<u>Supplementary Information for</u>

<u>Elections and Collective Action: Evidence from Changes in Traditional Institutions in Liberia</u>

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A. Robustness Tests: Re-running models with additional covariates

We have re-run the regression models presented in tables 6 and 7 in the main article with additional covariates. These results are presented in tables 11 and 12 below.

The outcomes in table 11 are measured at the individual-level. These models include controls for the age of the respondent, gender, whether the respondent had any formal education, and an index of their household's possessions in 1999. In addition, the models include five community-level covariates from table 3 –whether the clan experienced violent conflict during the war, the proportion of respondents working in agriculture in 1999, the proportion of respondents who belonged to at least one association in 1989, the proportion of respondents who hid from rebels during the war, and the proportion of respondents with family members injured by an armed group. We include these variables because – although the differences in the means of these variables across treatment groups are not statistically significant – they are the variables with the five lowest p-values in table 4. In addition, we control for whether there is a peacekeeping base in the clan, given the importance of this variable in determining the sample.

The outcome in table 12 is measured at the community-level. As a result, only the six community-level covariates (whether the clan experienced violent events during the war, the proportion of respondents working in agriculture in 1999, the proportion of respondents who belonged to at least one association in 1989, the proportion of respondents who hid from rebels during the war, the proportion of respondents with family members injured by an armed group, and whether there is a peacekeeping base in the clan) are included in this model.

Overall, the results are similar to the results from the models with no covariates. In table 11, the effect of elections on the national-level participation index is now marginally statistically significant (at the 90 percent confidence level). In table 12, the negative effect of elections on contributions is identical in size, though it now just missed statistical significance at the 90 percent confidence level.

Table 11. Effects of Elections on Collective Action

Community-level participation	
Whether attended community meetings	-0.042 (0.069) N=805
Whether spoke at community meetings	0.041 (0.075) N=786
Whether met with clan chief	0.157* (0.080) N=787
Index of community participation	0.125 (0.177) N=808
National-level participation	
Whether met political representative	0.100 (0.082) N=794
Whether called radio program	0.054 (0.045) N=800
Whether attended political rally	0.127 (0.078) N=785
Index of national-level participation	0.335* (0.174) N=810
"Contentious" participation	
Whether attended peaceful protest	0.155*** (0.057) N=800
Whether participated in violent protest/riot	0.088*** (0.031) N=795
Whether participated in "vigilantism"	0.034 (0.063) N=794
Index of "contentious" participation	0.524*** (0.169) N=812
Table displays coefficients δ with standard errors clustered by clan in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Table 12. Effects of Elections on Contributions

Average amount contributed in public goods game	-13.9 (8.4) N=58
Table displays coefficients δ with robust standard errors in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section B. Wild-Bootstrap Method for Standard Errors

We have 60 clans in our study, which is above the minimum recommended to calculate cluster-robust standard errors using the adjustment proposed by White (1984). However, as a robustness check, we have also used the wild-bootstrap method proposed by Cameron, Gelbach and Miller (2008) for studies with few clusters. The results, presented in table 13, do not result in many differences in our calculations of statistical significance. The statistical significance of the effect of elections on whether respondents had met the clan chief dropped to the 95 percent confidence level from the 99 percent confidence level, and the effect of elections on whether respondents had attended a peaceful protest dropped to the 90 percent confidence level from the 95 percent confidence level. The statistical significance of the effects of clan chief elections on our indices of participation remain unchanged.

