Replication of a Research Claim from Weidmann and Callen (2013), from *British Journal of Political Science*

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Project ID: Weidmann_BritJournPoliSci_2013_JRpA_Sevigny_DirectReplication_mk67

OSF project: https://osf.io/xtq68/

Preregistration: https://osf.io/4mh7c

Background: Violence and insecurity has consistently been found to increase election fraud in developing countries. Weidmann and Callen (2013) hypothesized that this positive association will hold up to a point, whereupon more severe levels of violence will serve to undermine the effectiveness of organized fraudulent networks. Weidmann and Callen (2013) analyzed data from the 2009 Afghanistan presidential election and found supporting evidence for this inverted U-shaped hypothesis. The current project replicates their study by analyzing data on the 2014 Afghanistan presidential election.

Claim Summary: The claim selected for replication from Weidmann and Callen (2013) is that the relationship between (in)security and election fraud should be in the form of an inverted U-shape. Fraud increases with violence up to a certain level, but then decreases again. This reflects the following statement from the paper's abstract: "It predicts (i) that the relationship between violence and fraud follows an inverted U-shape and (ii) that loyalty networks of both incumbent and challenger react differently to the security situation on the ground. Disaggregated violence and election results data from the 2009 Afghanistan presidential election provide empirical results consistent with this theory." The claim is tested with the logit models presented in Table 2. The dependent variable is a binary measure of fraud, calculated by grouping polling stations by district and applying the Beber–Scacco last-digit test to the total vote count (Beber & Scacco, 2012). The dependent variable takes the value of 1 if this test is significant at the 5 percent level for a particular district. The authors measure violence as the number of attacks per capita against the International Security Assistance Force (ISAF). In Model 1 (the model selected as evidence for the SCORE program from Table 2), it is included in both linear and squared form. In conjunction with a

positive and significant coefficient for the linear term, the claim is tested with the coefficient on the squared term.

Replication Criteria: The hypotheses tested for this replication include the following:

H1: The linear association between violence and election fraud will be positive.

H* (SCORE focal test): The quadratic association between violence and election fraud will be negative.

The SCORE focal test references the quadratic term in the original model (Table 2, Model 1). The alternative hypothesis (H1) references the linear term in the same model, which is consistent with the original hypothesis specified by Weidmann and Callen (2013:58): "The relationship between (in)security and election fraud should be in the form of an inverted U-shape. Fraud increases with violence up to a certain level, but then decreases again." Testing the combination of H1 and H* will more fully assess this broader claim posed in the original study. The criteria for a successful replication attempt is a statistically significant effect ($p < .05$, two tailed) in the same pattern as the original study on the focal hypothesis tests (H1 and H*). For this study, this criteria is met by a positive and significant coefficient on the linear term for election violence (H1) and a negative and significant coefficient on the squared term for election violence (H*) in the focal regression model.

Replication Result: We first present descriptive statistics for the variables included in the regression models in Table 1. Summary statistics (Mean [SD]) reported here are generally consistent with those reported in Table 1 in Weidmann and Callen (2013) for fraud (0.16 [0.37] vs. 0.18 [0.39]), election violence (0.03 [0.08] vs. 0.03 [0.08]), pre-election violence (0.24 [0.55]

vs. 0.23 [0.52]), distance from Kabul (276.73 [181.30] vs. 275.40 [180.93]), and elevation (1874.03 [916.51] vs. 1880.00 [921.85]). Key differences are observed for per-capita expenditures (1.57 [1.12] vs. 4.16 [2.38]), electrification (0.85 [0.20] vs. 0.31 [0.30]), and polling closures (8.30 [17.71] vs. 10.69 [19.78]). Note that, as explained below, the latter variable is operationalized differently here as 'Percentage of centers closed' versus 'Number of planned stations closed' in the original study. Note that the target analytic sample was the maximum possible analytic sample of N=800 (based on number of districts and election cycles); due to missing data on development control variables, the final analytic sample was N=724.

Replication results examining the effect of insurgent violence on election fraud are presented in Table 2. For Model 1, the significant positive effect of violence (b = 21.22 [SE = 5.05], p = 0.00003) and significant negative effect of violence squared (b = -92.44 [SE = 37.2], p = 0.0128) on fraud successfully replicates the results reported by Weidmann and Callen (2013) in Table 2, Model 1. These results are visualized in Figure 1, Panel 1. Similarly, for Model 2, the significant positive effect of violence (b = 2.63 [SE = 0.97], p = 6.269e-42) and significant negative effect of violence squared (b = -1.18 [SE = 0.46], p = 0.0000001) on fraud successfully replicates the results reported by Weidmann and Callen (2013) in Table 2, Model 2. These results are visualized in Figure 1, Panel 1. As a sensitivity analysis to one-way clustering, models 3 and 4 repeat these analyses with multiway clustering by regional command and election cycle. In both instances, the replication results are confirmed by these sensitivity analyses, with results visualized in Figure 1, Panels 3 and 4, respectively. To summarize, all analyses successfully replicated the SCORE claim (H*) and its associated alternative hypothesis (H1).

