The Effect of Sexual Violence on Negotiated Outcomes in Civil Conflict: Online Appendix

Summary statistics

The following table presents information about the variables used in Table 1 of the manuscript.

Table A1: Summary Statistics

Variable	Mean	Std. Dev.	Min.	Max.	N
Outcome	0.899	1.527	0	4	1045
Government SV Prevalence	0.508	0.75	0	3	1066
Rebel SV Prevalence	0.204	0.584	0	3	1067
Equal Abuse	0.049	0.215	0	1	1067
Weak Rebels	0.91	0.287	0	1	1063
Government External Support	0.597	0.491	0	1	1067
Rebel External Support	0.576	0.494	0	1	1067
Battle Deaths	5.204	1.549	3.219	10.33	984
Government OSV	1.703	2.474	0	13.122	1067
Rebel OSV	1.301	2.188	0	10.313	1067
Peacekeepers	0.225	0.418	0	1	1067
Government Military Size	4.93	1.498	0	8.215	933
Level of Democracy	1.553	6.213	-9	10	1030
Population	10.496	1.684	5.927	13.961	1057
GDP Per Capita	7.47	0.979	5.384	10.353	1012

Competing risks models across all conflict outcomes

While the manuscript highlights only the models with negotiated outcomes, we present in the following tables these model specifications using the full range of potential forms of conflict termination. Many of the covariates have different effects (positive and negative) across the four conflict outcomes, although the effect is not always differentiable from zero. For example, though, as the government perpetrates higher levels of sexual violence, the conflict is less likely to result in military victory for either side (though only statistically significant for government victory) but negotiated settlements are more likely - and a stalemate/low activity outcome is also positively signed but not significant at conventional levels.

Table A2: Prevalence of Sexual Violence (Model 4)

	Model 6 Gov't Victory	Model 7 Rebel Victory	Model 8 Negotiated	Model 9 Low Activity
Government *SV Prevalence*	-0.978* (0.543)	-0.663 (0.664)	0.342 * (0.184)	0.139 (0.153)
Rebel *SV Prevalence*	0.276 (0.812)	-0.072 (0.417)	0.160 (0.190)	-0.261 (0.296)
Weak Rebels	16.461*** (0.602)	-1.940*** (0.664)	-0.299 (0.440)	0.586 (0.514)
Government *External Support*	-0.597 (0.445)	-0.764 (0.595)	0.085 (0.257)	0.185 (0.200)
Rebel *External Support*	-1.653** (0.649)	0.717 (0.807)	0.189 (0.247)	0.056 (0.200)
Battle Deaths	0.118 (0.170)	0.378* (0.203)	-0.057 (0.113)	-0.283*** (0.088)
Government OSV	0.056 (0.119)	0.169 (0.119)	-0.041 (0.052)	-0.033 (0.044)
Rebel OSV	-0.325 (0.258)	-0.083 (0.117)	0.054 (0.070)	-0.018 (0.072)
Peacekeepers	-0.545 (0.745)	-0.276 (1.120)	0.199 (0.362)	-0.162 (0.292)
Government *Military Size*	-0.651** (0.282)	-0.270 (0.325)	-0.283* (0.164)	0.449*** (0.147)
Democracy	-0.109** (0.048)	0.027 (0.048)	0.053 * (0.030)	-0.023 (0.024)
Population	0.324 (0.292)	-0.526 (0.387)	-0.033 (0.170)	-0.124 (0.110)
GDP Per Capita	0.635** (0.258)	-0.687 (0.552)	0.117 (0.187)	-0.263* (0.144)
N	797	797	797	797
Failures	23	13	75	115

Conflict episode dyad-years, 1989-2008. N=797, $N_{Conflicts}$=286.
Results of a competing risks regression, coefficients with p-values in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

Table A3: Equal Perpetration of Sexual Violence (Model 5)

