Risk Mitigation, Regime Security, and Militias: Beyond Coup-Proofing

Supplementary File

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In this supplementary file we present further predictions and explore additional tests of the connection between coups, civil war risk, accountability avoidance, and the presence of pro-government militias. We argued in the main paper that based on pre-existing research, semi-official militias that are outside of the regular military chain-of-command but with a visible link to the government will be most likely to be used for coup-proofing. However, it is possible that governments may also utilize irregular militias to coup-proof that are not obviously tied to the government. These more informal militias are also coded in our underlying data. Therefore, we re-analyze six models from the main paper using a new indicator that includes both semi-official and informal militia linkages in a state as the dependent variable. These results can be found in Table A1 and A2.

The inferences from these models remain consistent with our conclusions in the text. Coup risk in isolation (Model 2.1 and Model 2.2) aids in predicting the presence of militias, but there is room for improvement. The addition of civil war risk and accountability avoidance

indicators (Models 2.3 and 2.4) provide a meaningful boost in predictive capacity for the model both in-sample and out-of sample. Table A2 illustrates that the disaggregated model also continues to be the preferred model when compared to the others as we present in the main text. The same development puzzle highlighted in the main text continues to exist in these data.

We also investigated whether dropping states that only had informal militias from our sample altered our results. Since this changes our sample we can no longer compare AIC values. However, the inferences from the coefficients in Table A3 are again consistent.

In Figure A1 we analyze what observations are both predicted and surprising given our best-fitting out-of-sample model (Model 4.1 in the main paper). This figure plots the out-of-sample predicted probabilities of a militia being present in a given country in a particular year on the x-axis, and the actual observed measure on the y-axis. We plot the text of the three-letter country codes and the year of the observation to aid in identification.[1] The size of the text is proportional to the absolute value of the difference between the actual observation and our prediction from the model with the disaggregated indicators (Model 4.1) to allow us to see which observations are clear misses and which ones are more accurate.[2] In the upper-right hand corner, the model predicts cases of militia presence well in India, Iraq, Uganda, China, and the Philippines. It also comes close for Libya, Saudi Arabia and Rwanda. The largest errors that would lead to false negatives in the forecast appear to be in Russia and Estonia. Similarly, in the bottom row, the model accurately predicts the absence of semi-official militias in Gambia, Togo, Kuwait, Greece, and Lebanon, among others. However, the model predicts a high probability of seeing militias in Colombia and Nigeria in 2005 and Ghana in 2002, when these groups were measured as being absent. Although no semi-official militias have been coded for these countries during these years, both Colombia and Nigeria had informal militias in 2005, which lack the official and recognized status of semi-official militias. While informal militias are often associated with governments that have an incentive to avoid accountability and need low-cost armed groups that can be mobilized quickly (e.g., Alvarez 2006), we would not expect these groups to be used for coup-proofing.

[1] These values are jittered slightly to improve readability.

[2] The small text is needed for the accurate predictions since the model performs quite well and thus there are many predictions clustered near zero when militias were observed to be absent, and near one when militias were observed to be present.

