Appendix part 2

Cole J. Harvey (Oklahoma State University)

09 January, 2023

1 Predicted number of protest events for extreme values of election fraud

Figures 1, 2, and 3 illustrate the marginal effects of extreme values for election fraud on the expected number of post-election protests, based on Models 4 - 6 in the main text. They demonstrate that there is no significant relationship between the severity of fraud and the size of post-election protest waves for any of the moderator variables—incumbent vote-share, economic crisis, or public sector corruption.

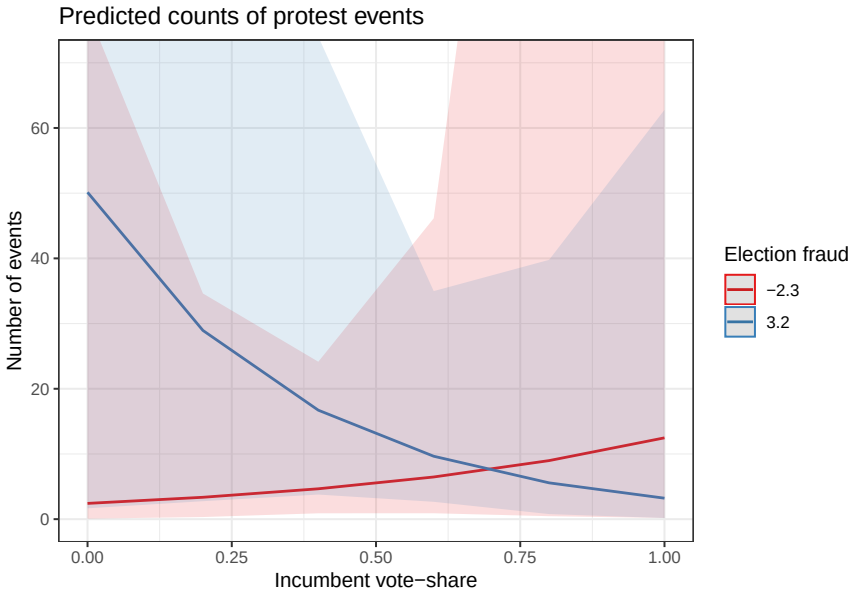

Figure 1: Fraud, incumbent vote-share, and number of protest events

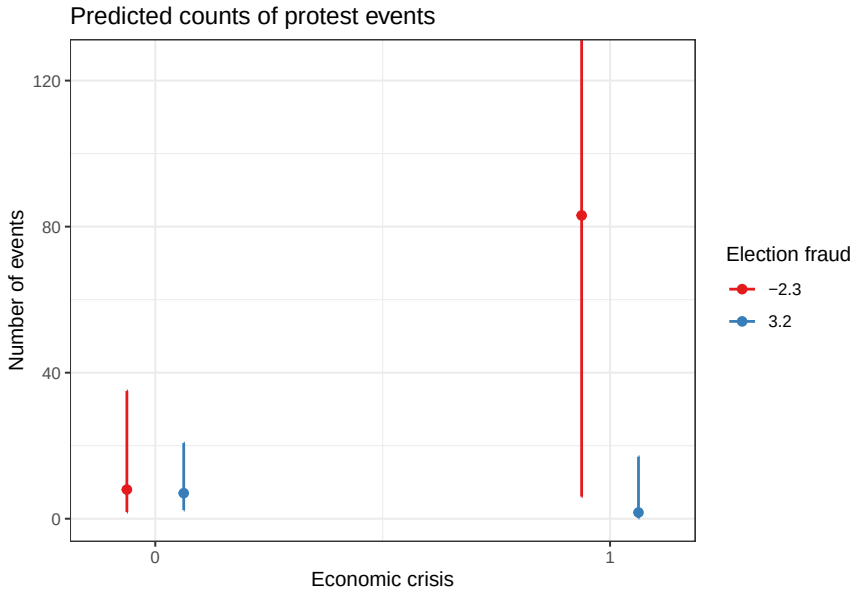

Figure 2: Fraud, economic crisis, and number of protest events

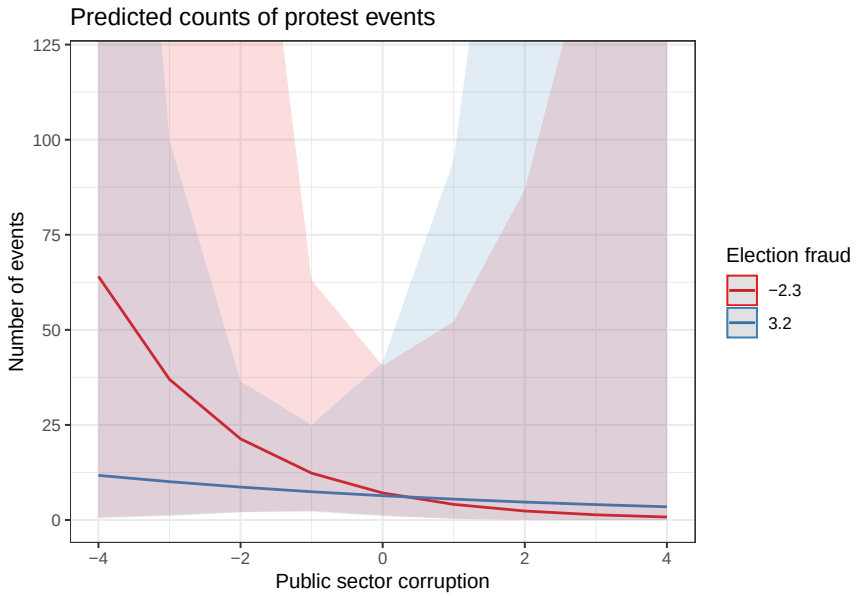

Figure 3: Fraud, public sector corruption, and number of protest events

2 Alternative measures of election manipulation

To ensure that the results presented in the main text are not biased by the chosen measure of election fraud, this section replaces that measure with a broader indicator of election integrity from V-Dem. This variable is 'v2xel_frefair,' which is a comprehensive indicator of quality of the electoral process, including measures of electoral management body autonomy and capacity, vote-buying, intimidation, fraud, and an overall assessment of the fairness of the election. This variable ranges from 0 to 1, with higher values indicating freer and fairer elections. The models presented below utilize this variable in place of the main measure of election fraud, while retaining all other control and explanatory variables, using the Mass Mobilization data on protest.

The first model shows that the number of pre-election protests is weakly associated with improved election integrity, but just as in the main text this effect is extremely small. Each additional protest is associated with an improvement in election integrity equivalent to 0.2% of the standard deviation of the dependent variable. Given that the mean number of pre-election protests is six, this is an extremely small influence on the overall degree of election integrity.

Moving to the hurdle models of post-election protest, we do not observe much of a relationship between overall election integrity and protest. There is no statistically significant relationship between election integrity and protest occurrence in Model 2. Neither is there any significant relationship in interaction with the winner's vote-share, as shown in Figure 5, or with economic crisis, as in Figure 7. The coefficient on the interaction term for public sector corruption and overall election integrity is statistically significant, though there is no significant effect at typical values for covariates and election integrity (as shown in Figure 9).

