	62431	26454	17481	57284	155005	129
Population Density	1235	4174	72.34	352	33831	129

The 2012 Afrobarometer survey did however collect and release data on ethnicity 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 municipalities[18], an indicator of ethnicity computed at the municipal level would suffer from a mismeasurement problem, leading to attenuation bias (Hausman, 2001). Descriptive statistics in Table 2 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 consider the proportion of Hutu itself. Second, we construct an index of ethnic fractionalization following

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

Alesina et al. (2003):

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

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 group[19].

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 (2005b) index of ethnic polarization by considering the absolute rather than the quadratic value of the term in the sum. By doing so, we avoid putting excessive weights on outlying municipalities[20]:

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

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 $\textit{Political polarization}_m = 1$ indicating a bipolar political scenario.

Estimates could potentially suffer from a reverse causality bias because the measures of political competition are based on the results of the municipal election in 2010. As explained in Section 4.3, we use two strategies to prevent this source of bias. First, we will use the results of the 2005 municipal elections to instrument for political competition in 2010. Second, we will use political fractionalization in 2005 as a proxy for political competition in 2010. Fortunately, the differences between non-IV, reduced-form and IV regressions are marginal, indicating that the problem of reverse causality is likely to be small.

Demobilized rebels' fractionalization, polarization and density. We construct 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

[19] In 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.

[20] Similar results are obtained with the Garcia-Montalvo and Reynal-Querol (2005b) original index.

2009[21]. 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)[22]. The second 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.

Other covariates We compute a median wealth index for each municipality from the household data from the 2010 Demographic and Health Survey (DHS)[23]. 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 civilians[24], which occurred throughout Burundi from 1997 to 2009 (Raleigh et al., 2010). Population size comes from the last available census, conducted in 2008 by the *Institut de Statistiques et d'Etudes Economiques du Burundi* (ISTEEBU).

4.2 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 of violent episodes. 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 link tests.

[21]The National Commission for Demobilization, Reinsertion and Reintegration kindly shared the data.

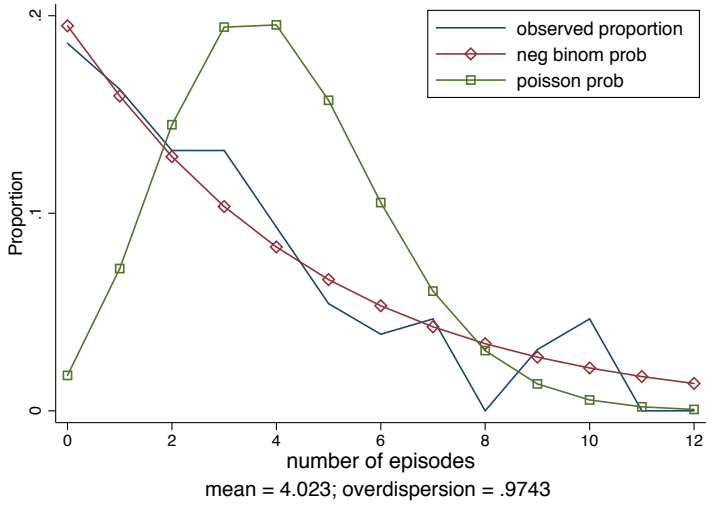
[22]It should be noted that most of the demobilized soldiers come from the former national army (FAB) and the current national forces of defense (FDN) (13,000 demobilized soldiers). Nevertheless, since FAB did not turn into a political party and its soldiers may be affiliated to different political group, we exclude these demobilized soldiers when we construct indexes of polarization and fractionalization. Controlling for the demobilization of FAB and FDN does not significantly affect the results (Table A.12).

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

[24]Battles are *"violent interaction between two politically organized armed groups at a particular time and location"*. We excluded non-violent events, riots and protests.

Figure 2 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 the Appendix, and give similar results.

Figure 2: 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, or "tight" fixed effects, should capture unobserved characteristics that are common among neighboring municipalities. This approach relies on the assumption that neighboring municipalities[25] are likely to be similar. This assumption is valid if unobservable characteristics are geographically distributed and if borders between municipalities are exogenous enough to ensure no important differences between unobservable characteristics of neighboring municipalities (Huillery, 2009).

We rely on three definitions of neighborhood to compute the fixed effects that are included in the model[26]. Let $m \in \{1, \ldots, M\}$ be a municipality. N_m, the set of neighbors of m and $n \in N_m$, one particular neighbor of m.

All pairs. We built a new dataset by matching each municipality m with each of its neighbors. Municipalities have between 2 and 10 neighbors (mean = 5.44 neighbors). This dataset contains 1404 observations, that is, 702 pairs of neighbors. Each pair is

[25]Neighboring is defined as sharing a common border.

[26]Our approach is close to Naidu (2012) and Goldstein and Udry (2008) who take the difference of the variables from the mean of the adjacent administrative units. In our case, the differentiation would lead to negative outcome values, which cannot be fitted by a negative binomial regression.

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 built a dataset listing all municipalities of the 129 neighborhoods, each neighborhood being then identified by a dummy variable. This new dataset contains 831 lines[27]. 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 neighbors, 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 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.

4.3 IV strategy

Estimates could potentially suffer from a reverse causality bias because the measures of political competition are based on the results of the municipal election in 2010. The occurrence of electoral violence before the municipal election may have affected voting behavior such as to affect indexes of polarization in a non-random way. We will use two strategies to prevent this source of bias.

First, we will use the results of the 2005 municipal elections to instrument for political competition in 2010. Since we estimate equation (1) with a negative binomial regression model, our IV strategy is a control function approach, in which we include the residuals from the first stage and their squared value in the second stage (Hilbe, 2011; Wooldridge, 2010). Figure 3 shows the predictive power of instruments for the 2010 indexes in bivariate

[27]There are 129 municipalities having on average 5.44 neighbors. $129 + (5.44 \times 129) = 831$. Data on wealth is missing for one municipality, which has 8 neighbors, implying that regressions with neighborhood fixed effects rely on 822 observations.

scatter plots. The F-rest associated with these bivariate correlations is 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. The exclusion restriction of the instrumental variable approach could be violated if (1) political fractionalization in 2005 is correlated to electoral violence in 2010 via a separate channel than political fractionalization in 2010 and (2) this channel is not captured by control variables and fixed effects[28]. This could have occurred if the CNDD-FDD, who ruled the country between 2005 and 2010, invested less in municipalities in which other parties obtained a high score in 2005. This lack of investment could have in turn triggered the violence in 2010. This is however unlikely: controlling for the share of municipal seats obtained by the CNDD-FDD in 2005 does not significantly change the estimates. The coefficient associated with political competition even increases, and the p-value associated with the electoral score of CNDD-FDD is equal to 0.82.

Second, we will also estimate the reduced-form of the IV regression (i.e. including political competition in 2005 only). This method is also subject to possible bias if *"the difference between the unmeasurable variable and the proxy variable is not a random variable independent of the true regressors"* (Frost, 1979). We expect the differences between political competition in 2010 and in 2005 to be non-random as the main differences between the 2010 and 2005 indicators are likely to be due to the apparition of new parties in the political arena. For example, the FNL benefited from demobilization and turned into a political party in 2009 (Table 1). The MSD was created in 2009 and has been quite popular in Bujumbura Mairie. These non-random differences may bias our estimates.

We recognize the limitations of each strategy, and therefore compare the results from the non-instrumented, reduced-form and instrumented political competition. Results are not significantly different in these alternative specifications, suggesting that this endogeneity issue is likely to be small.

5 Results

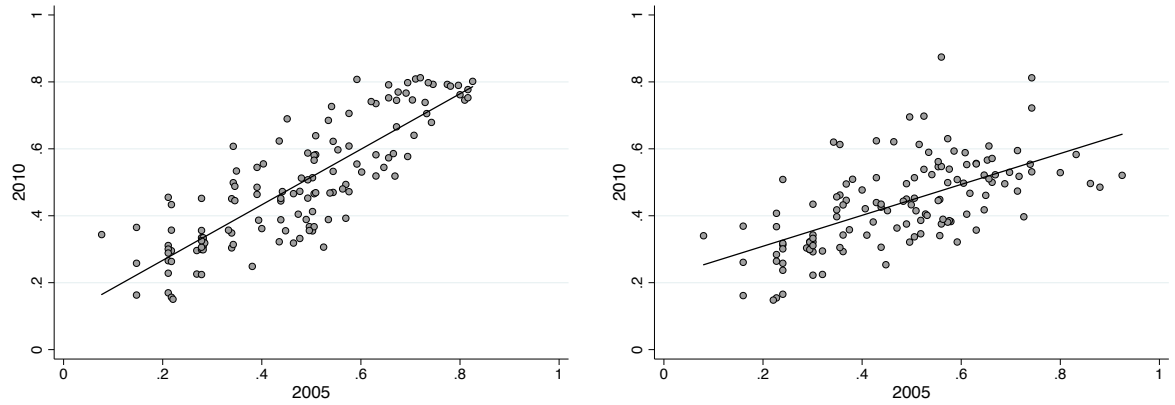
In Section 5.1, we examine if electoral violence is correlated with ethnic composition, political competition and the distribution of demobilized rebels. In Section 5.2, we look at how these factors interact together to favor the emergence of electoral violence.

5.1 Benchmark results

In Table 3, we explore one-by-one the three hypotheses that could have driven electoral violence. Neighborhood fixed effects are included in these specifications. In Table 4, the

[28]If such a channel exists, political competition would still be the cause of electoral violence, but in the long run: it is political competition in 2005 which would be the cause of electoral violence in 2010.

Figure 3: 2010 vs. 2005 Political Competition



(a) Fractionalization

(b) Polarization

three hypotheses are tested simultaneously and the different types of fixed effects are compared.

In columns (1) to (3) of Table 3, we assess if the ethnic composition of municipalities is correlated with the occurrence of electoral violence. From column (1), we see that the share of Hutu at the municipal level is positively correlated with electoral violence. The coefficient is large, but the relationship is not significant at conventional levels. As shown in Table 4, the coefficient becomes larger and significant when controlling for political competition. 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[29]. Ethnic diversity, measured by ethnic fractionalization, has no impact on electoral violence.

The relevance of political competition is examined in columns (4) to (9) in Table 3. As explained in Section 4.1, indexes of political competition are based on the results of the 2010 municipal elections. Reverse causality could potentially bias our estimates if electoral violence before the municipal elections 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. These instruments are strong: the Kleibergen-Paap F-statistic for weak identification is large in columns (5), (7) and (9), and is higher when we only consider polarization or fractionalization in 2005 indexes as instruments for their 2010 counterparts.

Political fractionalization and political polarization indexes seem to have a positive

[29]In places were the proportion of Hutu is low, the political landscape is more fragmented because both Hutu and Tutsi parties obtain a high share of votes (e.g. in Bujumbura Mairie or in the provinces of Cankuzo and Mwaro).

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. These differences can be explained by the multicollinearity between political polarization and fractionalization[30]: the correlation between these two variables is 0.65. In the IV regression (column (9)), 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 mechanism). In what follows, we will focus on the political fractionalization index. When all hypotheses are tested simultaneously, it is indeed political fractionalization which is positive and significant in reduced-form and IV regressions (Table A.3 in Appendix). Furthermore, the relation between political fractionalization in 2005 and in 2010 is stronger, pushing the F-test upwards, which makes political fractionalization in 2005 a better instrument. Note that the results are not significantly affected if political polarization is considered instead (as shown in Table A.2 in the Appendix). If we instrument both political polarization and fractionalization, the coefficients are not significantly different but are less precisely estimated (Table A.3 in the Appendix).

Columns (10) to (12) in Table 3 examine if the distribution of demobilized rebels had an impact on electoral violence in Burundi. The coefficients associated with the polarization index are 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 violence[31]. On the contrary, the coefficient associated with the rebels' fractionalization index is small and not significant. These results suggest that demobilized rebel groups have been more likely to be involved in electoral violence when competing with another group of similar size.

The three hypotheses are jointly tested in Table 4. In the first four columns, political fractionalization is not instrumented. Columns (5) to (8) report the reduced-form estimations. The results of the IV approach are presented in columns (9) to (12). Our benchmark model is estimated without fixed effects, with pair fixed effects, with neighborhood fixed effects and with random pairs fixed effects. It is reassuring to see that our findings are stronger when all variables of interest are included in the regression, thereby minimizing the risk of omitted variable bias. Table 4 also show that the results are not significantly affected when different types of fixed effects are included or when the IV or reduced-form estimates are considered.