	Model 10 Gov't Victory	Model 11 Rebel Victory	Model 12 Negotiated	Model 13 Low Activity
Government *SV Prevalence*	-0.941* (0.505)	-0.674 (0.786)	0.333* (0.189)	0.143 (0.149)
Rebel *SV Prevalence*	0.438 (0.623)	-0.082 (0.463)	0.071 (0.210)	-0.100 (0.290)
Equal Abuse	-14.669*** (0.984)	0.092 (1.301)	0.874** (0.425)	-0.829 (0.886)
Weak Rebels	15.210*** (0.600)	-1.951*** (0.709)	-0.315 (0.425)	0.587 (0.516)
Government *External Support*	-0.581 (0.443)	-0.759 (0.572)	0.107 (0.255)	0.192 (0.199)
Rebel *External Support*	-1.625** (0.632)	0.712 (0.821)	0.182 (0.245)	0.058 (0.199)
Battle Deaths	0.110 (0.164)	0.377* (0.199)	-0.078 (0.116)	-0.288*** (0.089)
Government OSV	0.074 (0.118)	0.169 (0.120)	-0.046 (0.051)	-0.030 (0.044)
Rebel OSV	-0.310 (0.244)	-0.084 (0.121)	0.052 (0.070)	-0.022 (0.073)
Peacekeepers	-0.656 (0.776)	-0.277 (1.133)	0.175 (0.358)	-0.178 (0.292)
Government *Military Size*	-0.695** (0.294)	-0.266 (0.324)	-0.326** (0.163)	0.463*** (0.147)
Democracy	-0.109** (0.046)	0.028 (0.046)	0.050* (0.028)	-0.024 (0.024)
Population	0.359 (0.302)	-0.526 (0.388)	0.013 (0.166)	-0.128 (0.110)
GDP Per Capita	0.635** (0.256)	-0.689 (0.549)	0.152 (0.183)	-0.265* (0.144)
N	797	797	797	797
Failures	23	13	75	115

Conflict episode dyad-years, 1989-2008. N=797, $N_{Conflicts}$=286.
Results of a competing risks regression, coefficients with p-values in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

Additional tests

We conducted a number of additional competing risks regressions in an effort to further unpack relationships between dynamics of sexual violence and civil conflict outcomes. Table A4 considers what is likely to happen when combatants alter (either increase or decrease) their perpetration of wartime sexual abuse; because measuring change over time requires that a conflict last for more than one year, we lose several observations where conflicts terminated within 365 days. The new variables *Government Increase* and *Rebel Increase* are binary indicators coded 1 if the perpetration variable is higher than it was in the previous year and 0 if it stayed the same or decreased, and similarly *Government Decrease* and *Rebel Decrease* are coded 1 if the perpetration variable is lower than it was in the previous year and 0 otherwise. We see that changes in the level of abuse perpetrated by government forces does not impact the time it takes to achieve a negotiated outcome (though the overall level of abuse does hasten settlement as it increases, and makes government victory less likely), but deescalation of sexual violence by rebels also increases the propensity for the combatant sides to successfully terminate the conflict via negotiations. This might be the result of rebels making an effort to be seen as "reasonable" members of government in a post-conflict situation that has them sharing power with the incumbent regime following a negotiated outcome. However, we are also more likely to observe government victory when rebels deescalate their perpetration of sexual violence – and this is not an outcome likely to produce post-conflict political participation by former rebels. Perhaps these situations of declining rebel abuse resulting in government victory are situations where the rebels' organizational strength in general is impeded (via desertion, for example) by the decrease in "rewards" from sexual violence, perhaps as a result of the group's desire to be more palatable to civilians in the event of a settlement, but the government takes advantage of the situation in order to exact defeat on its opponent.

In Table A5, we assess whether certain types of rebel groups are better able to force governments to come to the table. In particular, we might anticipate that rebels with external support are particularly effective at punishing governments via civilian abuse because they do not depend on winning hearts and minds of civilians and therefore can perpetrate more sexual violence without suffering negative consequences of impaired local support. To test this, we interact *Rebel SV Prevalence* with *Rebel External Support.* Here, we see that when engaging in sexual violence, rebels with external supporters and/or bases – those groups that might be less reliant on the hearts and minds of locals for support and success – are increasingly likely to achieve negotiated settlements with their adversarial government, or achieve outright victory. Conversely, in these cases governments are much less likely to achieve victory. This suggests that rebels with external sources of support are uniquely able to inflict pressure on the government through the sexual abuse of civilians, and as a result the government must either agree to concessions and settle the conflict (in line with existing literature on civilian killing and terrorism), or risk defeat. Thus, it appears that rebels are indeed able to use sexual violence in ways similar to lethal civilian abuse, but only in certain circumstances.