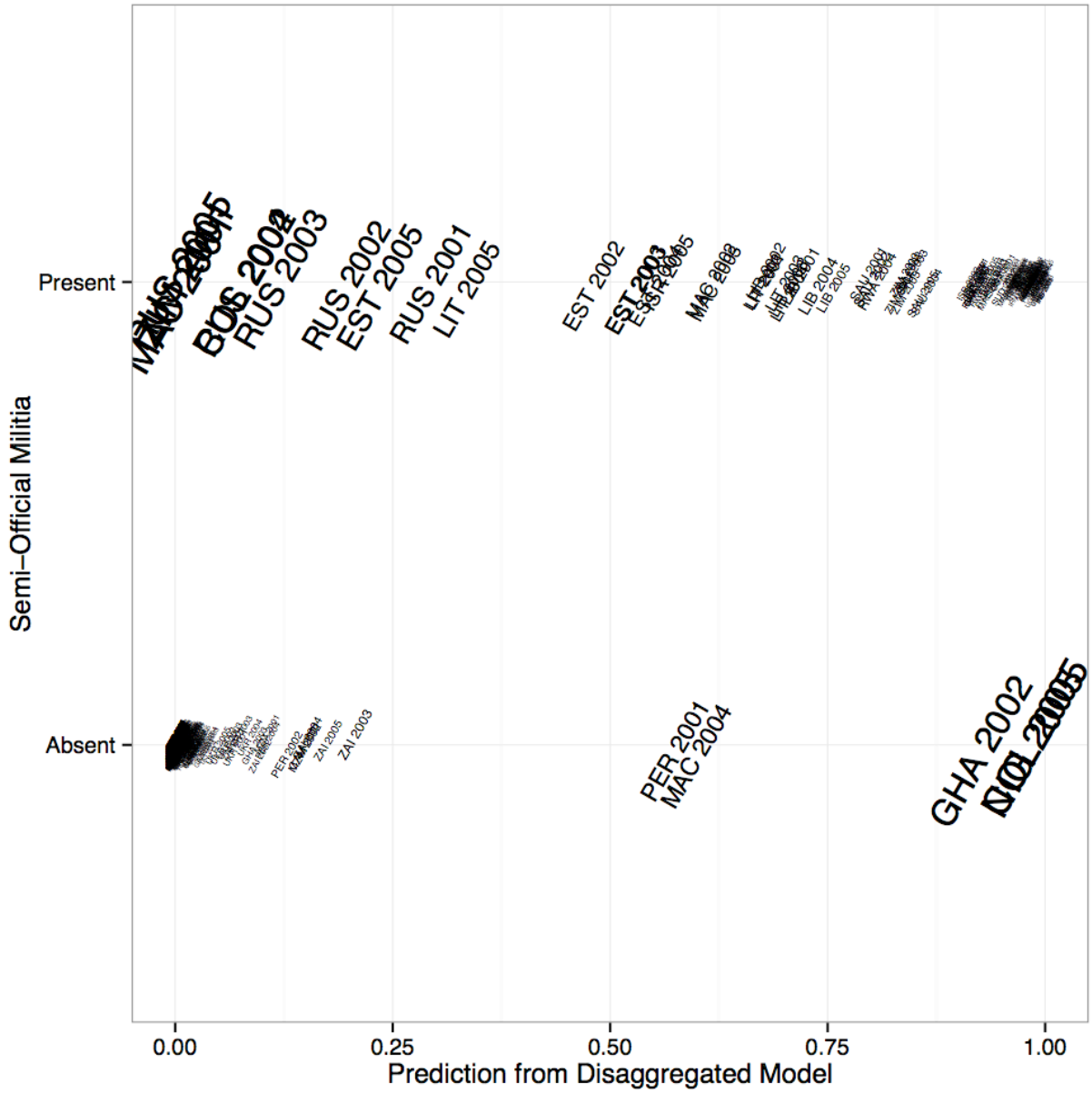

FIG A1: Plot of the out-of-sample predicted probabilities from the disaggregated model (4.1) and the actual values. The size of the three-letter country code and year labels is proportional to the absolute distance between the predicted and observed values.

TABLE A1. Analysis of observing either semi-official or informal militias

	All PGMs		*All PGMs*		*All PGMs*		*All PGMs*		*All PGMs*		*All PGMs*	
	Model 2.1		*Model 2.2*		*Model 2.3*		*Model 2.4*		*Model 3.1*		*Model 3.2*	
Variables	*Coef*	*(SE)*	*Coef*	*(SE)*	*Coef*	*(SE)*	*Coef*	*(SE)*	*Coef*	*(SE)*	*Coef*	*(SE)*
Intercept	-0.715	(0.045)	-0.921	(0.049)	-1.028	(0.054)	-1.143	(0.059)	-2.133	(0.136)	-2.108	(0.140)
Coup Risk (B+S)	0.208	(0.022)			0.051	(0.028)			-0.052	(0.052)		
Recent Coup			0.726	(0.112)			0.505	(0.124)			-0.064	(0.228)
Civil War Risk					0.331	(0.018)	0.335	(0.018)	0.267	(0.030)	0.264	(0.030)
Account. Avoidance					0.172	(0.045)	0.181	(0.044)	0.428	(0.083)	0.412	(0.081)
Time since last PGM obs.									650.3 (8.7)		650 (8.7)	
AIC	2960.4		3011.1		2476.2		2463.2		890.7		891.7	
In-sample AUC	0.55		0.53		0.75		0.75		0.92		0.92	
Out-of-Sample AUC			0.55				0.82				0.97	
Out-of-Sample Brier Score			0.20				0.14				0.03	
N	2456		2456		2456		2456		2456		2456	

Note. Out-of-sample prediction done with 684 observations from 2001 – 2005. Lower AIC and Brier score are preferred. Higher AUC is preferred. Generalized Additive models using logit link function estimated with mgcv in R. Chi-squared test and degrees of freedom (in parentheses) are reported for the splines measuring the nonlinear effect of the time since the last PGM observation.

TABLE A2. Analysis of either semi-official or informal militias with disaggregated measures

		Model 4.1	
Concept	*Variable*	*Coef.*	*(SE)*
Constant	Intercept	-11.997	(1.493)
Coup	Recent Coup	0.195	(0.257)
Civil War	Mixed Regime	0.669	(0.221)
	Development	0.311	(0.153)
	Population	0.630	(0.086)
	Non-contiguous Terr.	-0.083	(0.204)
	Ethnic Frac.	0.175	(0.391)
	Mount. Terrain	0.013	(0.077)
	Recent Civil War	1.489	(0.308)
Accountability Avoidance	Aid from Democracies	0.180	(0.035)
	Aid from Autocracies	-0.130	(0.032)
Timing	Time since last PGM observation	570.8 (8.6)	
	AIC	839.0	
	In-sample AUC	0.94	
	Out-of-Sample AUC	0.97	
	Out-of-Sample Brier Score	0.03	
	N	2456	

Note: Out-of-sample prediction done with 684 observations from 2001-2005. Lower AIC and Brier score are preferred. Higher AUC is preferred. Generalized Additive models using logit link function estimated with mgcv in R. Chi-squared test and degrees of freedom (in parentheses) are reported for the splines measuring the nonlinear effect of the time since the last PGM observation. Concept column refers to the indicators from the previous models.

