On-line appendix of supplemental materials for "Autocratic Institutions and Civil Conflict Contagion."

Descriptive statistics

Table 1 details the descriptive statistics of the full set of covariates included across our model specifications. This includes the number of observations, mean, standard deviation, and range of each of the covariates included across the range of our models.

Table 1: Summary Statistics

	# Obs.	Mean	Std. Dev.	Min.	Max.
Civil War Onset	5076	0.040	0.196	0	1
Legislature	4925	0.703	0.457	0	1
Neighborhood Conflict (continuous, autocracies)	4885	0.184	0.248	0	0.997
Neighborhood Conflict (binary, autocracies)	4982	0.660	0.474	0	1
Neighborhood Conflict (Gower, autocracies)	5052	0.161	0.065	0.02	0.294
Neighborhood Conflict (Gower, legis. autocs)	5052	0.132	0.065	0	0.310
Neighborhood Conflict (continuous, global sample)	5027	0.207	0.240	0.00004	0.994
Neighborhood Conflict (binary, global sample)	5084	0.786	0.410	0	1
Legislature*Neighborhood Conflict (c,a)	4847	0.125	0.215	0	0.997
Legislature*Neighborhood Conflict (b,a)	4798	0.443	0.497	0	1
Legislature*Neighborhood Conflict (G,a)	4831	0.114	0.092	0	0.294
Legislature*Neighborhood Conflict (G,l.a.)	4831	0.093	0.082	0	0.310
Legislature*Neighborhood Conflict (c,g)	4823	0.139	0.212	0	0.994
Legislature*Neighborhood Conflict (b,g)	4891	0.528	0.499	0	1
Neighborhood Democracy	4946	0.280	0.261	0	1
Neighborhood Legislatures	4946	0.760	0.193	0	1
$\ln(\text{GDPpc})_{t-1}$	4508	7.503	0.893	5.333	10.667
$\ln(\text{Population})$	4577	8.942	1.512	4.205	14.097
Post-Cold War	5123	0.312	0.459	0	1
Peace Years	5076	14.558	12.481	0	62
Peace Years^2	5076	367.664	543.480	0	3844
Peace Years^3	5076	11738.08	24777.05	0	238328
Military Regime	4959	0.338	0.473	0	1
Monarchy	4959	0.139	0.346	0	1
Inherited Parties	4946	0.775	0.849	0	2
Past Transitions	4946	0.290	0.647	0	5

Modeling the endogeneity of the creation and maintenance of legislatures to the onset of civil conflict

Table 2: Bivariate Probit Analysis as Robustness Check

	Continuous Measure (autocracies)	Binary Measure (autocracies)	Gower Distance (autocracies)	Gower Distance (legislative autocs)
Civil War Onset				
Legislature	-0.329	-0.484*	-0.826***	-0.649***
	(0.197)	(0.199)	(0.235)	(0.218)
Neighborhood Conflict (c,a)	-0.070			
	(0.221)			
Neighborhood Conflict (b,a)		-0.257		
		(0.152)		
Neighborhood Conflict (G,a)			-2.634*	
			(1.250)	
Neighborhood Conflict (G,l.a.)				-2.273
				(1.278)
Legislature*N.hood Conflict	0.545*	0.404*	3.859*	3.315*
	(0.236)	(0.199)	(1.510)	(1.523)
Neighborhood Democracy	-0.143	-0.200	-0.238	-0.226
	(0.170)	(0.184)	(0.181)	(0.180)
ln(GDPpc)$_{t-1}$	-0.113*	-0.111*	-0.114*	-0.113*
	(0.050)	(0.050)	(0.051)	(0.050)
ln(Population)	0.120***	0.122***	0.122***	0.122***
	(0.032)	(0.034)	(0.034)	(0.033)
Post-Cold War	0.187*	0.232**	0.239*	0.241*
	(0.093)	(0.090)	(0.113)	(0.100)
Peace Years	-0.032*	-0.032	-0.032	-0.032
	(0.016)	(0.017)	(0.017)	(0.017)
Constant	-1.648**	-1.516**	-1.257*	-1.381**
	(0.531)	(0.522)	(0.503)	(0.518)
Legislature				
Neighborhood Conflict variable	-0.351	-0.229	-2.168*	-1.798
(Used in Civil War Onset stage)	(0.244)	(0.122)	(1.069)	(0.989)
Neighborhood Legislature	0.960**	0.844*	0.898**	0.913**
	(0.339)	(0.336)	(0.335)	(0.336)
Military	-0.950***	-0.936***	-0.943***	-0.937***
	(0.168)	(0.166)	(0.166)	(0.167)
Monarchy	-1.264***	-1.244***	-1.281***	-1.270***
	(0.290)	(0.291)	(0.295)	(0.295)
Inherited Parties	0.038	0.036	0.035	0.037
	(0.093)	(0.093)	(0.094)	(0.094)
Past Transitions	-0.400***	-0.417***	-0.402***	-0.403***
	(0.112)	(0.111)	(0.110)	(0.110)
Post-Cold War	0.072	0.104	0.241	0.199
	(0.147)	(0.146)	(0.178)	(0.173)
Peace Years	0.017*	0.017*	0.019*	0.019**
	(0.007)	(0.007)	(0.007)	(0.007)
Constant	0.289	0.452	0.538	0.424
	(0.299)	(0.314)	(0.330)	(0.315)
Log likelihood	-2840.439	-2839.664	-2836.935	-2840.276
Correlation ρ	0.155(0.694)	0.086 (0.769)	0.124 (0.724)	0.155 (0.694)

Notes: N=4344. Significance levels (two-tailed): ∗: 95% ∗∗: 99% ∗∗∗: 99.9%.