Table 13. Results Using Wild-Bootstrap Method for Calculating Standard Errors

Community-level participation	
Whether attended community meetings	-0.043 (-0.177, 0.092) p=0.594 N=886
Whether spoke at community meetings	0.040 (-0.134, 0.210) p=0.666 N=867
Whether met with clan chief	0.196** (0.066, 0.325) p=0.014 N=867
Index of community participation	0.161 (-0.181, 0.508) p=0.424 N=889
National-level participation	
Whether met political representative	0.119 (-0.039, 0.291) p=0.214

	N=872
Whether called radio program	0.033
	(-0.068, 0.136)
	p=0.610
	N=877
Whether attended political rally	0.073
	(-0.088, 0.252)
	p=0.434
	N=865
Index of national-level participation	0.269
	(-0.115, 0.691)
	p=0.230
	N=892
"Contentious" participation	
Whether attended peaceful protest	0.136*
	(0.011, 0.267)
	p=0.088
	N=880
Whether participated in violent protest/riot	0.076**
	(0.016, 0.137)
	p=0.034
	N=875
Whether participated in "vigilantism"	0.059
	(-0.042, 0.159)
	p=0.284
	N=875
Index of "contentious" participation	0.505***
	(0.241, 0.784)
	p=0.000
	N=895
Table displays coefficients δ. It reports 95 % confidence levels in parentheses, calculating standard errors clustered at the clan level by the wild bootstrap method. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section C. Effect of Introduction of Elections without Accounting for Trend

In our main analysis, we have used a difference-in-difference estimation strategy to identify the impact of institutional change independent of trend effects, such as the effect of having a new leader. As explained in the paper, our estimator is:

$$\delta_1 = (\bar{y}_{B2}\text{-}\bar{y}_{B1}) - (\bar{y}_{A2}\text{-}\bar{y}_{A1})$$

The assumption is that the trends in these two sets of communities would be the same in the absence of an institutional change in the communities in group B.

In tables 14 and 15, we present the estimated effects of clan chief elections if we do not account for the trend variable. In these tables, the effect of clan chief elections is calculated as follows:

$$\delta_2 = (\bar{y}_{B2} - \bar{y}_{B1})$$

δ_2 conflates the effects of elections with the effects of getting a new leader, and so we believe δ_1 is a superior estimator, but we present these results as a robustness check.

We continue to find that clan chief elections do not significantly increase community-level participation or national-level participation. We also continue to find that clan chief elections significantly increase contentious participation. We find that clan chief elections are associated with lower contribution levels in public goods games, although this result is no longer statistically significant. Thus, the results are broadly similar to those estimated using a difference-in-difference framework, and continue to depart from the effects observed in field and lab experiments.

Table 14. Effects on Participation without Accounting for Trend

Community-level participation	
Whether attended community meetings	-0.020 (0.051) N=439
Whether spoke at community meetings	0.015 (0.056) N=428
Whether met with clan chief	0.077 (0.058) N=426
Index of community participation	0.057 (0.128) N=440
National-level participation	
Whether met political representative	0.081 (0.051) N=430
Whether called radio program	0.012 (0.035) N=434
Whether attended political rally	0.044 (0.059) N=431
Index of national-level participation	0.147 (0.108) N=442

"Contentious" participation	
Whether attended peaceful protest	0.060*
	(0.031)
	N=437
Whether participated in violent protest/riot	0.056**
	(0.027)
	N=435
Whether participated in "vigilantism"	0.040
	(0.051)
	N=432
Index of "contentious" participation	0.309***
	(0.101)
	N=444
Table displays coefficients δ with standard errors clustered by clan in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Table 15. Effects on Public Goods without Accounting for Trend

Average amount contributed in public goods game	-7.73
	(6.53)
	N=30
Table displays coefficients δ with robust standard errors in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section E. Testing for Interactions Between Elections and Leader Tenure

One of the assumptions of our identification strategy is that there are no interactions between the effect of getting a new leader and the effects of elections. In other words, the effect of getting a new leader on the outcomes of interest should be the same in clans using electoral and non-electoral processes.

We can test whether the effect of leaders' tenure is different in electoral and non-electoral regimes using our data. However, in order to compare elected and unelected chiefs with similar lengths of tenure, we have to restrict our sample to clans where the chief has not changed post war (the clans falling in cells A1 and B1 in table 3); this truncates our tenure variable, removing clans with very new chiefs. In addition, we consider only the clans in cells A1 and B1 where the current chief was installed by the same procedure as his predecessor.