[30]Interestingly, Alesina et al. (2003) faced the same problem with indexes of ethnic, linguistic and religious fractionalization and polarization.

[31]To interpret the results of the negative binomial regressions in percentage terms, one should take $\exp^{\beta} - 1$.

Table 3: Demobilized rebels, ethnic, political diversity, and electoral violence

Dependent variable: total episodes of electoral violence

	Ethnic grievances			Political competition in 2010						Competition demob. rebels		
				Negbin	IV	Negbin	IV	Negbin	IV			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Hutu share 2012	0.951		0.685									
	(0.823)		(1.243)									
Ethnic fractionalization 2012 (st.)		-0.103	-0.044									
		(0.102)	(0.154)									
Political fractionalization 2010 (st.)				0.260**	0.263**			-0.045	0.192			
				(0.114)	(0.133)			(0.135)	(0.227)			
Political polarization 2010 (st.)						0.306***	0.321**	0.326***	0.132			
						(0.096)	(0.136)	(0.117)	(0.240)			
Demob. rebels' polarization (st.)										0.258***		0.323***
										(0.086)		(0.114)
Demob. rebels' fractionalization (st.)											0.124	-0.110
											(0.083)	(0.115)
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
				First stages								
Political fractionalization 2005 (st.)					0.647***				0.565***			
					(0.038)				(0.055)			
Political polarization 2005 (st.)							0.609***		0.620***			
							(0.055)		(0.076)			
Controls					Yes		Yes		Yes			
Kleibergen-Paap F-test					238.791		100.479		17.559			

Controls include municipalities' number of Hutu demobilized soldiers per 1000 inhabitants, median wealth, log population, log population density and past violence. All estimations include neighborhood fixed effects (NFE). Standard errors are robust and clustered at two levels as described in Section 4.2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4: Benchmark Results

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)
Hutu share 2012	1.187	2.948**	2.629**	3.405**	1.301	2.769**	2.783**	3.235**	1.088	3.414***	2.840**	3.975***
	(0.944)	(1.331)	(1.260)	(1.490)	(0.928)	(1.197)	(1.179)	(1.416)	(0.896)	(1.248)	(1.241)	(1.494)
Ethnic fractionalization 2012 (st.)	-0.014	0.126	0.091	0.178	-0.012	0.139	0.133	0.187	-0.064	0.157	0.088	0.217
	(0.127)	(0.167)	(0.158)	(0.182)	(0.125)	(0.167)	(0.155)	(0.184)	(0.119)	(0.166)	(0.155)	(0.185)
Political fractionalization 2010 (st.)	0.038	0.369***	0.323***	0.365**					0.054	0.506***	0.375***	0.561***
	(0.105)	(0.126)	(0.114)	(0.145)					(0.118)	(0.144)	(0.144)	(0.186)
Political fractionalization 2005 (st.)					0.090	0.303***	0.284***	0.328***				
					(0.097)	(0.083)	(0.091)	(0.108)				
Demob. rebels' polarization (st.)	0.386***	0.337***	0.342***	0.343***	0.399***	0.393***	0.376***	0.398***	0.383***	0.342***	0.325***	0.352***
	(0.131)	(0.102)	(0.110)	(0.122)	(0.130)	(0.107)	(0.111)	(0.126)	(0.127)	(0.103)	(0.110)	(0.124)
Demob. rebels' fractionalization (st.)	-0.267**	-0.056	-0.125	-0.056	-0.304**	-0.156	-0.204*	-0.159	-0.275**	-0.065	-0.128	-0.074
	(0.134)	(0.105)	(0.115)	(0.130)	(0.140)	(0.114)	(0.121)	(0.141)	(0.130)	(0.105)	(0.114)	(0.133)
No. demob. rebels (/1000)	-0.056	0.020	0.020	0.039	-0.050	0.030	0.029	0.052	-0.051	0.041	0.028	0.067
	(0.066)	(0.062)	(0.062)	(0.059)	(0.066)	(0.063)	(0.063)	(0.061)	(0.067)	(0.062)	(0.061)	(0.062)
Past violence (log)	0.286***	0.144	0.127	0.152	0.286***	0.165*	0.140	0.175*	0.264***	0.126	0.118	0.127
	(0.096)	(0.104)	(0.109)	(0.100)	(0.092)	(0.099)	(0.107)	(0.095)	(0.095)	(0.102)	(0.106)	(0.100)
Median Wealth Index (st.)	0.084	-0.118	-0.026	-0.111	0.070	-0.119	-0.011	-0.128	0.076	-0.136	-0.013	-0.141
	(0.127)	(0.150)	(0.151)	(0.165)	(0.127)	(0.163)	(0.158)	(0.173)	(0.129)	(0.157)	(0.154)	(0.171)
Population (log)	0.759***	1.076***	1.161***	1.074***	0.795***	1.181***	1.252***	1.185***	0.726***	1.102***	1.131***	1.102***
	(0.233)	(0.223)	(0.234)	(0.246)	(0.235)	(0.227)	(0.240)	(0.251)	(0.236)	(0.218)	(0.227)	(0.249)
Population density (log)	0.284**	0.131	0.160	0.078	0.290***	0.161	0.201	0.108	0.266**	0.141	0.155	0.089
	(0.114)	(0.200)	(0.157)	(0.209)	(0.111)	(0.213)	(0.160)	(0.219)	(0.111)	(0.208)	(0.154)	(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
									First stages			
Political fractionalization 2005 (st.)									0.823***	0.609***	0.666***	0.604***
									(0.049)	(0.056)	(0.047)	(0.063)
Controls									Yes	Yes	Yes	Yes
Kleibergen-Paap F-test									282.258	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, log population, log population density and past violence. Standard errors are robust and clustered at the level relevant to the fixed effects included in the regression (as described in Section 4.2). * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

From Table 4, we conclude that ethnic grievances between Hutu and Tutsi did not cause 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 share of Hutu are positive and large 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. Based on column (11), a one-standard deviation increase in the proportion of Hutu raises the predicted number of events by 53%. Our model predicts an increase of about eight violent events between the municipalities characterized by the lowest and the highest proportion of Hutu.

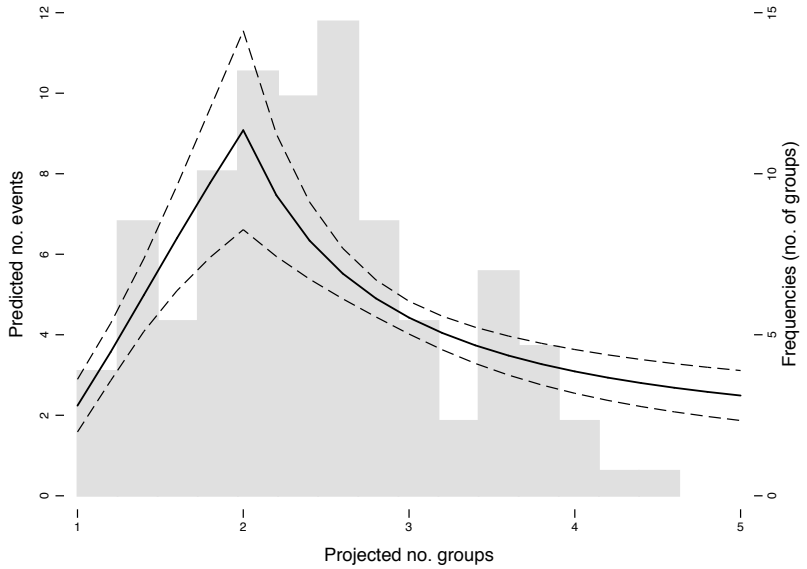
Political competition is also correlated with electoral violence. In Table 4, political competition is captured by the index of political fractionalization in 2010. The coefficients associated with political fractionalization are positive and significant at the 1% level when tight fixed effects are included in the regression. This is the case when political fractionalization in 2010 is not instrumented as well as in the reduced-form and the IV regressions. An one standard-deviation increase in political fractionalization leads to between 33% to 66% more events, depending on the specification.

The coefficients associated with demobilized rebels' polarization are positive and strongly significant in all specifications. The size of the effect is similar to the effect of political fractionalization. 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)). Figure 4 illustrates this finding. It shows the predicted number of events when demobilized rebels' polarization and fractionalization are considered simultaneously, as a function of the projected number of groups of equal size in each municipality[32]. The predicted number of episodes is maximal when there are two groups of former rebels of similar size. Importantly, the number of demobilized rebels that returned to the municipality does not seem to be associated with electoral violence. We conclude that the number of "hardcore supporters" does not directly explain the occurrence of electoral violence. Rather, electoral violence is more likely to occur in municipality characterized by a bipolar distribution of demobilized rebel groups.

Table 4 also provides some evidence that past violence could be positively correlated with electoral violence in 2010. Altough not significant in all regressions, this relationship

[32]Assuming 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, frac$= 1 - \frac{1}{n}$ where n is the number of groups. The x-axis reports n for each municipality such that $n = \frac{1}{(1-\text{frac})}$.

Figure 4: Predicted number of events in function of projected number of groups of the same size



Note: this figure is based on the neighborhood fixed effect estimation (Table 4, Column (11))

is in line with the reports from International Crisis Group (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."* These rumors where confirmed by households which reported looting, clashes between groups and attacks against the military (International Crisis Group, 2012, 2011).

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

5.2 Heterogenous effects

In this section, we allow for interactions between the variables of interest. The results are shown in Table 5. Marginal and total predicted effects are represented graphically in Appendix (Figures A.1 to A.4).

Demobilized rebels' polarization and proportion of Hutu. In line with the conceptual framework, it seems intuitively plausible that polarization between demobilized rebel groups is a better predictor of electoral violence in pro-Hutu municipalities. The

expected return from violence should indeed be higher in pro-Hutu municipalities as the Hutu are the majority and hence more likely to rule the country after the elections. We test this hypothesis by interacting demobilized rebels' polarization with the proportion of Hutu. We expect the marginal impact of the demobilized rebels' polarization index to be close to zero in Tutsi municipalities, and then to be increasing in the proportion of Hutu. Similarly, the marginal impact of the proportion of Hutu should be close to zero in municipalities that are not polarized, and then be increasing in the demobilized rebels' polarization index. Results from column (1) of Table 5 confirm this intuition. The interaction term is positive and close to be significant (p-value: 0.11), implying that demobilized rebels' polarization and the proportion of Hutu are complementary explanations of electoral violence.

Proportion of Hutu and political fractionalization. A similar reasoning applies to the interaction between political fractionalization and the proportion of Hutu. The Hutu are the majority and have the most to gain or loose from electoral competition. It is therefore likely that the correlation between political competition and electoral violence will be higher in pro-Hutu municipalities and lower in pro-Tutsi municipalities. Results in column (2) confirm this intuition. Electoral violence is particularly high in Hutu strongholds where political competition is high, confirming the intra-Hutu dimension of post-war electoral competition.

Demobilized rebels' polarization and political fractionalization. In column (3) we investigate to what extent the interaction between demobilized rebels' polarization and political fractionalization determines electoral violence. We have no prior about the sign of the interaction term. It could be positive if both factors are jointly required to generate electoral violence, or negative if only one of these factors is sufficient to cause violence. Results from column (3) show that the coefficient associated with the interaction term is negative and weakly significant. As shown on Figure A.3 in Appendix, the total predicted effect of these two variables is similar if only demobilized rebel's polarization is high, if only political fractionalization is high or if both variables are high. Only one of these conditions is needed to increase the prevalence of electoral violence.

Number of demobilized rebels and political fractionalization. The literature suggests that the presence of "specialists in violence" or "hardcore supporters", such as demobilized rebels, is likely to increase the return from violent campaigning (Collier and Vicente, 2012; Chaturvedi, 2005). We therefore test whether the number of demobilized rebels and political competition are complementary explanations for electoral violence. In column (4) of Table 5, the coefficient associated with this interaction is positive and significant. The presence of demobilized rebels increases the likelihood of violence in

places where political competition is intense.