Deviations from the Original Study: We had one key measurement difference in the replication. Namely, our measure of 'Percentage of polling centers closed' differs from Weidmann and Callen's (2013) analogous measure of 'Number of closed polling stations.' We deviate from their measure for two reasons. First, data on the number of planned polling stations is unreliably measured; we have more confidence in data on planned polling centers. Second, normalizing by the number of planned centers adjusts for underlying district population differences as reflected by number of polling centers. Weidmann and Callen (2013) did not normalize polling station counts because each station is limited to collecting 600 ballots, so normalization was inherent in the measure. This is not the case with polling centers, which can support variable numbers of polling stations. We therefore normalize the measure as a percentage to make the measure meaningful in context. Analytically, while the main replication Models 1 and 2 were estimated similarly to the original, we estimated Models 3 and 4 to account for multiway clustering to account for both regional command (same as original) and election cycle (unique to this replication due to combining data from the 2014 initial and runoff elections).

Deviations from Preregistration: The replication differs from the preregistration in minor ways. First, we had proposed to alter the scaling of two control variables (electrification, elevation) to aid interpretation of results, but we chose to keep the scaling the same as the original in the final analyses. Second, we revised the analytic script to export results in tabular and graphical form. This revised script is available on the OSF project page (Weidmann_Data_Analysis_Final.do).

Description of Materials Provided: The following materials are publicly available on the OSF project site (https://osf.io/xtq68/).

1. Preregistration document (Preregistration - Weidmann_BritJournPoliSci_2013_JRpA - Sevigny - Direct Replication - mk67.pdf)
2. Georgia State University IRB approval letter (Outcome_Letter.pdf)
3. Power analysis (POWER_Weidmann_BritJournPoliSci_2013_JRpA.zip)
4. Raw data in a .csv file (Afghanistan_Election_Violence_2014.csv)
5. Raw data in a Stata .dta file (Afghanistan_Election_Violence_2014.dta)
6. A codebook (Codebook_Afghanistan_Election_Violence_2014.pdf)
7. Data management script (Weidmann_Data_Cleaning .do), preregistered and final data analysis script (Weidmann_Data_Analysis.do, Weidmann_Data_Analysis_Final.do).
8. Log files reporting analyses on 5% random sample of data (Weidmann_Results_5_Percent.log) and final analyses on full analytic sample (Weidmann_Results_Final.log).

Bibliographic Citations

Beber, B., & Scacco, A. (2012). What the numbers say: A digit-based test for election fraud. *Political Analysis, 20*(2), 211-234.

Weidmann, N. B., & Callen, M. (2013). Violence and election fraud: Evidence from Afghanistan. *British Journal of Political Science, 43*, 53-75.

Data Citations

Bauer, Vincent. (2020). *Iraq and Afghanistan SIGACTS*. Available here: https://rdrr.io/github/knapply/data4ds4da/man/bauer-sigacts.html. Accessed: March 23, 2020.

Central Statistics Organization. (2016) *Afghanistan Living Conditions Survey 2013-14*. Available by request from: data.sharing@nsia.gov.af. Received: March 31, 2020.

Cookman, Colin. (2019). Afghanistan District Population Data. Available here: https://github.com/colincookman/afghanistan_district_population_data. Accessed: March 21, 2020.

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Table 1 Summary Statistics for the Variables Included in the Regression Analysis

Variable	Mean	SD	Min	Max	N
Fraud					
Fraud, last digit test	0.16	0.37	0.00	1.00	800
Percentage of polling centers closed	8.30	17.71	0.00	94.74	800
Violence					
Violence (election)	0.03	0.08	0.00	0.97	800
Violence (2 months, pre-election)	0.24	0.55	0.00	7.34	800
Development					
Per-capita expenditure (1000 AFs)	1.57	1.12	0.12	7.52	724
Electrification	0.85	0.20	0.00	1.00	724
Geography					
Distance from Kabul (km)	276.73	181.30	0.00	817.58	800
Elevation (m)	1874.03	916.51	263.60	4539.40	800