Using this subset of the data, we test whether the number of years the chief has been in power differentially affects citizen participation in electoral and non-electoral regimes, and we do not find interactions between the effects of elections and leadership tenure.

Table 16: Interaction Effects Between Electoral Regimes and New Leaders on Participation

Index of community participation	0.008 (0.015) N=324
Index of national-level participation	0.018 (0.033) N=326
Index of "contentious" participation	0.014 (0.015) N=327
Average amount contributed in public goods game	-0.104 (1.33) N=22
Table displays the interaction term between the number of years the chief had been in power and whether he was elected, with standard errors clustered by clan in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section F. Testing for Interactions Between War Experience and Chief Turnover

Another potential violation of the parallel trends assumption would exist if the effect of getting a new leader differs, even in the absence of an institutional change, depending on the extent to which a community was affected by the war. In order to rule this out, table 17 analyzes whether there are interactions between getting a new chief and whether a clan was the site of violent conflict during the civil war on our four main outcomes of interest. There are not significant interactions between violence and the replacement of the chief on any of our indices of participation. We also do not find a statistically significant interaction effect on contributions to public goods.

Table 17: Interaction Effects Between War Experience and Chief Turnover

Index of community participation	-0.100 (0.215) N=889
Index of national-level participation	0.120 (0.200) N=892
Index of "contentious" participation	-.219 (0.189) N=895
Average amount contributed in public goods game	9.24 (8.42) N=58

Table displays the interaction term between whether a clan experienced violent conflict during the war and whether the chief changed after the war, with standard errors clustered by clan in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.

Section G. Elections and Security Concerns

One characteristic that the electorate may have prioritized in selecting clan chiefs after the war could have been the ability to keep the community secure. In particular, leaders who were considered particularly effective fighters during the conflict may have been favored by the electorate. Although we do not know the perceived effectiveness of chiefs in keeping the community secure, we do know whether the clan chief said security concerns/preventing violence was one of the most important components of their job. Table 18 shows that elected chiefs were no more or less likely than appointed chiefs to prioritize security concerns.

Table 18. Effects of Elections on Whether Chief Prioritizes Security Concerns

Prioritize preventing violence and security concerns	-0.153
	(0.259)
	N=60
Table displays coefficients δ with standard errors clustered by clan in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section H. Elections and Citizens' Exposure to NGOs

Table 19 examines whether citizens are more likely to report greater exposure to NGOs and human rights programming in communities where clan chiefs are elected. It shows no association between clan chief elections and citizens' exposure to NGOs.

Table 19. Effect of Elections on Citizens' Exposure to NGOs

NGO Exposure	
Proportion Citizens Belonging to HR Groups	0.018
	(0.058)
	N=60
Proportion Citizens Aware of HR Groups	0.068
	(0.105)
	N=60

Proportion Citizens Attended HR Seminars	0.003 (0.084) N=60
Table displays coefficients δ with standard errors clustered by clan in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section I. Results with All Data Aggregated to Clan Level

In table 20, we show that the effects of elections on participation levels are very similar if we aggregate our measures at the clan-level and run a clan-level analysis.

Table 20. Effects of Elections on Collective Action at Clan Level

Community-level participation	
Whether attended community meetings	-0.055 (0.068) N=60
Whether spoke at community meetings	0.059 (0.095) N=60
Whether met with clan chief	0.209*** (0.073) N=60
Index of community participation	0.163 (0.188) N=60
National-level participation	
Whether met political representative	0.107 (0.095) N=60
Whether called radio program	0.026 (0.058) N=60
Whether attended political rally	0.079 (0.103) N=60
Index of national-level participation	0.255 (0.247) N=60
"Contentious" participation	
Whether attended peaceful protest	0.122* (0.070) N=60

Whether participated in violent protest/riot	0.084** (0.034) N=60
Whether participated in "vigilantism"	0.060 (0.056) N=60
Index of "contentious" participation	0.506*** (0.140) N=60
Table displays coefficients δ with robust standard errors. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section J. Sensitivity of Results to Dropping Observations