Table 5: Interacting the no. of demobilized and political competition

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	2.010	1.490	2.698**	3.197***
	(1.295)	(1.330)	(1.192)	(1.199)
Ethnic fractionalization 2012 (st.)	0.046	-0.093	0.110	0.121
	(0.157)	(0.175)	(0.153)	(0.146)
Political fractionalization 2010 (st.)	0.341**	-1.956**	0.316**	0.243
	(0.140)	(0.825)	(0.143)	(0.152)
Demob. rebels' polarization (st.)	-0.654	0.323***	0.366***	0.333***
	(0.614)	(0.107)	(0.109)	(0.108)
Demob. rebels' fractionalization (st.)	-0.169	-0.121	-0.119	-0.140
	(0.120)	(0.109)	(0.114)	(0.115)
No. demob. rebels (/1000)	0.019	0.017	0.017	0.062
	(0.058)	(0.056)	(0.060)	(0.057)
Past violence (log)	0.123	0.122	0.136	0.122
	(0.102)	(0.106)	(0.104)	(0.098)
Median Wealth Index (st.)	-0.025	0.078	0.006	-0.020
	(0.150)	(0.151)	(0.154)	(0.127)
Population (log)	1.156***	1.073***	1.192***	1.080***
	(0.230)	(0.233)	(0.231)	(0.218)
Population density (log)	0.089	0.178	0.136	0.142
	(0.164)	(0.149)	(0.156)	(0.136)
Demob. rebels' polarization × Hutu share	1.214			
	(0.765)			
Political frac. × Hutu share		2.785***		
		(0.986)		
Demob. rebels' polarization × Political frac.			-0.171***	
			(0.066)	
Demob. rebels (/1000) × Political frac.				0.094**
				(0.039)
Observations	822	822	822	822
Fixed Effects	NFE	NFE	NFE	NFE

All estimations include neighborhood fixed effects (NFE). Standard errors are robust and clustered at two levels as described in Section 4.2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6 Discussion

In this section, we further discuss the results presented in the previous section, putting them in perspective with the mechanisms identified in the conceptual framework. We then discuss whether electoral violence in 2010 is different from other types of violence. Finally, we show that our results are robust to alternative specifications and likely to be causal.

6.1 Reconciling theoretical and empirical evidence

Our findings show that electoral violence has not been driven by ethnic tensions between the Hutu majority and the Tutsi minority. While the economic literature point at ethnic

grievances to explain violence, our results suggest that this explanation is not relevant for explicating the electoral violence that occurred during the 2010 electoral process in Burundi. Violence rather emerged as a result of tensions between political parties and between demobilized rebel groups in pro-Hutu areas. As explained in the conceptual framework, the stakes of the election were expected to be higher for Hutu parties and groups thereby generating higher incentives to engage in violent campaigning. Importantly, these results are backed by the recent literature on political landscape in Burundi which confirms the evolution from inter-ethnic conflict to an intra-Hutu competition for power[33]. In her report on the 2010 elections, Palmans (2012) writes *"unlike in 1993, electoral competition today is no longer dominated by ethnic rivalry."* Similarly, Vandeginste (2014) reports that *"there is general agreement among observers that, as a result, the 2010 Burundian elections were no longer a matter of primarily ethnic competition - which is quite an achievement in a country torn apart by politico-ethnic strife for decades."*

We also find that high political competition between parties increased the likelihood of electoral violence. In line with Sterck (2015), violence emerged where the election was tight such that a few votes could have changed the outcome. Contrarily to the theoretical predictions of Collier and Vicente (2012) and Chaturvedi (2005), illicit campaigning does not seem to be a strategy of weak parties against the strong ones. The effect of political competition is stronger in Hutu-dominated municipalities, showing that ethnic power-sharing, which has been institutionalized in Burundi through the Arusha peace agreement and the 2005 Constitution, *"contributed to reducing the ethnic divide in Burundian society which today is shaken by tensions based on what are essentially political cleavages within the Hutu majority"* (International Crisis Group, 2011).

Finally, we find that "hardcore supporters", or "specialists in violence" played a role in sparking violence, as suggested by Collier and Vicente (2012) and Chaturvedi (2005). Our empirical analysis identifies two mechanisms. First, electoral violence is more likely to emerge in the presence of two main groups of demobilized rebels of similar size. Second, the presence of numerous demobilized rebels seems to amplify the impact of political competition on violence. The instability due to the presence of demobilized rebels and their association with parties has been reported by observers and NGOs on the ground. Human Rights Watch (2010) reports that *"The presence of partisan youth groups adds to political volatility. A number of parties have made significant efforts to recruit demobilized combatants, raising concerns that such youth could easily be manipulated into carrying out acts of violence"*. In addition, many demobilized combatants were the victims of violence (Human Rights Watch, 2012; Amatora Mu Mahoro, 2010).

In line with the work of Horowitz (1985), we find that tensions between demobilized rebel groups are better captured by an indicator of polarization between demobilized groups than by an indicator of fractionalization. This is also in accordance with Esteban

[33]See e.g. Palmans (2012), Vandeginste (2011, 2014) or International Crisis Group (2011).

et al. (2012b) who conclude that polarization is more important *"when the winners enjoy a public prize (such as political power or religious hegemony)"*. Our study is not as conclusive about the relative performance of political fractionalization and polarization indexes. This is due to the high degree of multicollinearity between these two indicators in the context of Burundi. Interestingly, Alesina et al. (2003) encountered the same problem when studying the effects of ethnic, linguistic and religious heterogeneity on the quality of institutions and growth.

6.2 Is electoral violence different from other types of violence?

To answer this question, we undertake a falsification exercise in which we replace the dependent variable, electoral violence, by other variables which are related in nature but which are not expected to be affected by the same regressors of interest. Results of falsification tests are presented in Table 6. This exercise does not aim to uncover causal relationships, but rather to provide suggestive evidence that electoral violence is different from other types of violence.

In columns (1) and (2), the dependent variables are respectively the attacks against civilians and battles[34] which occurred between 1997 and 2006, as recorded in ACLED data. In column (3), we used data from the 2010 DHS survey[35] to compute the proportion of individuals who think that domestic violence 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. The last two falsifications tests use proxies of crime prevalence constructed relying on the 2012 Afrobarometer survey. The first indicator measures how often households have feared crime in their own house[36]. The second indicator is the proportion of people that have reported "crime and security" as one of the three most important problems in Burundi[37].

Electoral violence does not seems to be similar to other types of violence. Demobilized rebels' polarization is never significantly correlated with the five dependent variables. Contrary to our benchmark results, ethnic fractionalization is strongly correlated with attacks against civilians, in line with the literature on ethnic grievances and civil war (Blattman and Miguel, 2010). Looking at yearly data, we see that this is true for most years before the ceasefire between the CNDD-FDD and the transitional government in

[34]Battles are defined as *"a violent interaction between two politically organized armed groups at a particular time and location"* (Raleigh et al., 2010).

[35]Results are available for 128 out of 129 municipalities.

[36]Possible responses are never, just once or twice, few times, many times or always. The construction of 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).

[37]Only 111 municipalities were surveyed in the Afrobarometer.

2003 (Table A.17 in Appendix). The relationship between political fractionalization and other types of violence is ambiguous. The coefficient associated with political fractionalization is positive and significant for battles and perception of criminality, and negative and significant for domestic violence. Overall, these regressions suggest that the causes of electoral violence are different, particularly regarding the role played by demobilized groups and the absence of relationship with ethnic fragmentation.

Table 6: Falsification tests

	Attacks civilians (1)	Battles (2)	Domestic violence (3)	Fearing crime (4)	Crime issue (5)
Hutu share 2012	2.577	0.217	-0.468*	-0.366	-0.352
	(1.594)	(1.193)	(0.276)	(1.110)	(1.001)
Ethnic fractionalization 2012 (st.)	0.441***	0.064	-0.038	-0.149	-0.234**
	(0.131)	(0.134)	(0.033)	(0.126)	(0.111)
Political fractionalization 2010 (st.)	0.149	0.358**	-0.058**	-0.197	0.268**
	(0.206)	(0.150)	(0.029)	(0.142)	(0.122)
Demob. rebels' polarization (st.)	0.136	-0.113	-0.007	-0.022	0.075
	(0.137)	(0.103)	(0.024)	(0.115)	(0.076)
Demob. rebels' fractionalization (st.)	-0.121	-0.041	-0.001	-0.062	-0.014
	(0.138)	(0.107)	(0.024)	(0.086)	(0.089)
No. demob. rebels (/1000)	0.113**	0.059	0.003	0.035	0.003
	(0.048)	(0.048)	(0.010)	(0.035)	(0.025)
Past violence (log)			0.047***	0.014	-0.023
			(0.017)	(0.077)	(0.056)
Median Wealth Index (st.)	-0.073	-0.056	-0.221***	-0.316*	0.006
	(0.136)	(0.132)	(0.031)	(0.181)	(0.075)
Population (log)	1.618***	1.677***	-0.060	-0.513***	0.093
	(0.199)	(0.202)	(0.049)	(0.187)	(0.185)
Population density (log)	0.104	0.158	-0.015	-0.070	-0.171*
	(0.157)	(0.123)	(0.038)	(0.152)	(0.097)
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 columnns (3) to (5). Attacks against civilians and battles aggregates all ACLED records by type between 1997 and 2009.

6.3 Are the relationships causal?

Is the effect of demobilized rebels polarization causal? Given the impossibility to randomly assign resettlement locations to demobilized 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 demobilized rebels' polarization and electoral violence.

Two types of unobservable characteristics could induce a spurious correlation between demobilized 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 demobilized rebel groups (e.g. reasons for joining the rebellion) such as to affect demobilized rebel polarization in a non-random way, the coefficient associated with demobilized 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 demobilized rebel groups in the model. By doing so, we indirectly control for all unobserved factors affecting the composition of demobilized rebel groups that could potentially impact electoral violence via another route. In column (1) of Table 7, the proportions of demobilized rebels belonging to each faction are included in the regressions[38]. In column (2), the proportions of the population belonging to each faction are included in the regressions. Including these proportions as control variables does not change our results. The relationship between the polarization index of demobilized rebel groups and the occurrence of electoral violence remains positive and significant, and point estimates even increase.

Table 7: Causality

Dependent variable: total episodes of electoral violence

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

All estimations include neighborhood fixed effects (NFE). Standard errors are robust and clustered at two levels as described in Section 4.2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Second, some unobserved factors B may have influenced the location where demobilized combatants resettled after the conflict. If these factors also had a direct impact on the occurrence of electoral violence, the coefficient associated with demobilized 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 demobilized rebels, 83%, returned to their municipality of origin; 86% of them returned to their province of origin. These statistics suggest that most demobilized combatants returned

[38]Regressions with the different types of fixed effects are reported in the Appendix, Tables A.4 to A.7.

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 return home went to Bujumbura Mairie[39]. In fact, 70% of those who returned to Bujumbura Mairie are originally from another municipality. In column (3) of Table 7, we test if estimates are affected when the capital city is removed from the sample. The coefficient associated with demobilized rebels' polarization increases compared to the benchmark regressions, but is not statistically different. The coefficient associated with political fractionalization is lower and not significant at conventional thresholds. Removing Bujumbura Mairie reduces the variability of political fractionalization as the stronghold of political competition is located in the capital: political fractionalization is on average 1.5 standard deviation higher in Bujumbura Mairie than in the rest of the country. Finally, we tested if the results change when information on the origin of demobilized 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 demobilized rebels' polarization. We therefore conclude that the correlation between demobilized 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 coefficients associated with political competition are similar with and without resorting to the instrumental variable approach, indicating that political competition is in fact 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 are affected such as to alter political competition in a non-random way, our regressions could partly capture these unobserved factors C. In order to test this hypothesis, we included the proportion of voters for each party in the regression (Table A.5 in the Appendix). This increases the point estimates of the political competition index[40].

Two types of biases could affect our result related to ethnic composition. First, variables related to ethnicity may fail to capture some important variations between municipalities because they are computed at the province level. Since the Afrobarometer is representative at that level, ethnic shares calculated at the municipal level are likely

[39]The capital is very different from rural municipalities. 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 demobilized combatants than rural municipalities ($p = 0.079$).

[40]By controlling for the proportion of voters, we include components of the political fractionalization index. This can cause multicollinearity, which explains the increase in standard errors and related loss of significance.

to be mismeasured and, if used as such, associated coefficients would suffer from an attenuation bias (Hausman, 2001). Second, estimates could suffer from reverse causality bias if the ethnic composition of municipalities has been affected by electoral violence, which is unlikely. We test these two potential sources of biases by instrumenting ethnic composition at the municipal level with data from the 1993 presidential elections. Two main candidates, one Hutu and one Tutsi, competed during the presidential elections in 1993[41]. Our instrument uses the fact that the Tutsi were more likely to vote for the Tutsi candidate, and the Hutu more likely to vote for the Hutu candidate. If the exogeneity condition is satisfied[42], the instrumentation should extract the useful information from our two imperfect measures of ethnicity to solve both reverse causality and mismeasurement problems. As shown in Table A.8 in the Appendix, our results are not significantly affected when we use this IV strategy. This suggests that the impact of the proportion of Hutu on electoral violence is likely to be causal.