Finally, Table A6 explores whether the social costs of employing sexual violence is particularly costly in societies that have higher levels of gender equality. Here we split the sample of dyad-years by countries that had "low" versus "high" respect for women's political rights,

as defined and coded by the CIRI database (Cingranelli, Richards, and Clay 2014). The CIRI codebook (p. 71) defines women's political rights as including the right to vote, run for political office, hold elected and appointed government positions, join political parties, and petition government officials. We consider countries as being "low" in this regard if CIRI codes them as a 0 or 1, meaning that women's political rights may or may not guaranteed by law, and women are either prevented from participating in politics or they hold less than five percent of seats in the legislature and other major government positions. Conversely, we treat countries as having "high" respect for women's political rights if they both guarantee political equality by law and women hold more than five percent of government positions (in other words, CIRI codes the country in a given year as a 2 or 3). There are not sufficient observations of rebel victories across the two samples to run our analyses on this outcome, but in situations of legal protections and higher women's political participation (CIRI women's political rights = 2 or 3) we are more likely to see negotiated settlements when rebels engage in sexual violence during civil wars. When civilians are being abused by rebels, in particular, victims and their supporters are better able to pressure the combatants to agree to end the conflict when women have some modicum of political representation and legal protection. Using the Liberian example from the manuscript, in the early 2000s the country saw a CIRI coding of 2 for women's political rights, and having increased women's representation in government may well have helped victims of wartime sexual abuse and their supporters to mobilize successfully in support of a settlement.

Table A4: Changes in Level of Sexual Violence

	Model 14 Gov't Victory	Model 15 Negotiated	Model 16 Low Activity
Government *SV Prevalence*	-1.405*** (0.507)	0.517** (0.246)	0.324 (0.239)
Government *SV Increase*	0.939 (0.592)	0.314 (0.491)	-0.208 (0.474)
Government *SV Decrease*	-17.121*** (0.875)	0.034 (0.429)	-0.214 (0.496)
Rebel *SV Prevalence*	-15.363*** (2.070)	0.387 (0.281)	0.237 (0.463)
Rebel *SV Increase*	1.770 (1.815)	-0.328 (0.674)	0.130 (0.922)
Rebel *SV Decrease*	2.207** (1.093)	1.334*** (0.451)	-1.220 (0.994)
Weak Rebels	17.035*** (2.024)	0.396 (0.513)	0.404 (0.721)
Government *External Support*	0.816 (1.289)	0.162 (0.421)	-0.108 (0.326)
Rebel *External Support*	-2.542** (1.216)	0.221 (0.354)	0.189 (0.361)
Battle Deaths	-0.064 (0.215)	-0.337** (0.168)	-0.287** (0.111)
Government OSV	-0.097 (0.271)	-0.079 (0.054)	-0.033 (0.064)
Rebel OSV	-0.101 (0.369)	-0.008 (0.091)	-0.146 (0.093)
Peacekeepers	-15.722*** (0.892)	0.747* (0.452)	0.055 (0.460)
Government *Military Size*	-0.427 (1.329)	-0.223 (0.191)	0.128 (0.243)
Democracy	-0.146 (0.109)	0.071* (0.039)	-0.031 (0.030)
Population	0.463 (1.096)	-0.245 (0.183)	0.027 (0.165)
GDP Per Capita	0.247 (0.872)	-0.056 (0.253)	-0.141 (0.223)
N	534	534	534
Failures	6	48	59

Conflict episode dyad-years, 1989-2008. N=534, $N_{Conflicts}$=157.
Not enough rebel victories in the sample for that outcome to be modeled.
Results of a competing risks regression, coefficients with p-values in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