In the corresponding results for the number of post-election protests, there is similarly muted evidence for a connection between the overall level of manipulation and protest risk to incumbents. There is no significant difference between the marginal effect of common levels of election integrity on the number of post-election protests for typical cases across any margin of victory (Figure 4). During an economic crisis, *cleaner* elections are associated with an increase in the number of protests (6). This is plausibly due to the crisis weakening both the government's ability to generate manipulation (Greene 2007) and its ability to co-opt or put down the protests. Finally, public sector corruption is associated with a significant increase in the marginal effect of poor-integrity elections on protest—but only when the corruption measure is at its maximum (Figure 8).

As a whole, the results are in accordance with the theory proposed in the main paper. There is no consistent evidence that lower-quality elections are associated with either a higher risk of protest initiation, or with a larger number of post-election protests.

Table 2: Binary portion of hurdle models of post-election protest

	Model 6	Model 7	Model 8	Model 9
Intercept	−3.034*	−2.002	−2.703**	−1.637+
	(1.205)	(1.303)	(0.878)	(0.905)
Judical independence (lag)	1.440	1.575	0.476	0.933
	(0.950)	(0.959)	(0.784)	(0.790)
Leg. constraints (lag)	0.200	0.200	0.909	0.854
	(0.836)	(0.831)	(0.764)	(0.750)
GDP growth rate (lag)	2.177	2.281		
	(1.360)	(1.396)		
Alternative info. (lag)	−0.437	−0.439	−0.132	0.195
	(1.379)	(1.379)	(1.309)	(1.298)
Public sector corruption (lag)	−0.027	−0.097	0.064	0.789**
	(0.154)	(0.159)	(0.145)	(0.277)
Civil soc. openness (lag)	0.043	0.038	0.027	−0.053
	(0.234)	(0.233)	(0.225)	(0.221)
Economic crisis	−0.047	−0.072	−1.019+	
	(0.288)	(0.290)	(0.587)	
National party organization (lag)	−0.051	−0.041	−0.043	0.027
	(0.187)	(0.188)	(0.170)	(0.176)
Election integrity	0.004	−2.548	−0.377	−1.656
	(1.073)	(1.788)	(0.977)	(1.081)
Incumbent vote-share	−0.228	−2.220		
	(0.811)	(1.383)		
Presidential election	−0.043	−0.072	−0.112	−0.144
	(0.294)	(0.293)	(0.257)	(0.256)
Incumbent term-limited	−0.120	−0.175	0.039	0.065
	(0.454)	(0.457)	(0.433)	(0.430)
Physical integrity (lag)	5.330+	4.719	5.370*	1.483
	(2.966)	(2.985)	(2.598)	(2.663)
Physical integrity (lag), squared	−5.731*	−5.485*	−5.997**	−2.303
	(2.591)	(2.600)	(2.302)	(2.344)
Urbanization	0.003	0.006	0.003	0.007
	(0.007)	(0.008)	(0.007)	(0.007)
Rentier state	−0.397	−0.447	−0.645+	−0.788*
	(0.445)	(0.451)	(0.388)	(0.394)
Tax state	0.124	0.130	0.008	−0.123
	(0.410)	(0.412)	(0.344)	(0.350)
Number of pre-election protests	0.046***	0.046***	0.052***	0.050***
	(0.010)	(0.010)	(0.011)	(0.010)
Election integrity:Incumbent vote-share		5.405+		
		(3.006)		
Economic crisis:Election integrity			2.160+	
			(1.171)	
Public sector corruption (lag):Election integrity				−1.809**