6.4 Are the results robust?

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, with standard-errors adjusted for spatial correlation (Conley, 1999) and controlling for spatial dependence. Our results are robust to these alternative estimation strategies. 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 discussed below, and corresponding tables are shown in the 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 over-dispersion. We nevertheless estimated OLS (Table A.9 in the Appendix) and Poisson (Table A.10 in the 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.

Alternative set of controls. Results are not significantly affected when additional control variables are included in the regressions. In particular, results hold when we control for latitude and longitude and their powers, for electoral results, for the number

[41] 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. A third candidate, the Hutu Pierre-Claver Sendegeya, only got 1.35% of votes.

[42] We believe that the proportion of pro-Hutu votes in 1993 is correlated with electoral violence only through the ethnic composition in 2012 conditional on others control and tight fixed effects implying that the exogeneity condition of the instrument is satisfied (Hilbe, 2011).

of demobilized rebels from each group in the population, for the presence of demobilized soldiers from the national army (FAB and FDN) or for municipalities in the capital city. Similarly, results do not change much when past violence or wealth are removed from the list of controls (Table A.11 in the Appendix). These two variables could potentially be outcomes of variables of interest and hence considered as "bad controls" (Angrist and Pischke, 2008). The question of bad controls is complex because no test is available to determine which variables are bad controls. There is a trade-off between the risk of omitted variable bias if important variables are omitted and selection bias if bad controls are included in the regression. The coefficients of interest are not significantly affected by the removal of past violence or wealth. This suggests that the problem of "bad controls" is not much of a threat in our study.

Selection on observables and unobservables. Our regressions control for numerous observed and unobserved heterogeneity thanks to control variables and geographic fixed effects. Despite these precautions, we cannot completely rule out that some unobservable characteristics could bias the results in one way or another.

Altonji et al. (2005) proposed a method to estimate the relative influence of unobservables by analyzing how coefficients of interest are affected by the inclusion of control variables. The method requires estimating a regression with a restricted set of control variables and one with the full set of controls. Denoting $\hat{\beta}_R$ the coefficient of interest measured in the former regression, and $\hat{\beta}_F$ the coefficient measured in the latter regression, the ratio $\hat{\beta}_F/(\hat{\beta}_R - \hat{\beta}_F)$ quantifies how strong the selection on unobservables should be relative to the selection on observables to explain away the estimated effect of the variable of interest (Bellows and Miguel, 2009; Nunn and Wantchekon, 2011). In our case, coefficients of interest measured in the regressions with control variables and fixed effects are higher than the coefficients measured in regressions with a restricted set of controls (Table A.13 in Appendix), leading to a negative ratio $\hat{\beta}_F/(\hat{\beta}_R - \hat{\beta}_F)$. Intuitively, controlling for more unobservables should result in higher coefficients of interest. Our estimates are therefore likely to be lower bounds.

Removing outliers. We tested how results are affected by the removal of outliers from the sample (Table A.14 in the 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 A.15). 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 Moran's statistic associated with the indicator of electoral violence is negative and not significant (p-value=0.330). In other words, the occurrence of violence in one municipality does 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 four 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 Plümper, 2010). Third, we estimated the models developed by Pisati (2010) for linear regression models. We used two different weighting matrices: one identifying neighboring municipalities and one based on latitude and longitude data. Fourth, we estimated the OLS model and adjusted standard-errors for spatial correlation Conley (1999). These different estimation strategies and the two different weighting matrices yield 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 demobilized rebel groups on electoral violence.

Placebo test. Finally, we carried out placebo tests to check if our results could be driven by the nature of our explanatory variables (Table A.16 in the 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 they should not. We test this with two different polarization indexes, based on age-groups[43] and on religion respectively[44]. The former stems from the hypothesis that youth bulges may be a source of conflict (Urdal, 2006). Nonethe-

[43]In 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 the 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.

[44]The religious polarization index also relies on DHS data, which classifies men and women into seven 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.

less, it is the bulge itself, not the age-group polarization that could eventually matter[45]. 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 enter significantly in the regressions.

7 Concluding remarks

In the last four decades, 80% of elections in Sub-Saharan Africa suffered from violence, bribery, intimidation or inequitable government interference (Bishop and Hoeffler, 2014). Using a unique dataset on electoral violence in Burundi, we test if electoral violence is driven by (1) ethnic composition and ethnic grievances, (2) political competition or (3) the presence and distribution of demobilized combatants. Understanding the causes of electoral misconduct in Burundi is of crucial importance for the stability of the Great Lake region. At the time of writing, violence erupted again at the eve of the 2015 round of elections, leading to dozens of deaths and thousands of refugees who fled to neighboring Rwanda, Tanzania and Democratic Republic of the Congo.

Our analysis shows that electoral violence was more prevalent in municipalities with two equally large groups of demobilized rebels (a one standard deviation increase in polarization among rebel groups leads to an increase of 38% of violent events) and characterized by a fierce political competition (an increase of one standard deviation in political fractionalization leads to 45% more violent events). The later effect is stronger in municipalities with numerous former rebels. Politicians willing to seize power through illicit means seems to have exploited their former allegiances with demobilized rebels to commit violence. Interestingly, cleavages between ethnic groups, which were the main causes of violence in post-independence Burundi, did not fuel electoral violence in 2010. Violent campaigning was rifer in municipalities populated by a high proportion of Hutu. Unlike in 1993, political competition in Burundi no longer coincides with ethnic cleavages. Instead, the 2010 Burundian elections were disrupted by tensions based on political cleavages between Hutu parties and between former rebel groups.

The findings of this study suggest several important avenues for future research. First, more theoretical work is needed to understand the determinant of electoral violence. In particular, the models of Collier and Vicente (2012) and Chaturvedi (2005) should be extended to conform with our empirical findings: rather than being a desirable strategy of the weakest parties, electoral violence in Burundi emerged in places where political competition was tight. Second, empirical research should be conducted to test the external

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

validity of our findings and to distinguish different types of electoral malpractices. Future analysis should also determine when intimidation and violence are used as electoral tools, and when they are the mere consequence of frustrations that flare up when tensions run high during the elections. Third, the consequences of electoral violence on populations and on the provision of public goods should be further studied. Finally, more research is necessary to understand how prevention campaigns could successfully reduce the risk of electoral violence. In order to maximize their cost-effectiveness, these programs should be carefully designed by taking into account empirical evidence on the causes of electoral violence. Following our study, programs specifically targeted at demobilized combatants should be further evaluated.

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APPENDIX

Table A.1: Correlation matrix between variables of interest

	Demob. rebels' polarization (st.)	Demob. rebels' fractionalization (st.)	Hutu share	Ethnic fractionalization 2012 (st.)	Political polarization 2010 (st.)	Political fractionalization 2010 (st.)
Demob. rebels' polarization (st.)	1					
Demob. rebels' fractionalization (st.)	0.6746	1				
Hutu share	-0.2041	-0.0306	1			
Ethnic fractionalization 2012 (st.)	-0.0342	-0.2099	-0.6617	1		
Political polarization 2010 (st.)	0.0829	0.032	-0.2172	0.2631	1	
Political fractionalization 2010 (st.)	-0.0085	0.01	-0.418	0.261	0.6458	1

Table A.2: Benchmark with political polarization only

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)
Hutu share 2012	1.120	1.956	1.737	2.388	1.133	2.090	2.070	2.440*	1.262	1.968	1.652	2.374*
	(0.962)	(1.279)	(1.197)	(1.497)	(0.949)	(1.331)	(1.280)	(1.441)	(1.054)	(1.282)	(1.203)	(1.409)
Ethnic fractionalization 2012 (st.)	-0.032	0.023	-0.016	0.071	-0.012	0.081	0.066	0.114	0.012	0.019	-0.031	0.066
	(0.130)	(0.148)	(0.145)	(0.173)	(0.127)	(0.166)	(0.158)	(0.179)	(0.152)	(0.146)	(0.147)	(0.167)
Political fractionalization 2010 (st.)	0.092	0.291***	0.296***	0.265***					-0.022	0.316**	0.313**	0.283*
	(0.103)	(0.095)	(0.093)	(0.100)					(0.155)	(0.150)	(0.147)	(0.161)
Political polarization 2005 (st.)					-0.004	0.204**	0.202**	0.183*				
					(0.097)	(0.088)	(0.093)	(0.094)				
Demob. rebels' polarization (st.)	0.368***	0.304***	0.290**	0.316**	0.380***	0.362***	0.342***	0.359***	0.368***	0.301***	0.253**	0.314**
	(0.135)	(0.110)	(0.116)	(0.128)	(0.130)	(0.107)	(0.112)	(0.123)	(0.133)	(0.107)	(0.112)	(0.125)
Demob. rebels' fractionalization (st.)	-0.271**	-0.053	-0.110	-0.052	-0.254*	-0.116	-0.163	-0.103	-0.239*	-0.056	-0.076	-0.054
	(0.129)	(0.110)	(0.116)	(0.135)	(0.138)	(0.117)	(0.123)	(0.137)	(0.144)	(0.112)	(0.120)	(0.133)
No. demob. rebels (/1000)	-0.054	-0.005	0.001	0.008	-0.059	-0.015	-0.011	-0.001	-0.056	-0.003	-0.005	0.008
	(0.064)	(0.052)	(0.053)	(0.052)	(0.064)	(0.053)	(0.055)	(0.053)	(0.067)	(0.052)	(0.055)	(0.053)
Past violence (log)	0.260**	0.112	0.087	0.133	0.294***	0.155	0.131	0.171*	0.296***	0.108	0.090	0.130
	(0.102)	(0.104)	(0.104)	(0.104)	(0.091)	(0.105)	(0.109)	(0.102)	(0.108)	(0.110)	(0.107)	(0.106)
Median Wealth Index (st.)	0.100	-0.021	0.064	-0.018	0.095	-0.047	0.054	-0.042	0.111	-0.021	0.062	-0.018
	(0.120)	(0.124)	(0.133)	(0.163)	(0.119)	(0.145)	(0.149)	(0.168)	(0.124)	(0.124)	(0.138)	(0.157)
Population (log)	0.795***	1.169***	1.251***	1.146***	0.738***	1.166***	1.226***	1.137***	0.730***	1.176***	1.233***	1.148***
	(0.236)	(0.218)	(0.223)	(0.255)	(0.229)	(0.231)	(0.237)	(0.254)	(0.252)	(0.222)	(0.226)	(0.253)
Population density (log)	0.266**	0.088	0.102	0.046	0.286**	0.138	0.170	0.080	0.272**	0.087	0.098	0.043
	(0.118)	(0.178)	(0.146)	(0.200)	(0.113)	(0.203)	(0.156)	(0.215)	(0.111)	(0.177)	(0.147)	(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

	First stages			
Political polarization 2005 (st.)	0.624***	0.590***	0.618***	0.593***
	(0.061)	(0.073)	(0.065)	(0.086)
Controls	Yes	Yes	Yes	Yes
Kleibergen-Paap F-test	104.718	74.73	89.226	39.492