Table A5: Interaction, Rebel SV Prevalence & Rebel External Support

	Model 17 Gov't Victory	Model 18 Rebel Victory	Model 19 Negotiated	Model 20 Low Activity
Government	-0.983*	-0.767	0.293	0.146
SV Prevalence	(0.557)	(0.611)	(0.185)	(0.150)
Rebel	0.505	-14.906***	-0.301	0.073
SV Prevalence	(0.698)	(1.081)	(0.277)	(0.501)
Rebel SV Prev *	-14.013***	15.007***	0.705**	-0.501
External Support	(0.982)	(0.968)	(0.327)	(0.605)
Weak Rebels	15.744***	-1.921***	-0.294	0.574
	(0.585)	(0.649)	(0.426)	(0.520)
Government	-0.611	-0.761	0.128	0.181
External Support	(0.434)	(0.592)	(0.260)	(0.200)
Rebel	-1.495**	0.447	-0.010	0.093
External Support	(0.650)	(0.863)	(0.274)	(0.199)
Battle Deaths	0.123	0.398**	-0.053	-0.288***
	(0.159)	(0.196)	(0.116)	(0.088)
Government OSV	0.058	0.177	-0.042	-0.031
	(0.116)	(0.115)	(0.052)	(0.044)
Rebel OSV	-0.263	-0.064	0.041	-0.009
	(0.254)	(0.118)	(0.069)	(0.075)
Peacekeepers	-0.696	0.039	0.325	-0.184
	(0.839)	(1.035)	(0.357)	(0.288)
Government	-0.656**	-0.265	-0.288*	0.455***
Military Size	(0.279)	(0.321)	(0.166)	(0.146)
Democracy	-0.110**	0.030	0.050*	-0.024
	(0.047)	(0.045)	(0.030)	(0.024)
Population	0.334	-0.560	-0.042	-0.120
	(0.291)	(0.378)	(0.171)	(0.109)
GDP Per Capita	0.630**	-0.701	0.136	-0.262*
	(0.255)	(0.567)	(0.191)	(0.144)
N	797	797	797	797
Failures	23	13	75	115

Conflict episode dyad-years, 1989-2008. N=797, $N_{Conflicts}$=286.
Results of a competing risks regression, coefficients with p-values in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$

Table A6: Split Sample, Women's Political Rights (Low = Models 21-23, High = 24-26)

	Model 21 G Victory	Model 22 Negotiated	Model 23 Low Activity	Model 24 G Victory	Model 25 Negotiated	Model 26 Low Activity
Government	-1.223*	0.059	-0.032	-1.175	0.134	0.074
SV Prevalence	(0.629)	(0.492)	(0.457)	(0.919)	(0.221)	(0.191)
Rebel	-12.376***	-0.401	-0.168	-15.465***	0.516*	-0.393
SV Prevalence	(1.117)	(0.521)	(0.922)	(0.787)	(0.271)	(0.352)
Weak Rebels	16.097***	-0.258	16.185***	18.745***	0.105	0.168
	(1.722)	(1.434)	(2.689)	(0.850)	(0.732)	(0.838)
Government	-1.049	0.885	0.176	-0.716	0.292	0.273
External Support	(1.024)	(0.915)	(0.415)	(0.660)	(0.338)	(0.273)
Rebel	-2.232**	-1.169	0.613	-1.117	0.064	0.054
External Support	(1.032)	(1.249)	(0.682)	(0.706)	(0.302)	(0.236)
Battle Deaths	0.334	0.371	-0.241	0.204	-0.077	-0.387***
	(0.290)	(0.288)	(0.161)	(0.257)	(0.148)	(0.140)
Government OSV	0.208	0.010	-0.164	-0.073	0.026	0.008
	(0.152)	(0.076)	(0.130)	(0.231)	(0.068)	(0.060)
Rebel OSV	-3.488***	0.250	-0.086	-0.181	0.027	-0.007
	(0.355)	(0.200)	(0.309)	(0.301)	(0.101)	(0.084)
Peacekeepers	0.308	0.121	2.694***	-15.293***	0.519	-0.390
	(1.678)	(1.373)	(0.561)	(0.686)	(0.429)	(0.372)
Government	-0.496	-0.908**	0.981*	-0.977**	-0.409**	0.468***
Military Size	(0.433)	(0.444)	(0.580)	(0.484)	(0.190)	(0.175)
Democracy	0.012	0.037	0.052	-0.129**	0.009	-0.028
	(0.061)	(0.058)	(0.057)	(0.057)	(0.040)	(0.029)
Population	0.021	1.292**	-0.001	0.315	0.092	-0.119
	(0.572)	(0.511)	(0.413)	(0.355)	(0.171)	(0.130)
GDP Per Capita	0.997**	-0.556	-1.030**	0.904**	0.342	-0.344*
	(0.452)	(0.521)	(0.406)	(0.385)	(0.224)	(0.190)
N	175	175	175	563	563	563
Failures	11	11	35	10	55	76

Conflict episode dyad-years, 1989-2008. N=797, $N_{Conflicts}$=286.
Not enough rebel victories in the samples for that outcome to be modeled.
Results of a competing risks regression, coefficients with p-values in parentheses.
*$p < 0.10$, **$p < 0.05$, ***$p < 0.01$