				(0.570)
Num.Obs.	464	464	555	568
AIC	1156.2	1156.8	1337.0	1365.1
BIC	1317.6	1326.6	1496.8	1517.0
RMSE	29.72	29.39	34.50	28.61

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 3: Hurdle models of post-election protest (counts)

	Model 6	Model 7	Model 8	Model 9
Intercept	3.663**	3.704*	1.505	1.652
	(1.384)	(1.751)	(1.040)	(1.262)
Judical independence (lag)	−1.131	−1.132	−1.555+	−0.887
	(1.011)	(1.011)	(0.838)	(0.969)
Leg. constraints (lag)	2.306**	2.306**	2.468***	2.490**
	(0.815)	(0.815)	(0.722)	(0.850)
Alternative info. (lag)	−1.335	−1.342	−2.699*	−2.427
	(1.437)	(1.449)	(1.326)	(1.520)
GDP growth rate (lag)	−1.282	−1.263		
	(2.114)	(2.175)		
Public sector corruption (lag)	−0.256	−0.256	−0.341*	−0.246
	(0.194)	(0.194)	(0.171)	(0.366)
Civil soc. openness (lag)	0.116	0.118	0.188	0.035
	(0.260)	(0.268)	(0.249)	(0.290)
Economic crisis	0.297	0.297	−1.293+	
	(0.356)	(0.357)	(0.677)	
National party organization (lag)	0.428*	0.425*	0.203	0.173
	(0.196)	(0.205)	(0.149)	(0.170)
Election integrity	−0.805	−0.884	0.243	0.470
	(1.197)	(2.395)	(1.015)	(1.401)
Incumbent vote-share	−0.933	−1.007		
	(1.082)	(2.214)		
Presidential election	0.356	0.353	0.544+	0.611+
	(0.339)	(0.351)	(0.288)	(0.351)
Incumbent term-limited	−0.796+	−0.796+	−0.603	−0.875+
	(0.469)	(0.469)	(0.427)	(0.503)
Physical integrity (lag)	−4.726	−4.746	3.271	−1.883
	(4.084)	(4.121)	(3.159)	(3.665)
Physical integrity (lag), squared	3.814	3.824	−3.479	2.607
	(3.506)	(3.517)	(2.836)	(3.144)
Urbanization	0.010	0.010	0.005	0.007
	(0.007)	(0.008)	(0.007)	(0.008)
Rentier state	−1.021+	−1.023+	−0.405	−0.758

	(0.551)	(0.555)	(0.477)	(0.490)
Tax state	−0.246	−0.243	0.170	0.415
	(0.438)	(0.444)	(0.353)	(0.384)
Number of pre-election protests	0.010***	0.010***	0.008***	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)
Election integrity:Incumbent vote-share		0.176		
		(4.612)		
Economic crisis:Election integrity			3.783**	
			(1.382)	
Public sector corruption (lag):Election integrity				−0.375
				(0.851)
Num.Obs.	464	464	555	568
AIC	1156.2	1156.8	1337.0	1365.1
BIC	1317.6	1326.6	1496.8	1517.0
RMSE	29.72	29.39	34.50	28.61

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

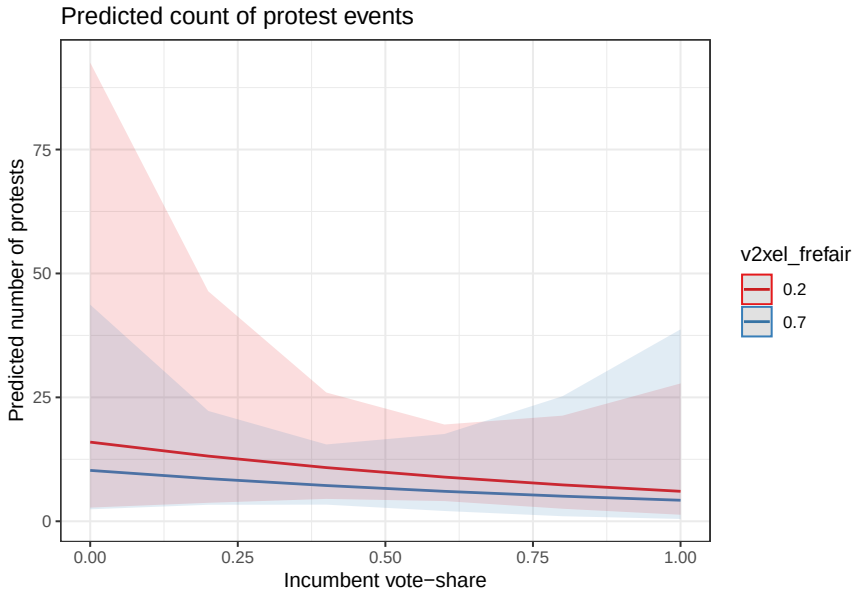

Figure 4: Election integrity, incumbent vote-share, and number of protest events

3 Removing controls to address multicollinearity

The models in the main text include a suite of control variables aimed at controlling for common causes of election manipulation and protest, in order to minimize the risks of confounding and omitted variable bias. However, this approach runs the risk that individual