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

Table A.3: 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)
Hutu share 2012	1.061	2.257*	1.886	2.793*	1.416	2.723**	2.689**	3.204**	1.626	3.448***	2.721**	4.480***
	(0.951)	(1.262)	(1.175)	(1.462)	(0.945)	(1.172)	(1.165)	(1.417)	(1.046)	(1.218)	(1.208)	(1.656)
Ethnic fractionalization 2012 (st.)	-0.035	0.047	-0.004	0.110	-0.005	0.136	0.122	0.182	0.005	0.171	0.075	0.288
	(0.130)	(0.146)	(0.142)	(0.172)	(0.125)	(0.162)	(0.151)	(0.184)	(0.142)	(0.149)	(0.151)	(0.198)
Political fractionalization 2010 (st.)	-0.039	0.091	0.048	0.127					0.172	0.487*	0.323	0.757**
	(0.120)	(0.120)	(0.126)	(0.175)					(0.188)	(0.263)	(0.251)	(0.366)
Political polarization 2010 (st.)	0.113	0.252**	0.275**	0.209*					-0.226	-0.003	0.052	-0.199
	(0.119)	(0.107)	(0.112)	(0.121)					(0.243)	(0.278)	(0.262)	(0.313)
Political fractionalization 2005 (st.)					0.198	0.237*	0.210	0.322*				
					(0.158)	(0.137)	(0.146)	(0.165)				
Political polarization 2005 (st.)					-0.128	0.076	0.085	0.010				
					(0.152)	(0.140)	(0.145)	(0.144)				
Demob. rebels' polarization (st.)	0.359***	0.305***	0.293**	0.323**	0.416***	0.388***	0.367***	0.402***	0.428***	0.351***	0.295***	0.395***
	(0.139)	(0.107)	(0.115)	(0.126)	(0.127)	(0.104)	(0.109)	(0.125)	(0.131)	(0.111)	(0.113)	(0.137)
Demob. rebels' fractionalization (st.)	-0.263*	-0.054	-0.112	-0.057	-0.298**	-0.157	-0.202*	-0.162	-0.280**	-0.061	-0.097	-0.080
	(0.134)	(0.108)	(0.117)	(0.131)	(0.141)	(0.114)	(0.122)	(0.140)	(0.137)	(0.111)	(0.120)	(0.139)
No. demob. rebels (/1000)	-0.055	0.003	0.005	0.020	-0.036	0.022	0.020	0.048	-0.035	0.038	0.024	0.073
	(0.065)	(0.053)	(0.055)	(0.054)	(0.072)	(0.058)	(0.060)	(0.061)	(0.072)	(0.057)	(0.057)	(0.064)
Past violence (log)	0.260**	0.113	0.088	0.132	0.291***	0.159	0.134	0.175*	0.278***	0.118	0.103	0.134
	(0.103)	(0.104)	(0.104)	(0.101)	(0.091)	(0.103)	(0.108)	(0.099)	(0.107)	(0.110)	(0.106)	(0.104)
Median Wealth Index (st.)	0.113	-0.039	0.054	-0.042	0.030	-0.099	0.012	-0.127	0.080	-0.101	0.016	-0.153
	(0.128)	(0.132)	(0.140)	(0.162)	(0.130)	(0.156)	(0.159)	(0.179)	(0.131)	(0.140)	(0.149)	(0.177)
Population (log)	0.787***	1.157***	1.246***	1.139***	0.814***	1.193***	1.260***	1.192***	0.727***	1.137***	1.191***	1.102***
	(0.236)	(0.218)	(0.224)	(0.245)	(0.236)	(0.227)	(0.237)	(0.254)	(0.232)	(0.224)	(0.219)	(0.260)
Population density (log)	0.264**	0.096	0.106	0.056	0.287**	0.161	0.196	0.107	0.248**	0.144	0.140	0.112
	(0.117)	(0.180)	(0.147)	(0.201)	(0.112)	(0.209)	(0.156)	(0.222)	(0.097)	(0.181)	(0.141)	(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
									First stages			
Political fractionalization 2005 (st.)									0.863***	0.528***	0.592***	0.514***
									(0.065)	(0.049)	(0.059)	(0.055)
Political polarization 2005 (st.)									0.557***	0.567***	0.591***	0.558***
									(0.071)	(0.056)	(0.076)	(0.070)
Controls									Yes	Yes	Yes	Yes
Kleibergen-Paap F-test									32.808	11.355	14.604	14.604

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

Table A.4: Controlling for the proportion of ex-combatants from each faction

	Dependent variable: total episodes of electoral violence							
	Relative proportion of demob.				Proportion of population being demob.			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hutu share 2012	1.186	3.460***	2.730**	3.829**	1.933*	4.676***	3.669***	5.049***
	(1.033)	(1.250)	(1.168)	(1.653)	(1.043)	(1.260)	(1.205)	(1.506)
Ethnic fractionalization 2012 (st.)	-0.144	0.076	0.011	0.122	-0.080	0.172	0.081	0.208
	(0.139)	(0.164)	(0.146)	(0.195)	(0.143)	(0.157)	(0.143)	(0.177)
Political fractionalization 2010 (st.)	0.127	0.486***	0.384**	0.549***	0.173	0.607***	0.441***	0.688***
	(0.144)	(0.151)	(0.156)	(0.209)	(0.136)	(0.166)	(0.159)	(0.207)
Demob. rebels' polarization (st.)	0.371**	0.505***	0.402***	0.508***	0.379**	0.475***	0.402***	0.510***
	(0.168)	(0.141)	(0.137)	(0.176)	(0.156)	(0.133)	(0.132)	(0.155)
Demob. rebels' fractionalization (st.)	-0.257	-0.267	-0.229	-0.266	-0.320**	-0.238*	-0.267*	-0.272*
	(0.219)	(0.193)	(0.190)	(0.222)	(0.152)	(0.135)	(0.137)	(0.162)
No. demob. rebels (/1000)	-0.042	0.055	0.045	0.091	0.031	0.191	0.096	0.192
	(0.075)	(0.070)	(0.064)	(0.072)	(0.121)	(0.124)	(0.120)	(0.124)
Past violence (log)	0.247**	0.107	0.096	0.126	0.205*	0.070	0.071	0.083
	(0.106)	(0.109)	(0.108)	(0.110)	(0.107)	(0.103)	(0.103)	(0.107)
Median Wealth Index (st.)	0.101	-0.054	0.063	-0.061	0.132	-0.129	0.030	-0.122
	(0.131)	(0.157)	(0.147)	(0.179)	(0.124)	(0.122)	(0.131)	(0.156)
Population (log)	0.866***	1.200***	1.239***	1.214***	0.899***	1.263***	1.252***	1.334***
	(0.264)	(0.206)	(0.218)	(0.285)	(0.284)	(0.208)	(0.229)	(0.271)
Population density (log)	0.203	0.119	0.127	0.058	0.189	0.049	0.080	0.004
	(0.161)	(0.191)	(0.155)	(0.208)	(0.153)	(0.163)	(0.153)	(0.200)
CNDD	-1.016	-1.593*	-0.966	-1.327	-0.692**	-0.825**	-0.620**	-0.902**
	(1.016)	(0.947)	(1.034)	(1.054)	(0.326)	(0.402)	(0.294)	(0.424)
FNL - Rwasa	0.537	0.979	1.006*	1.254*	0.003	-0.243	-0.039	-0.126
	(0.588)	(0.653)	(0.602)	(0.707)	(0.276)	(0.290)	(0.281)	(0.286)
FNL Dissidents	-2.023	-0.593	-1.236	-1.226	-1.447**	-1.612***	-1.407***	-1.727***
	(2.113)	(2.186)	(2.067)	(2.447)	(0.613)	(0.335)	(0.438)	(0.456)
FNL Icanzo	10.364**	12.155***	9.892***	13.493***	5.393**	5.440***	5.061***	5.983***
	(4.964)	(3.556)	(3.675)	(4.272)	(2.508)	(1.600)	(1.912)	(1.751)
Frolina	1.239*	1.482*	1.460**	1.657	0.639**	0.536*	0.632**	0.622
	(0.705)	(0.829)	(0.724)	(1.062)	(0.297)	(0.301)	(0.276)	(0.426)
KAZE-FDD	0.617	3.997	2.832	3.798	1.201	1.937***	1.648**	2.105**
	(2.143)	(2.458)	(2.157)	(2.980)	(0.819)	(0.740)	(0.769)	(0.905)
Palipe Agazika	-2.046	-1.143	-1.831	-1.027	-0.068	0.036	0.161	-0.041
	(1.612)	(1.474)	(1.539)	(1.670)	(0.617)	(0.577)	(0.649)	(0.588)
Observations	128	1388	822	256	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 A.5: With the proportion of voters for each parties

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	0.976	0.719	1.045	1.008
	(1.190)	(1.467)	(1.249)	(2.082)
Ethnic fractionalization 2012 (st.)	0.115	-0.019	0.056	0.050
	(0.155)	(0.188)	(0.167)	(0.239)
Political fractionalization 2010 (st.)	0.476	0.833**	0.643*	0.608
	(0.400)	(0.324)	(0.350)	(0.382)
Demob. rebels' polarization (st.)	0.324**	0.376***	0.300**	0.367**
	(0.134)	(0.125)	(0.120)	(0.149)
Demob. rebels' fractionalization (st.)	-0.136	-0.068	-0.083	-0.078
	(0.154)	(0.159)	(0.150)	(0.179)
No. demob. rebels (/1000)	-0.031	0.023	0.009	0.019
	(0.060)	(0.061)	(0.055)	(0.061)
Past violence (log)	0.231***	0.083	0.105	0.098
	(0.079)	(0.096)	(0.085)	(0.098)
Median Wealth Index (st.)	-0.085	-0.250	-0.120	-0.167
	(0.168)	(0.155)	(0.162)	(0.168)
Population (log)	0.868***	1.268***	1.199***	1.340***
	(0.267)	(0.246)	(0.227)	(0.301)
Population density (log)	0.220	-0.038	0.050	-0.212
	(0.146)	(0.184)	(0.173)	(0.219)
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 A.6: Without Bujumbura Mairie

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	2.048	5.227**	4.659**	6.058**
	(1.614)	(2.142)	(1.937)	(2.517)
Ethnic fractionalization 2012 (st.)	0.025	0.358	0.294	0.454
	(0.203)	(0.261)	(0.243)	(0.294)
Political fractionalization 2010 (st.)	-0.010	0.251*	0.195	0.286*
	(0.131)	(0.132)	(0.129)	(0.168)
Demob. rebels' polarization (st.)	0.441***	0.444***	0.403***	0.465***
	(0.133)	(0.116)	(0.115)	(0.136)
Demob. rebels' fractionalization (st.)	-0.205	-0.051	-0.079	-0.050
	(0.151)	(0.128)	(0.132)	(0.149)
No. demob. rebels (/1000)	-0.107*	-0.087*	-0.078	-0.058
	(0.059)	(0.050)	(0.055)	(0.060)
Past violence (log)	0.326***	0.375***	0.356***	0.344***
	(0.089)	(0.124)	(0.109)	(0.127)
Median Wealth Index (st.)	0.059	0.066	0.091	0.061
	(0.098)	(0.081)	(0.087)	(0.082)
Population (log)	0.626**	0.751***	0.791***	0.820***
	(0.266)	(0.238)	(0.252)	(0.275)
Population density (log)	0.270	0.208	0.168	0.135
	(0.252)	(0.323)	(0.277)	(0.338)
Observations	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 A.7: Rebels' indicators by their municipality of origin

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	1.125	2.785**	2.327**	3.067*
	(0.893)	(1.217)	(1.177)	(1.656)
Ethnic fractionalization 2012 (st.)	-0.037	0.126	0.059	0.144
	(0.117)	(0.159)	(0.147)	(0.213)
Political fractionalization 2010 (st.)	0.056	0.517***	0.365**	0.520**
	(0.131)	(0.146)	(0.148)	(0.218)
Demob. rebels' polarization (st.)	0.372***	0.340***	0.340***	0.326**
	(0.118)	(0.108)	(0.109)	(0.142)
Demob. rebels' fractionalization (st.)	-0.217	-0.098	-0.139	-0.080
	(0.134)	(0.095)	(0.107)	(0.145)
No. demob. (/1000)	-0.079	0.019	0.002	0.048
	(0.063)	(0.061)	(0.065)	(0.074)
Past violence (log)	0.273***	0.090	0.093	0.056
	(0.087)	(0.102)	(0.109)	(0.115)
Median Wealth Index (st.)	0.055	-0.085	0.011	-0.063
	(0.138)	(0.196)	(0.176)	(0.205)
Population (log)	0.625**	1.109***	1.114***	1.157***
	(0.243)	(0.230)	(0.236)	(0.287)
Population density (log)	0.257**	0.118	0.131	0.091
	(0.118)	(0.219)	(0.156)	(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 A.8: Instrumenting ethnic diversity

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	6.988**	2.122**	4.249***	2.593
	(2.791)	(1.046)	(1.530)	(2.673)
Ethnic fractionalization 2012 (st.)	1.037***	0.206	0.559***	0.293
	(0.382)	(0.151)	(0.209)	(0.423)
Political fractionalization 2010 (st.)	-0.027	0.310*	0.275*	0.322
	(0.138)	(0.181)	(0.153)	(0.278)
Demob. rebels' polarization (st.)	0.547***	0.494***	0.456***	0.546**
	(0.132)	(0.139)	(0.130)	(0.232)
Demob. rebels' fractionalization (st.)	-0.304**	-0.001	-0.106	0.010
	(0.145)	(0.145)	(0.134)	(0.261)
No. demob. rebels (/1000)	-0.109*	-0.104**	-0.092	-0.074
	(0.066)	(0.049)	(0.059)	(0.080)
Past violence (log)	0.366***	0.411***	0.313***	0.346*
	(0.104)	(0.134)	(0.103)	(0.198)
Median Wealth Index (st.)	0.604***	0.249***	0.461***	0.827*
	(0.187)	(0.096)	(0.125)	(0.462)
Population (log)	0.934***	1.012***	1.277***	1.097
	(0.268)	(0.284)	(0.260)	(0.739)
Population density (log)	0.119	-0.037	-0.070	-0.013
	(0.169)	(0.231)	(0.162)	(0.439)
Observations	106	1174	693	215
Fixed Effects	.	All	NFE	Random
		First stages		
Hutu share, 1993 elections	0.702***	0.716***	0.754***	0.675***
	(0.168)	(0.217)	(0.161)	(0.237)
Controls	Yes	Yes	Yes	Yes
Kleibergen-Paap F-test	17.391	14.814	21.987	2.7