Table 21 reports the effects of elections on collective action and public goods provision dropping each of the 13 clans that experienced a post-war change in leadership one-by-one. The effects of elections on community-level participation remain statistically insignificant in all instances, and the effects of elections on national-level participation remain statistically insignificant at the 90 percent confidence level in all but two cases. The effects of elections on contentious participation remains statistically significant at the 99 percent confidence level in all instances, and the effects of elections on public goods provision remains statistically significant at the 90 percent confidence level or higher in all but three instances.

Table 21. Sensitivity of Results to Dropping Clans with Change in Leadership One-By-One

	Community Index	National Index	Contentious Index	Public Goods Provision
1	0.261 (0.164)	0.295 (0.215)	0.471*** (0.140)	-16.7** (6.89)
2	0.200 (0.186)	0.435*** (0.141)	0.550*** (0.132)	-11.7 (7.21)
3	0.158 (0.189)	0.247 (0.213)	0.464*** (0.135)	-14.1* (7.74)
4	0.128 (0.189)	0.343* (0.201)	0.537*** (0.142)	-15.1** (7.46)
5	0.217 (0.182)	0.235 (0.239)	0.517*** (0.143)	-12.7* (7.58)
6	0.200 (0.194)	0.290 (0.217)	0.574*** (0.127)	-12.4 (7.61)
7	0.097 (0.185)	0.199 (0.228)	0.527*** (0.141)	-15.8** (7.37)
8	0.126 (0.186)	0.259 (0.215)	0.493*** (0.143)	-12.5* (7.42)
9	0.089	0.228	0.482***	-11.6

	(0.172)	(0.209)	(0.140)	(7.38)
10	0.078	0.232	0.467***	-13.9*
	(0.185)	(0.259)	(0.145)	(7.31)
11	0.170	0.270	0.514***	-15.0*
	(0.188)	(0.213)	(0.141)	(7.60)
12	0.204	0.236	0.458***	-15.5**
	(0.187)	(0.237)	(0.137)	(7.48)
13	0.167	0.225	0.510***	-13.2*
	(0.196)	(0.211)	(0.147)	(7.74)

Section K. Effects of Elections on All Outcomes in Participation Module

Our survey contained questions about whether respondents had participated in 14 different types of activities in the previous year. We subsequently used the nine measures we felt best captured clan-level participation, national-level participation, and contentious participation in our indices, as explained in the paper. However, for reasons of transparency, we report the effects of clan chiefs on all 14 measures below.

Table 22. Effect of Elections on All Outcomes in Participation Module

Contact town chief	0.057
	(0.082)
	N=881
Contact clan chief	0.196***
	(0.069)
	N=867
Contact elders	0.170
	(0.118)
	N=826
Contact police/courts	0.140**
	(0.069)
	N=877
Contact party rep	0.006
	(0.058)
	N=873
Contact political representative	0.119
	(0.085)
	N=872
Call radio program	0.033
	(0.053)
	N=877
Attend peace festival	0.033
	(0.111)
	N=872

Attend community meetings	-0.043
	(0.069)
	N=886
Spoke at community meetings	0.040
	(0.085)
	N=867
Attend peaceful protest	0.136**
	(0.064)
	N=880
Participate in violent protest/riot	0.076**
	(0.031)
	N=875
Attend political rally	0.073
	(0.090)
	N=865
Participate in "vigilantism"	0.059
	(0.053)
	N=875
Table displays coefficients δ with standard errors clustered by clan in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section L. Adjustment of P-values for Multiple Comparisons