Table 1: Random-intercept multilevel model of overall election integrity

	Model 10
(Intercept)	0.033
	(0.033)
Judical independence (lag)	0.131**
	(0.042)
Leg. constraints (lag)	−0.091*
	(0.041)
GDP growth rate (lag)	−0.004
	(0.010)
Alternative info. (lag)	0.025
	(0.050)
Civil soc. openness (lag)	−0.010
	(0.010)
Economic crisis	0.004
	(0.008)
National party organization (lag)	0.034***
	(0.009)
Presidential election	−0.007
	(0.006)
Incumbent term-limited	−0.006
	(0.012)
Liberal democracy index (lag)	0.934***
	(0.080)
Urbanization	0.001*
	(0.0005)
Rentier state	0.010
	(0.019)
Tax state	0.025
	(0.020)
Number of pre-election protests	0.0005+
	(0.0003)
Median size of pre-election protests	0.003
	(0.002)
SD (Intercept stateid)	0.097
SD (Observations)	0.061
Num.Obs.	542
R2 Marg.	0.760
R2 Cond.	0.931
AIC	−1087.8
BIC	−1010.5
ICC	0.7
RMSE	0.06

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

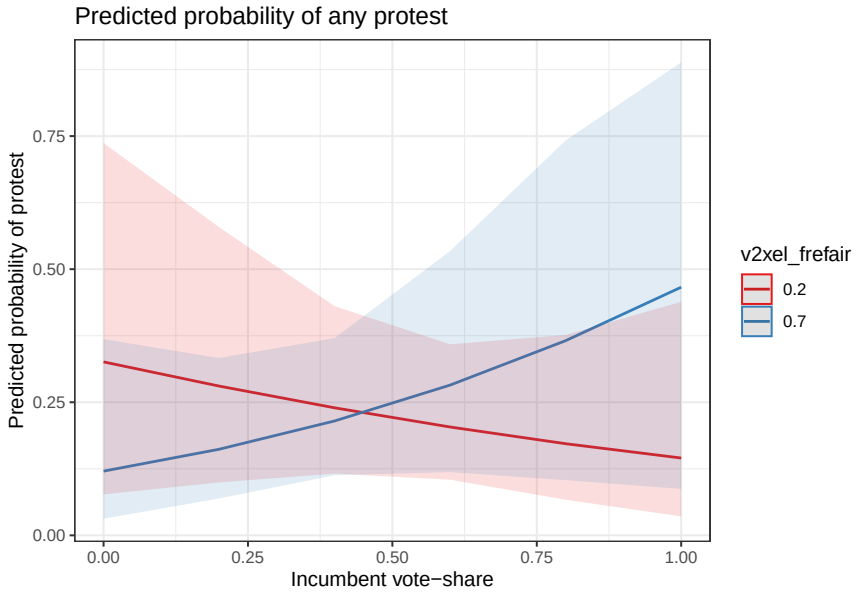

Figure 5: Election integrity, incumbent vote-share, and likelihood of protest

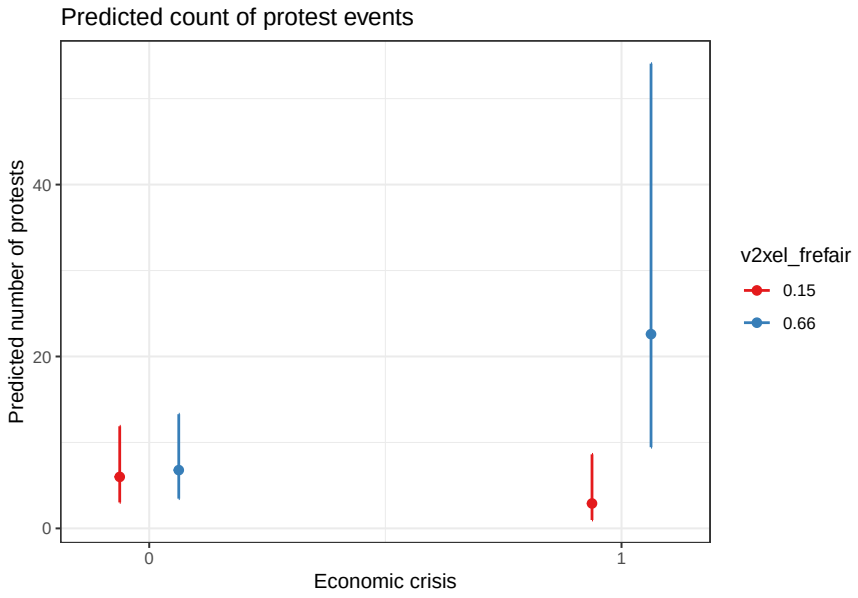

Figure 6: Election integrity, economic crisis, and number of protest events

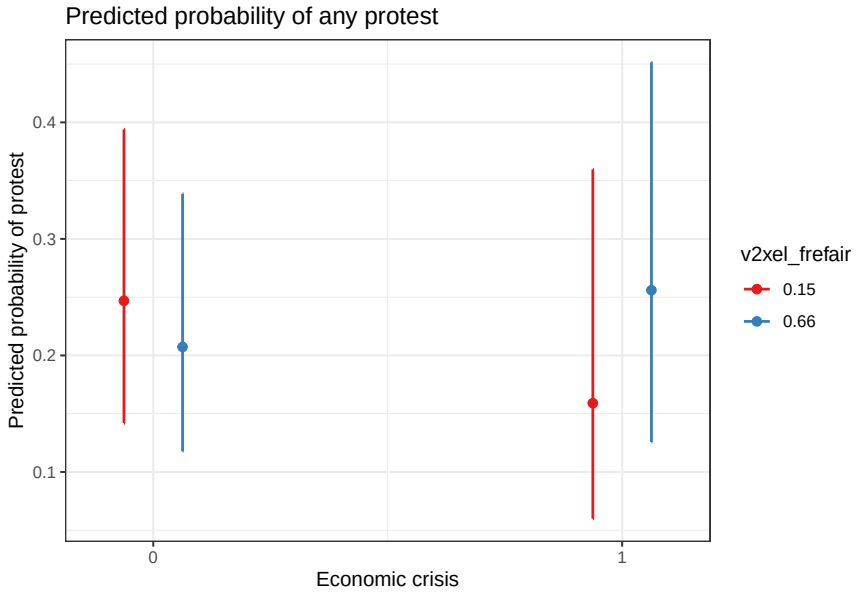

Figure 7: Election integrity, economic crisis, and likelihood of protest

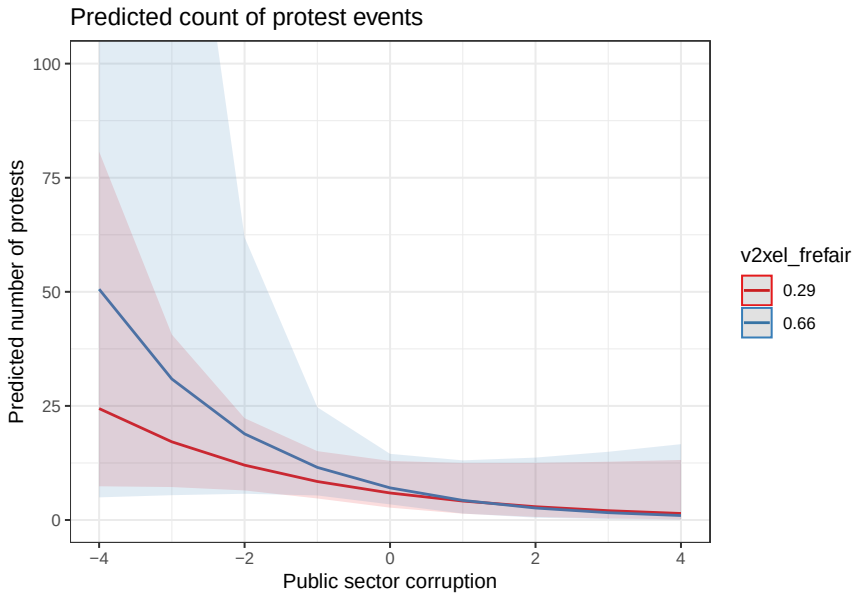

Figure 8: Election integrity, public sector corruption, and number of protest events

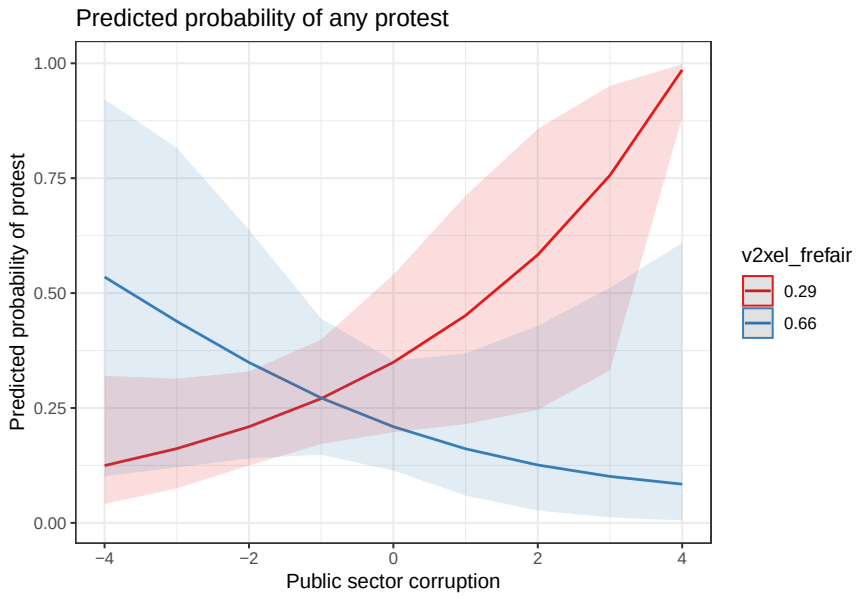

Figure 9: Election integrity, public sector corruption, and likelihood of protest