Table A.9: OLS

Dependent variable: total episodes of electoral violence (log (x+1))

	(1)	(2)	(3)	(4)
Hutu share 2012	0.761	2.533*	1.987*	2.894*
	(0.811)	(1.498)	(1.096)	(1.639)
Ethnic fractionalization 2012 (st.)	0.024	0.162	0.098	0.200
	(0.107)	(0.196)	(0.140)	(0.212)
Political fractionalization 2010 (st.)	-0.002	0.374**	0.245**	0.404**
	(0.090)	(0.171)	(0.120)	(0.203)
Demob. rebels' polarization (st.)	0.213**	0.209*	0.193**	0.215*
	(0.101)	(0.108)	(0.093)	(0.123)
Demob. rebels' fractionalization (st.)	-0.163*	-0.015	-0.063	-0.018
	(0.097)	(0.105)	(0.088)	(0.126)
No. demob. rebels (/1000)	-0.030	0.016	-0.002	0.037
	(0.057)	(0.070)	(0.053)	(0.066)
Past violence (log)	0.169**	0.084	0.089	0.070
	(0.084)	(0.119)	(0.096)	(0.106)
Median Wealth Index (st.)	0.103	-0.033	0.029	-0.040
	(0.116)	(0.168)	(0.128)	(0.162)
Population (log)	0.606***	0.998***	0.965***	0.978***
	(0.210)	(0.258)	(0.212)	(0.258)
Population density (log)	0.119	0.007	0.043	-0.034
	(0.122)	(0.211)	(0.147)	(0.199)
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 A.10: Poisson

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	1.158	3.202**	2.788**	3.718**
	(1.153)	(1.330)	(1.372)	(1.515)
Ethnic fractionalization 2012 (st.)	-0.040	0.092	0.046	0.160
	(0.133)	(0.168)	(0.173)	(0.187)
Political fractionalization 2010 (st.)	0.016	0.349**	0.265**	0.401***
	(0.124)	(0.136)	(0.135)	(0.154)
Demob. rebels' polarization (st.)	0.358***	0.337***	0.293**	0.351***
	(0.119)	(0.110)	(0.122)	(0.129)
Demob. rebels' fractionalization (st.)	-0.321**	-0.082	-0.120	-0.094
	(0.132)	(0.116)	(0.117)	(0.136)
No. demob. rebels (/1000)	-0.037	0.013	0.001	0.034
	(0.072)	(0.056)	(0.062)	(0.057)
Past violence (log)	0.209**	0.140	0.082	0.138
	(0.099)	(0.097)	(0.117)	(0.094)
Median Wealth Index (st.)	0.116	-0.110	0.014	-0.097
	(0.135)	(0.145)	(0.143)	(0.163)
Population (log)	0.827***	0.971***	1.082***	1.033***
	(0.286)	(0.225)	(0.231)	(0.256)
Population density (log)	0.185	0.165	0.177	0.098
	(0.121)	(0.197)	(0.166)	(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 A.11: Removing bad controls

(a) Without Past Violence

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	1.579	3.938***	3.347***	4.414***
	(0.989)	(1.326)	(1.213)	(1.577)
Ethnic fractionalization 2012 (st.)	0.005	0.222	0.154	0.274
	(0.129)	(0.169)	(0.151)	(0.189)
Political fractionalization 2010 (st.)	0.142	0.528***	0.412***	0.585***
	(0.121)	(0.150)	(0.145)	(0.187)
Demob. rebels' polarization (st.)	0.295**	0.337***	0.327***	0.346***
	(0.115)	(0.104)	(0.110)	(0.124)
Demob. rebels' fractionalization (st.)	-0.305**	-0.057	-0.124	-0.065
	(0.125)	(0.106)	(0.113)	(0.136)
No. demob. rebels (/1000)	0.029	0.047	0.040	0.073
	(0.060)	(0.055)	(0.056)	(0.058)
Population (log)	0.908***	1.285***	1.312***	1.275***
	(0.247)	(0.179)	(0.191)	(0.240)
Population density (log)	0.228**	0.160	0.158	0.100
	(0.103)	(0.213)	(0.154)	(0.213)
Median Wealth Index (st.)	0.071	-0.095	0.004	-0.109
	(0.128)	(0.144)	(0.146)	(0.156)
Observations	128	1388	822	256
Fixed Effects	.	All	NFE	Random

Clustered-robust standard errors in parentheses

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

(b) Without Wealth

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	0.917	3.590***	2.982**	3.876***
	(0.822)	(1.242)	(1.173)	(1.409)
Ethnic fractionalization 2012 (st.)	-0.101	0.120	0.054	0.158
	(0.110)	(0.157)	(0.145)	(0.173)
Political fractionalization 2010 (st.)	0.078	0.372***	0.334***	0.414***
	(0.112)	(0.122)	(0.118)	(0.144)
Demob. rebels' polarization (st.)	0.374***	0.335***	0.316***	0.346***
	(0.128)	(0.109)	(0.113)	(0.128)
Demob. rebels' fractionalization (st.)	-0.282**	-0.120	-0.147	-0.130
	(0.130)	(0.117)	(0.118)	(0.135)
No. demob. rebels (/1000)	-0.054	0.015	0.005	0.042
	(0.066)	(0.059)	(0.059)	(0.058)
Past violence (log)	0.261***	0.137	0.126	0.127
	(0.094)	(0.101)	(0.103)	(0.094)
Population (log)	0.664***	0.998***	0.981***	1.069***
	(0.230)	(0.235)	(0.237)	(0.256)
Population density (log)	0.287***	0.155	0.160	0.096
	(0.102)	(0.180)	(0.154)	(0.184)
Observations	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 A.12: Including the army and the police (% of total no. of soldiers)

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	0.976	3.059**	2.607*	3.530**
	(1.041)	(1.320)	(1.334)	(1.593)
Ethnic fractionalization 2012 (st.)	-0.066	0.088	0.042	0.142
	(0.149)	(0.174)	(0.176)	(0.200)
Political fractionalization 2010 (st.)	0.059	0.395**	0.365**	0.425**
	(0.185)	(0.176)	(0.181)	(0.188)
Demob. rebels' polarization (st.)	0.387***	0.322***	0.325***	0.341***
	(0.127)	(0.108)	(0.111)	(0.129)
Demob. rebels' fractionalization (st.)	-0.266**	-0.054	-0.115	-0.065
	(0.131)	(0.114)	(0.116)	(0.138)
No. demob. rebels (/1000)	-0.055	-0.006	-0.016	0.020
	(0.075)	(0.061)	(0.062)	(0.062)
Past violence (log)	0.261***	0.117	0.099	0.113
	(0.093)	(0.097)	(0.106)	(0.095)
Median Wealth Index (st.)	0.044	-0.164	-0.071	-0.178
	(0.141)	(0.161)	(0.161)	(0.178)
Population (log)	0.704***	0.973***	1.003***	1.034***
	(0.241)	(0.240)	(0.244)	(0.260)
Population density (log)	0.263**	0.104	0.126	0.041
	(0.119)	(0.203)	(0.160)	(0.214)
FAB	-0.000	-0.001	-0.001	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)
FDN	0.000	0.001	0.001	0.001
	(0.002)	(0.002)	(0.002)	(0.002)
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 A.13: Selection on observables and unobservables

Dependent variable: total episodes of electoral violence

	Restricted	Unrestricted	Unrestricted		
	No FE	No FE	With Tight Fixed Effects		
	(1)	(2)	(3)	(4)	(5)
Hutu share 2012	0.935	1.187	2.948**	2.629**	3.405**
	(1.043)	(0.944)	(1.331)	(1.260)	(1.490)
Ethnic fractionalization 2012 (st.)	-0.058	-0.014	0.126	0.091	0.178
	(0.134)	(0.127)	(0.167)	(0.158)	(0.182)
Political fractionalization 2010 (st.)	0.105	0.038	0.369***	0.323***	0.365**
	(0.112)	(0.105)	(0.126)	(0.114)	(0.145)
Demob. rebels' polarization (st.)	0.215	0.386***	0.337***	0.342***	0.343***
	(0.134)	(0.131)	(0.102)	(0.110)	(0.122)
Demob. rebels' fractionalization (st.)	-0.156	-0.267**	-0.056	-0.125	-0.056
	(0.130)	(0.134)	(0.105)	(0.115)	(0.130)
No. demob. rebels (/1000)		-0.056	0.020	0.020	0.039
		(0.066)	(0.062)	(0.062)	(0.059)
Past violence (log)		0.286***	0.144	0.127	0.152
		(0.096)	(0.104)	(0.109)	(0.100)
Median Wealth Index (st.)		0.084	-0.118	-0.026	-0.111
		(0.127)	(0.150)	(0.151)	(0.165)
Population (log)		0.759***	1.076***	1.161***	1.074***
		(0.233)	(0.223)	(0.234)	(0.246)
Population density (log)		0.284**	0.131	0.160	0.078
		(0.114)	(0.200)	(0.157)	(0.209)
Observations	129	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 A.14: Without Outliers

Dependent variable: total episodes of electoral violence

	(1)	(2)	(3)	(4)
Hutu share 2012	1.139	3.668***	2.901***	3.781***
	(0.864)	(1.150)	(1.118)	(1.449)
Ethnic fractionalization 2012 (st.)	-0.050	0.119	0.057	0.140
	(0.112)	(0.152)	(0.137)	(0.176)
Political fractionalization 2010 (st.)	0.111	0.508***	0.376***	0.354**
	(0.112)	(0.130)	(0.132)	(0.141)
Demob. rebels' polarization (st.)	0.433***	0.442***	0.359***	0.475***
	(0.117)	(0.099)	(0.101)	(0.123)
Demob. rebels' fractionalization (st.)	-0.366***	-0.199**	-0.201*	-0.254*
	(0.124)	(0.101)	(0.109)	(0.131)
No. demob. rebels (/1000)	-0.009	-0.022	-0.020	0.023
	(0.055)	(0.049)	(0.050)	(0.055)
Past violence (log)	0.225***	0.230***	0.234***	0.159*
	(0.073)	(0.084)	(0.084)	(0.086)
Median Wealth Index (st.)	0.035	-0.056	0.008	-0.015
	(0.140)	(0.130)	(0.150)	(0.156)
Population (log)	0.832***	0.913***	0.944***	1.029***
	(0.215)	(0.192)	(0.204)	(0.243)
Population density (log)	0.314***	0.390**	0.281**	0.295
	(0.088)	(0.194)	(0.141)	(0.187)
Observations	121	1330	786	238
Fixed Effects	.	All	NFE	Random