Table 2. Logit Regressions of Election Fraud on Violence

	Model 1	Model 2	Model 3	Model 4
Violence (election) **[H1]**	21.22		21.22	
	[5.047]		[1.564]	
	(0.0000262)		(6.269e-42)	
Violence (election squared) **[H*]**	-92.44		-92.44	
	[37.15]		[17.54]	
	(0.0128)		(0.000000136)	
Violence (2 months pre-election) **[H1]**		2.631		2.631
		[0.974]		[0.762]
		(0.00693)		(0.000559)
Violence (2 months pre-election, squared) **[H*]**		-1.180		-1.180
		[0.459]		[0.427]
		(0.0102)		(0.00576)
Percentage of polling centers closed	-0.00158	-0.00112	-0.00158	-0.00112
	[0.0113]	[0.0110]	[0.0259]	[0.0150]
	(0.889)	(0.919)	(0.951)	(0.941)
Electrification	1.539	1.484	1.539	1.484
	[0.401]	[0.446]	[0.475]	[0.263]
	(0.000122)	(0.000882)	(0.00120)	(1.60e-08)
Per-capita expenditure (1000 AFs)	-0.000679	-0.00863	-0.000679	-0.00863
	[0.0659]	[0.0480]	[0.0438]	[0.0428]
	(0.992)	(0.857)	(0.988)	(0.840)
Distance from Kabul (km)	-0.00000937	-0.0000800	-0. 00000937	-0.0000800
	[0.000363]	[0.000464]	[0.00244]	[0.00145]
	(0.979)	(0.863)	(0.997)	(0.956)
Elevation (m)	0.000414	0.000480	0.000414	0.000480
	[0.000136]	[0.000145]	[0.000344]	[0.000255]
	(0.00228)	(0.000938)	(0.229)	(0.0602)
Constant	-4.091	-4.201	-4.091	-4.201
	[0.668]	[0.632]	[0.207]	[0.299]
	(8.95e-10)	(2.92e-11)	(1.270e-86)	(9.293e-45)
McFadden's R^2	0.0621	0.0576	0.0621	0.0576
N	724	724	724	724

Coefficients reported in log-odds. SEs in brackets; SEs are clustered by regional command in models 1 and 3, and by regional command and election cycle in models 2 and 4. *p*-values in parentheses.

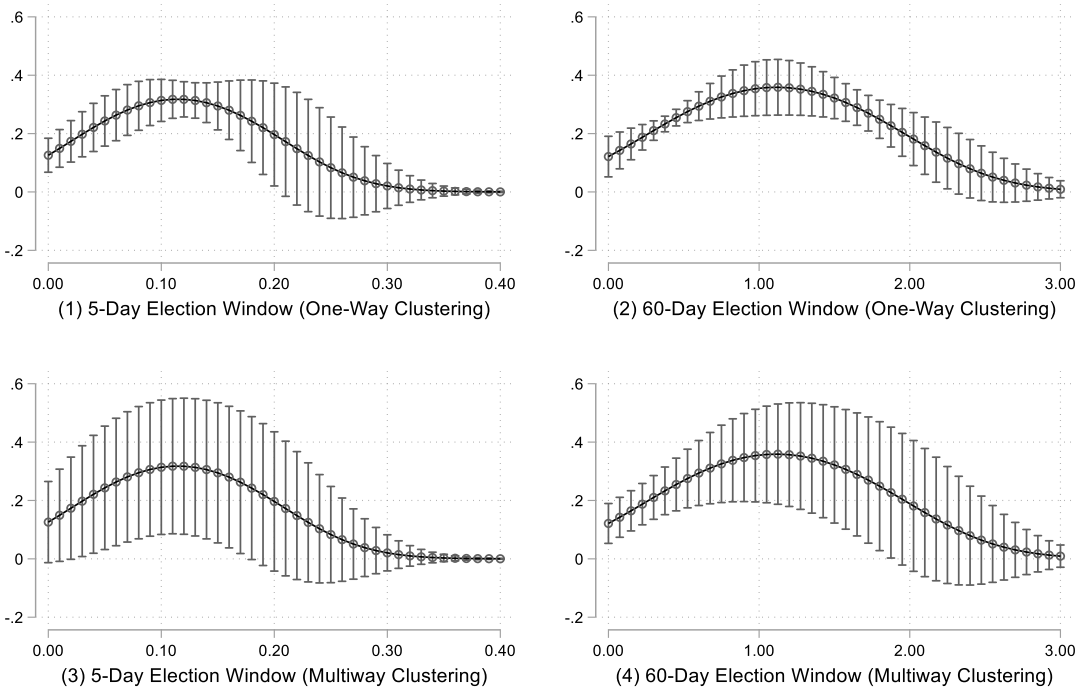

Figure 1 Predicted Probability of Election Fraud by Violence Rate