coefficients may be highly sensitive to model specification due to multicollinearity. In particular, many of the control variables—such as *legislative constraints*, *judicial independence*, and *physical integrity* are likely to be correlated with pre-election protest. To address this risk, the models in Tables 4 and 5 exclude non-electoral control variables. That is, they include variables related to the election itself, the measure of *pre-election protest*, and the explanatory variables from the main models.

The results echo those from the main text. Severity of election fraud is not associated with an increased number of protests, conditional on incumbent vote-share, economic crisis, or public-sector corruption. Marginal effects for interaction terms are presented in the following figures.

Table 4: Binary portion of hurdle models of post-election protest

	Model 11	Model 12	Model 13	Model 14
Intercept	−1.073**	−1.424***	−1.080**	−1.118**
	(0.336)	(0.418)	(0.347)	(0.348)
Election fraud	−0.007	0.418	0.135	0.183
	(0.108)	(0.310)	(0.123)	(0.143)
Presidential election	−0.046	−0.026	−0.047	−0.098
	(0.252)	(0.251)	(0.257)	(0.254)
Incumbent term-limited	−0.016	−0.029	−0.009	0.046
	(0.428)	(0.427)	(0.427)	(0.426)
Number of pre-election protests	0.054***	0.054***	0.055***	0.054***
	(0.011)	(0.011)	(0.011)	(0.011)
Off-schedule election	0.163	0.130	0.244	0.121
	(0.238)	(0.239)	(0.242)	(0.240)
Incumbent vote-share	−0.930	−0.183	−1.017	−0.589
	(0.623)	(0.798)	(0.634)	(0.634)
Election fraud:Incumbent vote-share		−0.804		
		(0.549)		
Economic crisis			0.179	
			(0.284)	
Election fraud:Economic crisis			−0.694**	
			(0.264)	
Public sector corruption (lag)				−0.112
				(0.148)
Election fraud:Public sector corruption				0.305**
				(0.106)
Num.Obs.	522	522	515	527
AIC	1355.9	1357.7	1328.8	1360.6
BIC	1419.8	1430.1	1409.4	1441.7
RMSE	240.26	240.22	453.32	147.80

+ p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001

Table 5: Hurdle models of post-election protest (counts)

	Model 11	Model 12	Model 13	Model 14
Intercept	3.444***	3.466***	2.786***	3.249***
	(0.697)	(0.758)	(0.632)	(0.702)
Election fraud	0.318	0.260	0.497*	0.214
	(0.198)	(0.780)	(0.198)	(0.340)
Presidential election	1.414***	1.422***	1.008**	1.378***
	(0.370)	(0.382)	(0.351)	(0.367)
Incumbent term-limited	−2.016***	−2.025***	−1.283*	−1.914**
	(0.592)	(0.601)	(0.555)	(0.607)
Number of pre-election protests	0.016**	0.016**	0.017**	0.014**
	(0.005)	(0.005)	(0.005)	(0.005)
Off-schedule election	0.326	0.331	0.292	0.157
	(0.397)	(0.401)	(0.350)	(0.426)
Incumbent vote-share	−4.354***	−4.410**	−3.407**	−4.080**
	(1.273)	(1.465)	(1.162)	(1.324)
Election fraud:Incumbent vote-share		0.105		
		(1.353)		
Economic crisis			0.716+	
			(0.366)	
Election fraud:Economic crisis			−0.384	
			(0.454)	
Public sector corruption (lag)				−0.261
				(0.243)
Election fraud:Public sector corruption				0.015
				(0.265)
Num.Obs.	522	522	515	527
AIC	1355.9	1357.7	1328.8	1360.6
BIC	1419.8	1430.1	1409.4	1441.7
RMSE	240.26	240.22	453.32	147.80

+ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

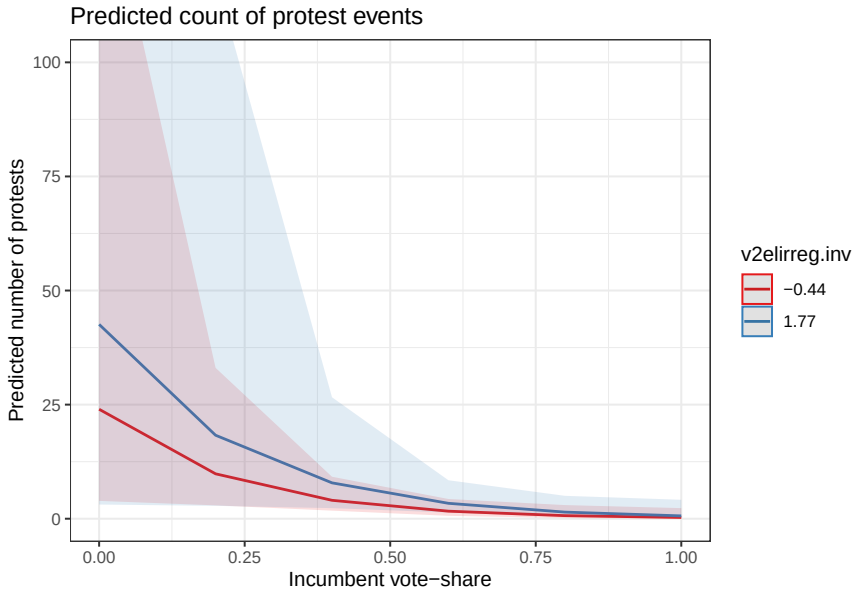

Figure 10: Election integrity, incumbent vote-share, and number of protest events