Clustered-robust standard errors in parentheses

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

Table A.15: Spatial dependence

	Negative binomial				(Spatial) linear regressions					Conley			
	Benchmark	Polynomial coord.	Spatial lag violence	Spatial lag coord.	Benchmark OLS	WM neighbor Lag	WM neighbor Error	WM coord. Lag	WM coord. Error	5km		10km	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Hutu share 2012	1.075	1.784	1.213	1.123	0.761	0.774	0.742	0.831	0.763	0.761		0.761	
	(0.967)	(1.431)	(0.952)	(0.906)	(0.811)	(0.766)	(0.817)	(0.779)	(0.766)	(0.622)		(0.677)	
Ethnic fractionalization 2012 (st.)	-0.079	0.018	-0.069	-0.061	0.024	0.026	0.024	0.032	0.025	0.024		0.024	
	(0.131)	(0.154)	(0.130)	(0.121)	(0.107)	(0.102)	(0.101)	(0.102)	(0.101)	(0.078)		(0.074)	
Political fractionalization 2010 (st.)	0.051	0.168	0.011	0.053	-0.002	-0.007	-0.007	-0.005	-0.002	-0.002	0.328**	-0.002	0.328***
	(0.120)	(0.145)	(0.123)	(0.119)	(0.090)	(0.086)	(0.098)	(0.088)	(0.087)	(0.082)	(0.129)	(0.085)	(0.103)
Demob. rebels' polarization (st.)	0.347***	0.303**	0.340***	0.383***	0.213**	0.213**	0.213**	0.215**	0.214**	0.213**	0.207**	0.213**	0.207*
	(0.126)	(0.137)	(0.127)	(0.128)	(0.101)	(0.096)	(0.096)	(0.096)	(0.098)	(0.099)	(0.104)	(0.104)	(0.114)
Demob. rebels' fractionalization (st.)	-0.280**	-0.176	-0.294**	-0.273**	-0.163*	-0.166*	-0.166*	-0.161*	-0.163*	-0.163*	-0.023	-0.163	-0.023
	(0.129)	(0.140)	(0.134)	(0.132)	(0.097)	(0.094)	(0.100)	(0.093)	(0.093)	(0.091)	(0.087)	(0.098)	(0.092)
No. demob. rebels (/1000)	-0.016	0.014	-0.015	-0.054	-0.030	-0.029	-0.030	-0.031	-0.030	-0.030	0.077	-0.030	0.077
	(0.060)	(0.063)	(0.060)	(0.067)	(0.057)	(0.054)	(0.054)	(0.054)	(0.054)	(0.067)	(0.075)	(0.068)	(0.057)
Past violence (log)	0.178*	0.118	0.180**	0.263***	0.169**	0.168**	0.169**	0.166**	0.169**	0.169*	0.041	0.169*	0.041
	(0.091)	(0.107)	(0.091)	(0.094)	(0.084)	(0.080)	(0.080)	(0.079)	(0.078)	(0.098)	(0.093)	(0.090)	(0.081)
Median Wealth Index (st.)	0.057	0.082	0.073	0.044	0.103	0.106	0.104	0.072	0.103	0.103	-0.004	0.103*	-0.004
	(0.146)	(0.148)	(0.141)	(0.208)	(0.116)	(0.108)	(0.109)	(0.160)	(0.134)	(.)	(.)	(0.054)	(0.068)
Population (log)	0.736***	0.944***	0.669***	0.749***	0.606***	0.600***	0.601***	0.630***	0.607***	0.606***	1.028***	0.606***	1.028***
	(0.245)	(0.282)	(0.259)	(0.238)	(0.210)	(0.203)	(0.208)	(0.195)	(0.200)	(0.200)	(0.216)	(0.210)	(0.220)
Population density (log)	0.258**	0.262*	0.283**	0.231	0.119	0.123	0.120	0.071	0.117	0.119	-0.061	0.119**	-0.061
	(0.115)	(0.151)	(0.120)	(0.164)	(0.122)	(0.118)	(0.118)	(0.133)	(0.121)	(0.076)	(0.167)	(0.050)	(0.136)
Spatial lag log total episodes			-0.201										
			(0.162)										
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)											
Observations	128	128	128	128	128	128	128	128	128	128	128	128	128
Fixed Effects	.	.	.	.	.	.	.	.	.	.	Province	.	Province

Clustered-robust standard errors in parentheses

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

Table A.16: Placebo tests

	Dependent variable: total episodes of electoral violence							
	Age-groups				Religion			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Hutu share 2012	-0.091	1.750	1.433	2.470*	0.715	2.687**	2.197*	3.401**
	(1.099)	(1.216)	(1.200)	(1.446)	(0.909)	(1.285)	(1.225)	(1.486)
Ethnic fractionalization 2012 (st.)	-0.075	0.044	-0.019	0.116	-0.068	0.112	0.050	0.148
	(0.139)	(0.155)	(0.152)	(0.170)	(0.124)	(0.164)	(0.152)	(0.180)
Political fractionalization 2010 (st.)	-0.036	0.437***	0.301**	0.478**	0.022	0.444***	0.307**	0.383**
	(0.135)	(0.160)	(0.152)	(0.190)	(0.131)	(0.151)	(0.145)	(0.153)
Religious polarization (st.)					-0.111	0.001	-0.045	-0.006
					(0.087)	(0.088)	(0.086)	(0.091)
Age-group polarization (st.)	-0.032	-0.160	-0.115	-0.142				
	(0.107)	(0.102)	(0.097)	(0.101)				
Demob. rebels' fractionalization (st.)	0.009	0.214***	0.128	0.207**	-0.016	0.191**	0.103	0.163
	(0.103)	(0.082)	(0.087)	(0.101)	(0.104)	(0.087)	(0.091)	(0.103)
No. demob. rebels (/1000)	-0.014	0.035	0.019	0.058	-0.055	0.024	0.013	0.014
	(0.076)	(0.063)	(0.063)	(0.062)	(0.074)	(0.059)	(0.059)	(0.054)
Past violence (log)	0.210**	0.155	0.142	0.149	0.223**	0.131	0.120	0.143
	(0.092)	(0.107)	(0.106)	(0.101)	(0.099)	(0.105)	(0.106)	(0.095)
Median Wealth Index (st.)	0.184	-0.217	-0.098	-0.203	0.038	-0.144	-0.021	-0.091
	(0.130)	(0.149)	(0.143)	(0.156)	(0.151)	(0.160)	(0.159)	(0.158)
Population (log)	0.746**	1.150***	1.121***	1.110***	0.686**	1.022***	1.057***	0.908***
	(0.291)	(0.257)	(0.249)	(0.265)	(0.282)	(0.259)	(0.258)	(0.280)
Population density (log)					0.308**	0.080	0.108	0.012
					(0.123)	(0.206)	(0.157)	(0.188)
Observations	128	1388	822	256	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 A.17: Falsification: Yearly records of attacks against civilians

	(1) 1997	(2) 1998	(3) 1999	(4) 2000	(5) 2001	(6) 2002	(7) 2003	(8) 2004	(9) 2005	(10) 2006
Hutu share 2012	9.735***	7.527***	1.064	3.286	3.479*	6.893***	8.379***	-0.386	0.809	14.550***
	(3.290)	(2.847)	(2.633)	(2.235)	(1.797)	(2.166)	(2.902)	(3.827)	(3.440)	(5.325)
Ethnic fractionalization 2012 (st.)	1.023***	0.768**	1.162***	0.463*	0.439**	0.871***	0.442**	-0.917**	0.456*	0.344
	(0.330)	(0.345)	(0.353)	(0.242)	(0.196)	(0.272)	(0.224)	(0.425)	(0.266)	(0.389)
Political fractionalization 2010 (st.)	1.991***	-0.073	0.151	0.486*	0.317	0.949***	0.352	-0.154	0.272	-0.085
	(0.424)	(0.529)	(0.459)	(0.259)	(0.233)	(0.305)	(0.286)	(0.434)	(0.384)	(0.489)
Demob. rebels' polarization (st.)	-0.424**	0.487	0.418	0.173	0.362**	-0.176	0.083	-0.542	0.414	-0.363
	(0.195)	(0.305)	(0.445)	(0.214)	(0.152)	(0.229)	(0.245)	(0.344)	(0.320)	(0.389)
Demob. rebels' fractionalization (st.)	0.757***	-0.188	-0.420	-0.402**	-0.242	0.196	-0.251	-0.064	-0.186	-0.206
	(0.180)	(0.321)	(0.540)	(0.180)	(0.162)	(0.236)	(0.288)	(0.317)	(0.374)	(0.547)
No. demob. rebels (/1000)	0.497***	0.024	0.303**	0.059	0.074	0.318***	0.057	-0.588***	0.161*	0.166*
	(0.095)	(0.124)	(0.139)	(0.062)	(0.060)	(0.068)	(0.075)	(0.152)	(0.098)	(0.090)
Median Wealth Index (st.)	-1.270*	0.081	0.272	0.050	-0.490***	0.208	-0.027	-3.717***	0.146	0.097
	(0.648)	(0.377)	(0.330)	(0.234)	(0.177)	(0.216)	(0.275)	(0.841)	(0.340)	(0.480)
Population (log)	-0.003	1.935***	2.454***	2.428***	1.854***	1.646***	1.476***	-0.488	3.294***	1.033
	(0.418)	(0.668)	(0.919)	(0.330)	(0.301)	(0.393)	(0.448)	(0.612)	(1.226)	(1.257)
Population density (log)	0.511	1.215***	0.973***	-0.020	0.375**	0.256	1.329***	1.399***	0.328	1.522***
	(0.409)	(0.255)	(0.277)	(0.226)	(0.175)	(0.214)	(0.239)	(0.286)	(0.265)	(0.453)
Observations	822	822	822	822	822	822	822	822	822	822
Fixed Effects	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE
Total no. of events	83	50	68	339	362	241	77	44	24	49

Clustered-robust standard errors in parentheses

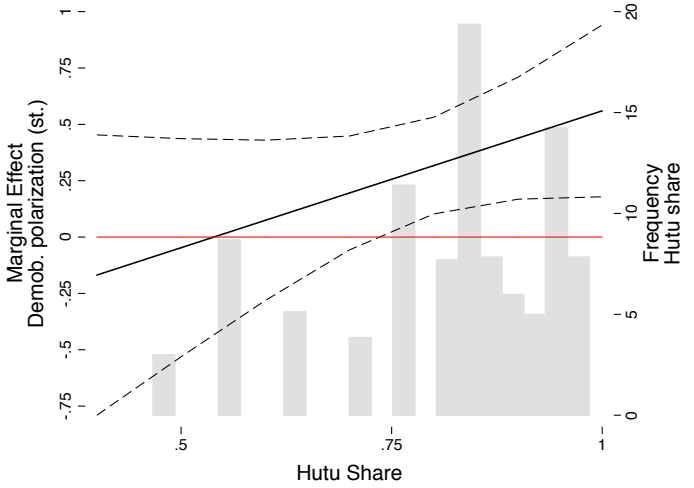
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.18: Falsification: Yearly records of battles

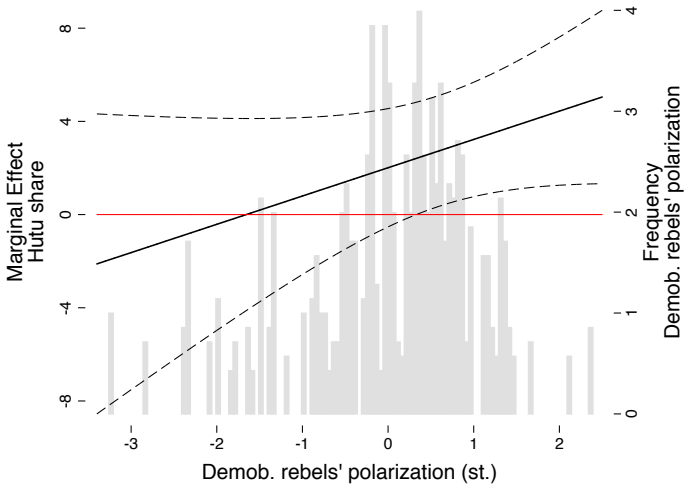
	(1) 1997	(2) 1998	(3) 1999	(4) 2000	(5) 2001	(6) 2002	(7) 2003	(8) 2004	(9) 2005	(10) 2006
Hutu share 2012	7.502***	9.174***	3.542	-4.208**	0.035	3.365**	3.627**	7.957*	6.700**	4.232
	(2.301)	(2.919)	(3.144)	(1.755)	(2.084)	(1.486)	(1.564)	(4.358)	(2.614)	(4.074)
Ethnic fractionalization 2012 (st.)	0.716***	0.664**	0.432	-0.433*	-0.151	0.463**	0.226	0.909**	1.220***	0.284
	(0.192)	(0.260)	(0.312)	(0.228)	(0.223)	(0.213)	(0.168)	(0.380)	(0.239)	(0.374)
Political fractionalization 2010 (st.)	1.395***	1.023**	0.879***	0.328	0.613***	0.867***	0.239	2.698***	0.748**	0.165
	(0.266)	(0.412)	(0.341)	(0.244)	(0.202)	(0.215)	(0.253)	(0.752)	(0.313)	(0.352)
Demob. rebels' polarization (st.)	-0.220	-0.728**	-0.394	-0.190	-0.160	0.043	0.319*	-0.569*	0.787***	0.194
	(0.234)	(0.297)	(0.330)	(0.199)	(0.132)	(0.154)	(0.192)	(0.325)	(0.213)	(0.329)
Demob. rebels' fractionalization (st.)	0.192	0.585**	0.221	-0.161	-0.073	-0.081	-0.133	0.570	-0.258	0.499*
	(0.248)	(0.296)	(0.355)	(0.190)	(0.145)	(0.167)	(0.212)	(0.474)	(0.267)	(0.298)
No. demob. rebels (/1000)	0.254***	0.220***	0.107	0.083	0.068	0.139***	-0.066	0.166	0.332***	0.107
	(0.061)	(0.080)	(0.112)	(0.067)	(0.062)	(0.050)	(0.055)	(0.135)	(0.081)	(0.069)
Median Wealth Index (st.)	-1.990***	-0.735	-0.851*	-0.432*	0.090	0.275	-0.157	-1.811*	0.614**	-0.143
	(0.511)	(0.616)	(0.480)	(0.263)	(0.145)	(0.173)	(0.315)	(0.926)	(0.247)	(0.341)
Population (log)	0.967**	2.165***	2.413***	1.694***	1.668***	1.778***	2.106***	2.295**	2.974***	1.308**
	(0.403)	(0.486)	(0.625)	(0.380)	(0.276)	(0.317)	(0.335)	(1.037)	(0.592)	(0.653)
Population density (log)	1.390***	0.704*	1.196***	0.097	-0.060	0.177	0.716***	0.882***	0.509**	0.065
	(0.303)	(0.418)	(0.287)	(0.189)	(0.150)	(0.166)	(0.196)	(0.325)	(0.222)	(0.372)
Observations	822	822	822	822	822	822	822	822	822	822
Fixed Effects	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE	NFE
Total no. of events	125	58	93	151	250	189	131	29	45	52