TABLE A3. Analysis of semi-official militias, excluding observations with only informal militias

	Model 4	
	Combined Risk	
Variables	*Coef*	*(SE)*
Intercept	-3.495	(0.216)
Coup Risk (B+S)	-0.060	(0.060)
Civil War Risk	0.216	(0.037)
Account. Avoidance	0.366	(0.098)
AIC	601.8	
N	2031	

Note. Chi-squared test and degrees of freedom (in parentheses) are reported for the splines measuring the nonlinear effect of the time since the previous PGM observation.

In Table A4 we explore whether the process by which semi-official militias are created changed after the end of the Cold War. The inclusion of a dummy variable marking the post-1989 time period was inconsistent. Regardless of the inclusion of this variable our results were consistent. Testing for a structural break in accountability avoidance after the Cold War yielded a lower AIC value and an insignificant F-statistic (.57, p-value=.45).

TABLE A4. Analyzing the Impact of the Cold War

	Model 5.1		*Model 5.2*	
Variables	*Coef.*	*(SE)*	*Coef.*	*(SE)*
Intercept	-1.18	(0.08)	-1.31	(0.09)
Coup Risk (B+S)	0.14	(0.02)	-0.02	(0.03)
Civil War Risk			0.28	(0.02)
Account. Avoidance			0.18	(0.05)
Post Cold War	-0.05	(0.10)	-0.38	(0.11)
AIC	2567.5		2248.9	
N	2456		2456	

Next, while we created indicators of civil war risk explicitly to avoid the possibility that the creation of militias would, within a given year, make civil war more likely, and thus induce bias in our estimates, it is important to check the robustness of our assumption. One way to explore this is to recreate our index without the recent civil war measure. This indicator is the most likely component to be correlated with sub-annual changes in both militias and civil wars. However, we should point out that the assumption that militias make civil wars independently more likely within a given year relies on the assumption that leaders either do not know this, or want to bring about their own demise, which we find unlikely. Regardless, we believe checking the robustness of our civil war risk indicator to this change is useful. Table A5 is thus reassuring. In all cases, the use of a civil war index that does not include previous civil wars as an indicator leads to the identical inferences as those reported in the main text.

TABLE A5. Dropping recent civil war from civil war risk measure

	Model 6.1		*Model 6.2*		*Model 6.3*		*Model 6.3*	
Variables	*Coef.*	*(SE)*	*Coef.*	*(SE)*	*Coef.*	*(SE)*	*Coef.*	*(SE)*
Intercept	-1.44	(0.06)	-1.49	(0.06)	-3.12	(0.17)	-2.12	(0.14)
Coup Risk (B+S)	0.03	(0.03)			-0.07	(0.06)		
Recent Coup			0.20	(0.13)			-0.06	(0.23)
Modified Civil War Risk	0.24	(0.02)	0.24	(0.02)	0.23	(0.04)	0.26	(0.03)
Account. Avoidance	0.20	(0.05)	0.121	(0.05)	0.43	(0.09)	0.45	(0.08)
Time since last PGM observation					7.46	(8.40)	8.05	(8.74)
AIC	2367.2		2365.7		786.23		911.29	
N	2456		2456		2456		2456	

Note. Chi-squared test and degrees of freedom (in parentheses) are reported for the splines measuring the nonlinear effect of the time since the previous PGM observation.

To probe whether our variables are simply measuring either time-constant regional variation in militia propensity or episodic cross-sectional shocks in a given year, as opposed to our indicators of interest, we ran models with regional and then yearly fixed effects. Nine regions were coded based on the Correlates of War definitions.[3] These results are included in Table A6.

TABLE A6. Including regional and yearly fixed effects

	Model 7.1		*Model 7.2*	
	Regional fixed effects		*Yearly fixed effects*	
Variables	*Coef.*	*(SE)*	*Coef.*	*(SE)*
Intercept	-2.86	(0.20)	-1.43	(0.25)
Coup Risk (B+S)	0.03	(0.04)	-0.03	(0.03)
Civil War Risk	0.29	(0.02)	0.28	(0.02)
Account. Avoidance	0.22	(0.05)	0.18	(0.05)
AIC	1995.1		2273.7	
N	2456		2456	

[3] The assignment of states to regions can be found here: http://www.correlatesofwar.org/COW2%20Data/MIDs/Development/regions.htm.

Finally, we re-estimate our Model 3.3 from Table 3 the main text, but using lagged values of each index. We find the same substantive results, shown in Table A7.

TABLE A7. Using lagged indices

	Model 8.1	
Variables	*Coef.*	*(SE)*
Intercept	-2.77	(0.14)
Coup Risk $(B+S)_{t-1}$	-0.06	(0.05)
Civil War Risk $_{t-1}$	0.24	(0.03)
Account. Avoidance $_{t-1}$	0.21	(0.08)
AIC	909.9	
N	2455	