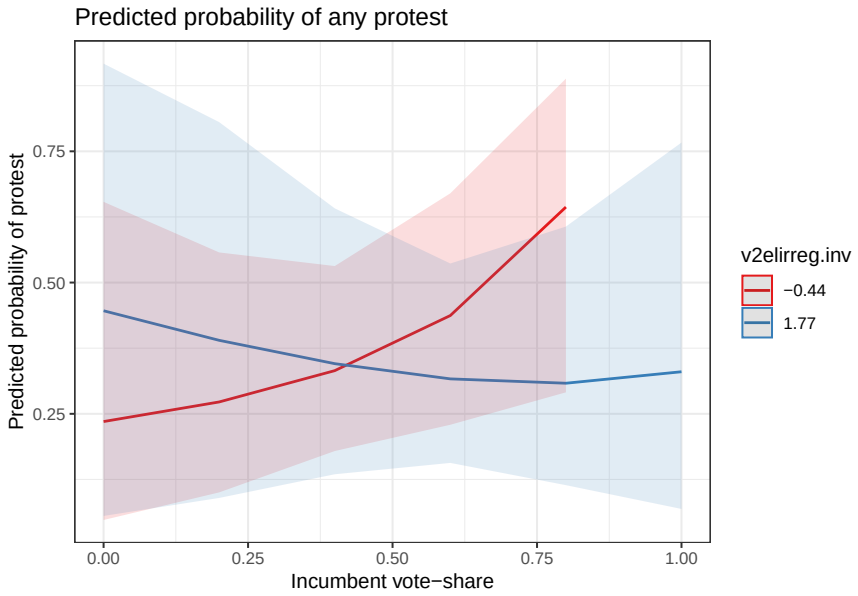

Figure 11: Election integrity, incumbent vote-share, and likelihood of protest

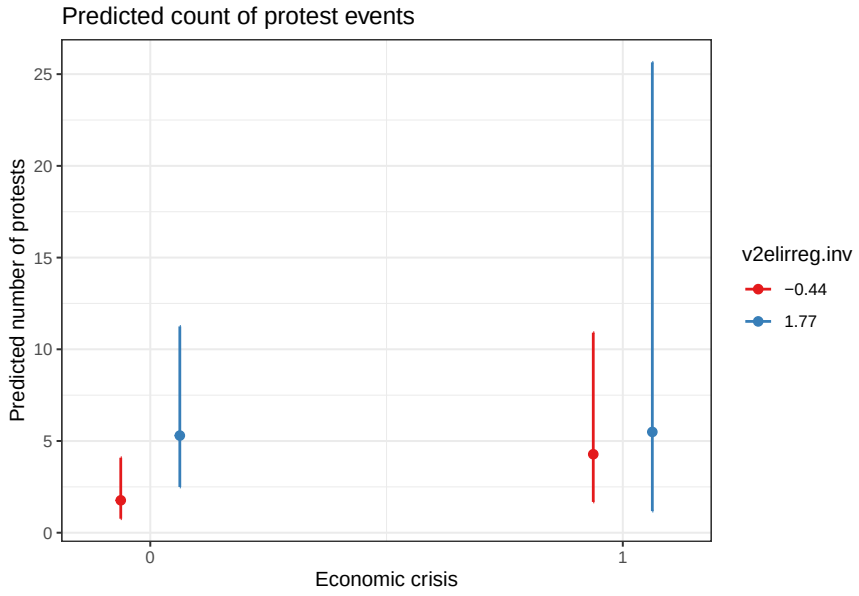

Figure 12: Election integrity, economic crisis, and number of protest events

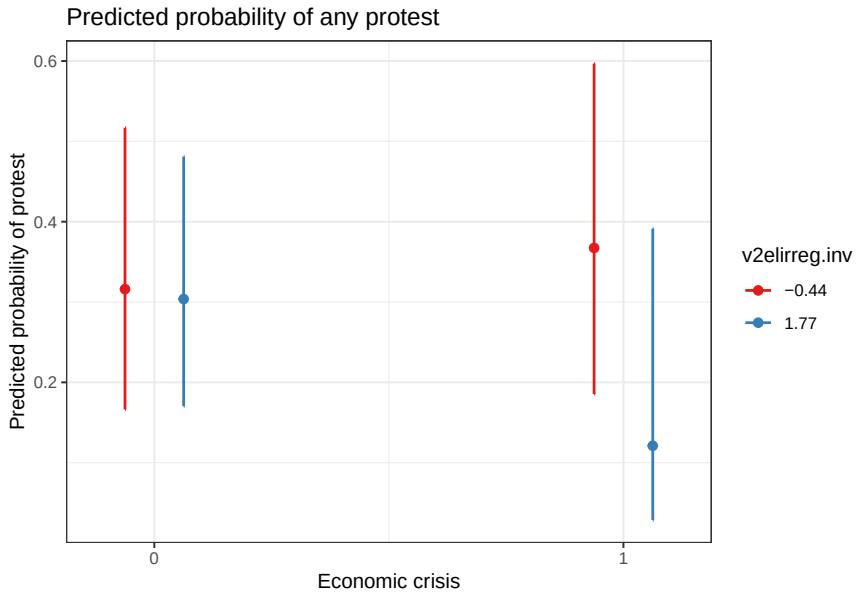

Figure 13: Election integrity, economic crisis, and likelihood of protest

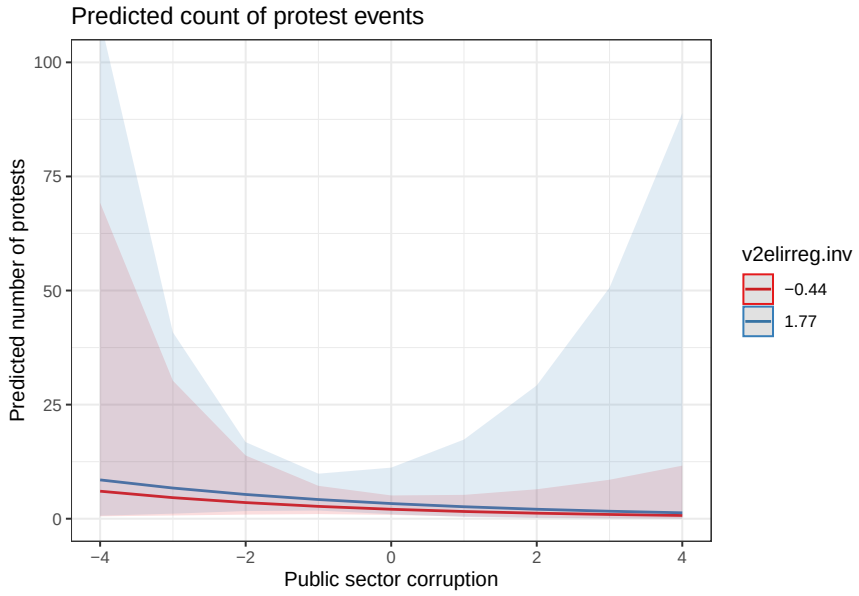

Figure 14: Election integrity, public sector corruption, and number of protest events

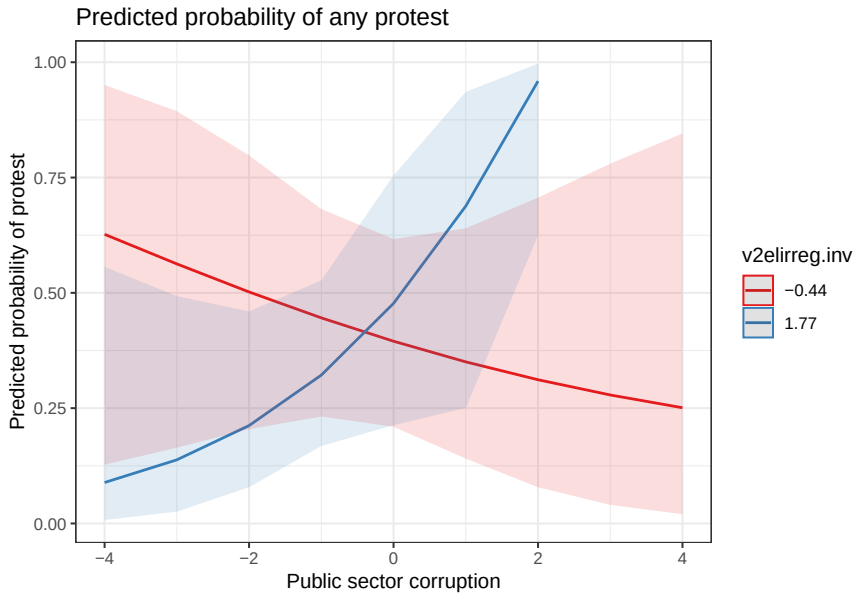

Figure 15: Election integrity, public sector corruption, and likelihood of protest

References

Greene, Kenneth F. 2007. *Why Dominant Parties Lose: Mexico's Democratization in Comparative Perspective*. Cambridge University Press.