Clustered-robust standard errors in parentheses

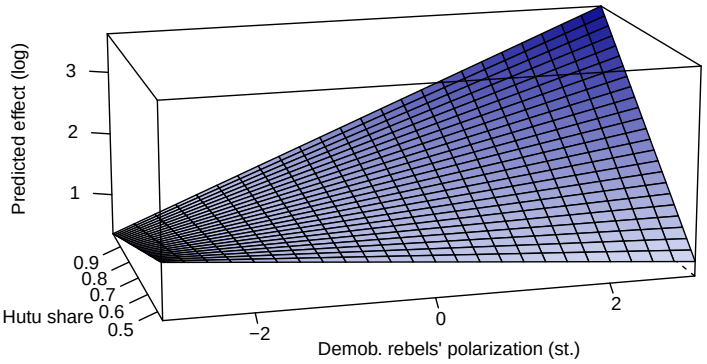
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$



(a) Marginal effect of demob. rebels' polarization as a function of Hutu share (95% CI)

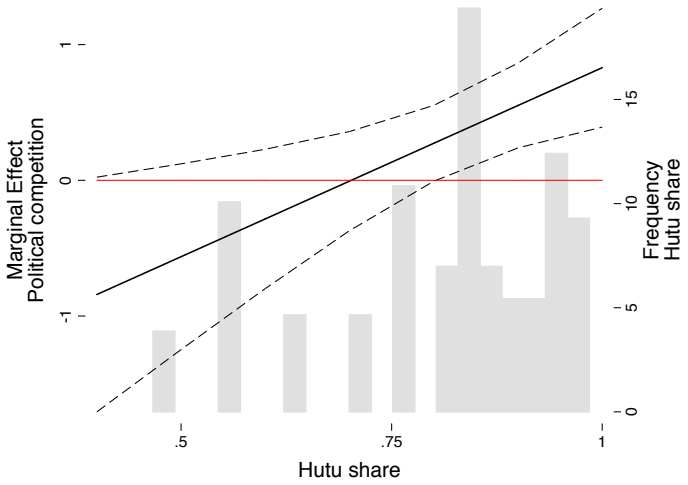


(b) Marginal effect of Hutu share as a function of demob. rebels' polarization (95% CI)

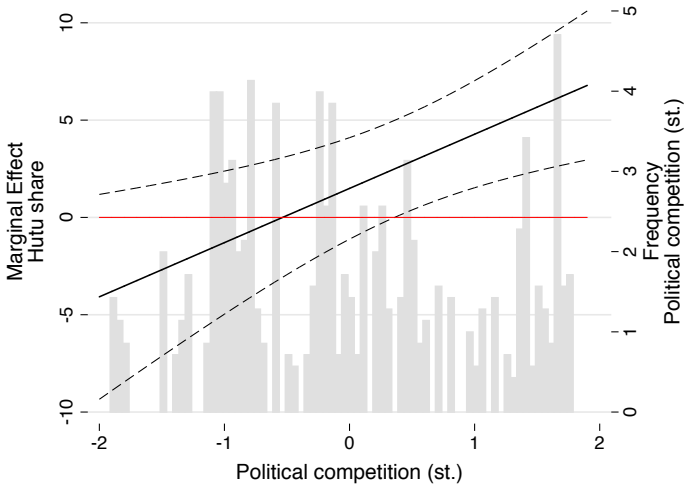


(c) Joint predicted effect of Hutu share and demob. rebels' polarization

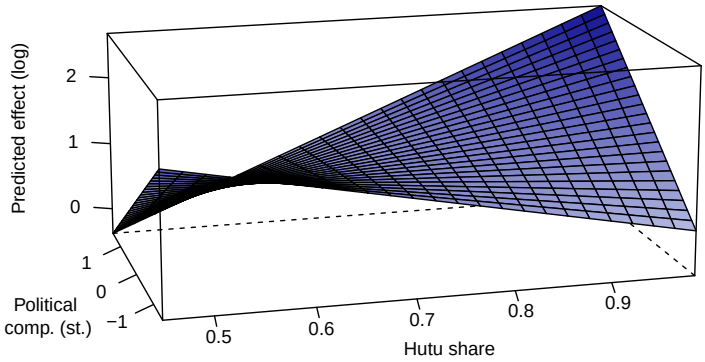
Figure A.1: Interactions: demob. rebels' polarization and Hutu share



(a) Marginal effect of political competition as a function of Hutu share (95% CI)

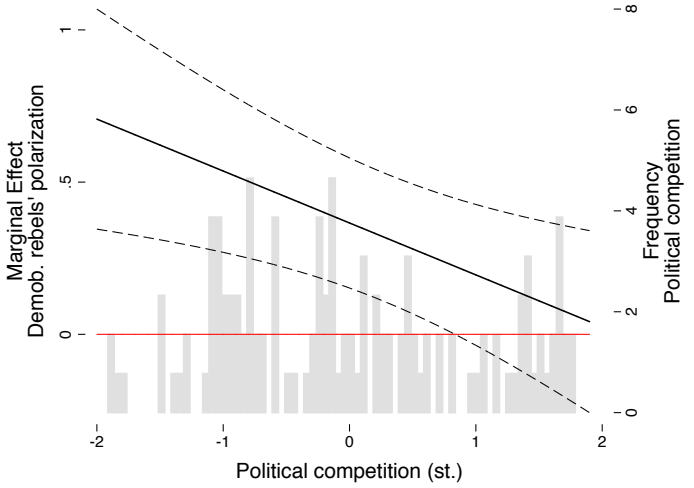


(b) Marginal effect of Hutu share as a function of political competition (95% CI)

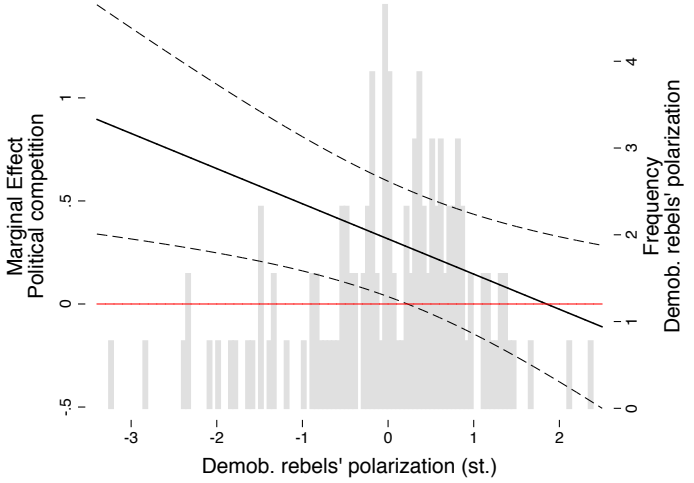


(c) Joint predicted effect of Hutu share and political competition

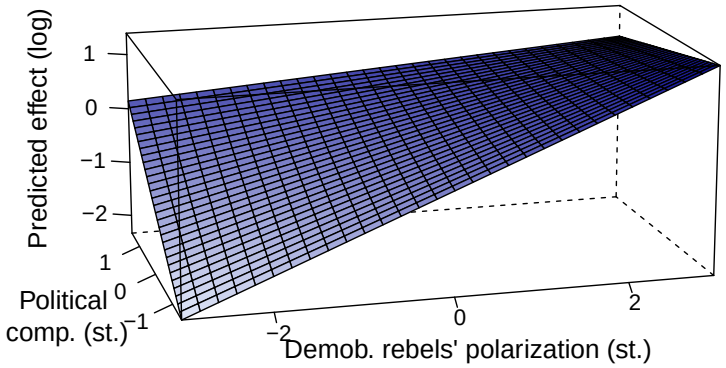
Figure A.2: Interactions: Political competition and Hutu share



(a) Marginal effect of demob. rebels' polarization as a function of political competition (95% CI)

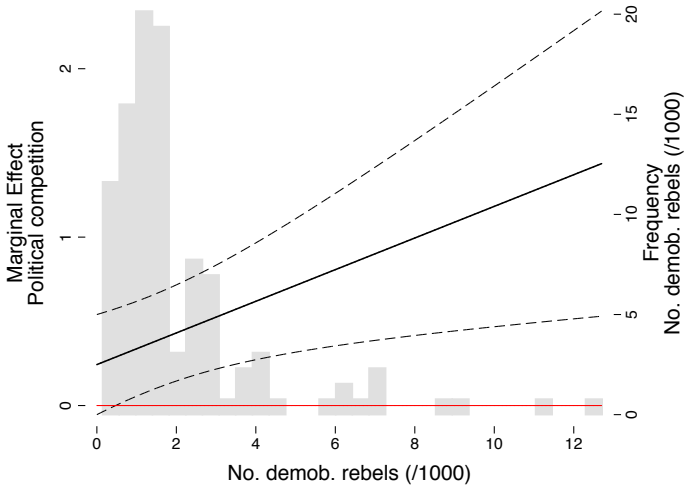


(b) Marginal effect of political competition as a function of demob. rebels' polarization (95% CI)

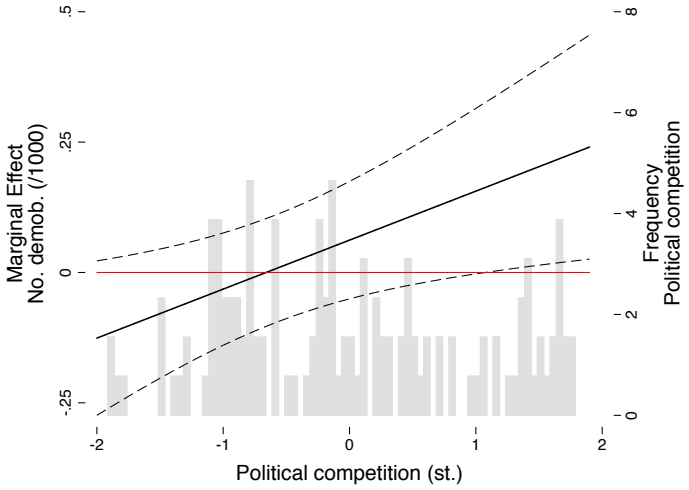


(c) Joint predicted effect of ex-rebels' polarization and political competition

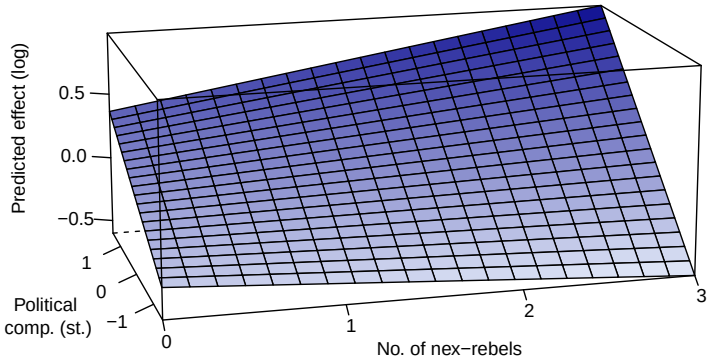
Figure A.3: Interactions: demob. rebels' polarization and political competition



(a) Marginal effect of political competition as a function of the no. of demob. rebels. (95% CI)



(b) Marginal effect of the no. of demob. rebels as a function of political competition (95% CI)



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

Figure A.4: Interactions: no. of demobilized rebels and political competition