We test the effects of clan chief elections on four distinct types of participation in our analysis. The p-values reported in the paper reflect the probability of incorrectly rejecting the null hypothesis in each case. However, we may also be interested in knowing the probability of making at least one false rejection of the null across the testing of the four hypotheses (the family-wise error rate) or the expected proportion of false discoveries (the false discovery rate). Table 23 reports adjusted p-values for each of the four hypotheses using six different methods that take into account either the family-wise error rate or the false discovery rate. The adjusted p-values were calculated using the qqvalue command in Stata (Newson 2010). Even using the most-conservative adjustments for multiple comparisons, we can have great confidence in our finding that clan chief elections increase contentious collective action. However, after adjusting for the fact of multiple comparisons, there is somewhere between a one in ten and one in five chance of finding that clan chief elections depress contributions to public goods even if the null hypothesis of no effect is true. We conclude that it is very unlikely that clan chief elections have a large positive effect on public goods provision in this context, but we must be cautious in interpreting the negative effect we observe in the data.

Table 23. Adjusted p-values

Outcome		Family-Wise Error Rate				False Discovery Rate	
	Unadjusted	Bonferroni	Sidak	Holm	Holland	Simes	Yekutieli
Index of community participation	0.375	1.000	0.847	0.408	0.375	0.375	0.781
Index of national-level participation	0.204	0.816	0.599	0.408	0.366	0.272	0.567
Index of "contentious" participation	0.0002	0.0008	0.0008	0.0008	0.0008	0.0008	0.0017
Average amount contributed in public goods game	0.062	0.248	0.226	0.186	0.175	0.124	0.258

Section M. Effect of Elections on Trust

As described in the article, we have tested whether clan chief elections in Liberia decrease trust in neighbors. Our measure of trust in neighbors is whether the respondent indicated they would be willing to have their payment for the survey left with a neighbor. We estimated the effects of elections on trust using equation (2) from the main article. These results are presented in table 24 below. In fact, elections increase trust in neighbors (rather than decreasing it), although the effect is not statistically significant at conventional levels.

Table 24. Effects of Elections on Trust in Neighbors

Whether trust neighbor with payment for survey	0.121 (0.082) N=700
Table displays coefficient δ with standard errors clustered by clan in parentheses. *, ** and *** indicate significance at the 90, 95 and 99 percent confidence levels respectively.	

Section N. Sample Characteristics

In table 25, we compare the characteristics of our sample of 60 clans to the characteristics of non-metropolitan Liberia at the end of the civil war. In particular, we compare the infrastructure in villages falling within the sampled clans to villages across the country, drawing on data collected by the UN's Office for the Coordination of Humanitarian Affairs immediately after the civil war. We also compare the land quality and population densities (in 1990) of the clans in the sample and across Liberia as a whole, drawing on data from the Center for International Earth Science Information Network (CIESIN) and the Food and Agricultural Organization (FAO) respectively. We examine the proportion of clans that experienced violence during the civil war, as indicated by ACLED, and the proportion of clans that hosted peacekeeping missions.

Our sample of clans was designed to over-represent clans with peacekeeping bases, and as a result, the sample has higher exposure to peacekeeping bases and higher values on some characteristics used to determine peacekeeping base locations (i.e. accessible roads during the rainy season and experience of violence during the civil war). However, on other characteristics, the sample is fairly similar to non-metropolitan Liberia as a whole.

Table 25. Comparing Sample to non-metropolitan Liberia

	Mean sample	Mean all Liberia (excluding Monrovia)
Village-level outcomes		
Functioning school in village[1]	0.16	0.19
Functioning health clinic in village	0.04	0.03
Road accessible in rainy season with 4x4	0.52	0.45
Clan-level outcomes		
Land quality in clan (1-8 score)	5.0	4.6
Population density in clan (1990)	30.2	31.7
At least one violent event in clan during war	0.31	0.12
Peacekeeping base in clan	0.43	0.05

References

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White, Halbert. 1984. *Asymptotic Theory for Econometricians*. San Diego: Academic Press.

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[1] This statistic indicates the proportion of villages with functioning schools, not the average proportion of villages per clan with functioning schools as reported in table 4 in the main article, because the village-level data is not matched to clans outside of the sample.