Coefficients with robust standard errors in parentheses. Models also estimated with polynomials of Peace Years, not reported here (n.s.).

In the main body of the paper we discuss the possibility that dictators presiding over regimes without legislatures appear somewhat likely to experience a reduction in the likelihood of conflict onset at home given conflict in the neighborhood. We suggest that this may be due to their inclination to pre-emptively repress domestic opposition groups. This speculation neatly aligns with the recent findings of Danneman and Ritter (2012). As an alternative, we recognize that readers may be concerned that dictators, upon observing conflict in neighboring states, may try to appease their own domestic opposition by offering a major concession in the form of establishing or maintaining a legislature. Thus, there may be an issue of endogeneity at play as the presence of a legislature within an autocracy may be related systematically to the occurrence of civil conflict elsewhere in the neighborhood. If this is the case, then the use of an ordinary maximum likelihood estimator such as a probit model will produce biased inferences. We would like to use an instrumental variable to account for the presence of a legislature, but scholars have been hard-pressed to identify an instrument that is exogenous yet simultaneously sufficiently predictive of the dictator's decision to maintain a legislature. Instead, we opt to use a seemingly unrelated bivariate probit model building on each of our three models from the article.[1]

Each of these three models includes a version of the interaction term at the core of our hypothesis testing. In each instance, we find once again that when we take account of the potentially endogenous role of institutional choice, neighboring conflict still has the effect of reversing the dampening effect of legislatures. This suggests that even when accounting for this particular source of endogeneity, we find corroborative evidence for both of our test hypotheses. However, the correlation coefficient ρ does not come close to approaching statistical significance, which suggests that these processes (civil war contagion and the dictator's decision to maintain a legislature) are unrelated processes in the presence of conflict in the neighborhood. As a result, we refer back to the findings of Table 1 in the article as the most appropriate test of our hypotheses. We maintain that autocracies with a legislature are less likely to experience the onset of civil war when there is no conflict in the neighborhood, but once a nearby country becomes embroiled in conflict, this type of institution leaves a dictatorship vulnerable and more prone to armed challenges from its own domestic opposition.

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[1] See Greene (1997, p. 906-911) and Maddala (1983, p. 122) for more information about the mechanics of the bivariate probit.

Conflict in the neighborhood: a global sample

Our theory and tests focus upon the possibility that opposition groups are inspired to fight and emulate those struggles in nearby states—the concept of "nearby" comprising both those states that are georgaphically proximate and those that are structurally equivalent to the state of interest. While we restrict the analysis reported in the article to include only those physically proximate states that are autocracies, we also run the same analyses on a sample that includes all states in the international system, both democratic and non-democratic. The results, which are in keeping with the findings reported in the article, are presented in Table 3.

Table 3: Global Sample

	Continuous Measure	Binary Measure
Legislature	-0.309**	
	(0.109)	
Neighborhood Conflict (c)	-0.060	-0.521**
	(0.290)	(0.184)
Neighborhood Conflict (b)		-0.216
		(0.186)
Legislature*N.hood Conflict (c)	0.658*	
	(0.315)	
Legislature*N.hood Conflict (b)		0.457*
		(0.211)
Neighborhood Democracy	-0.126	-0.160
	(0.168)	(0.174)
ln(GDPpc)$_{t-1}$	-0.111*	-0.113*
	(0.047)	(0.049)
ln(Population)	0.117***	0.117***
	(0.032)	(0.033)
Post-Cold War	0.189*	0.214*
	(0.089)	(0.087)
Peace Years	-0.032	-0.031
	(0.017)	(0.017)
Constant	-1.676***	-1.494**
	(0.462)	(0.485)
Log likelihood	-701.455	-703.701
No. of observations	4344	4344

Notes: Significance levels (two-tailed): $*$: 95% $**$: 99% $***$: 99.9%.

Coefficients with robust standard errors in parentheses. Models also estimated with polynomials of Peace Years, not reported here (n.s.).

New vs. old legislatures

One of the reviewers raised an interesting question regarding the possibility that autocracies with newly created legislatures may be more or less prone to contagion that autocracies with old legislatures. The reviewer speculated that new legislatures might signal a more immediate moment of regime weakness, whereas older legislatures that have existed for a long time might afford the opposition more time to organize and overcome collective action problems, thereby posing a more significant threat to the regime. Our own logic contends that the likelihood of contagion actually varies in conjunction with changes in the conflict environment in the state's neighborhood rather than with the maturation of the legislature.

We examine these competing lines of reasoning here as a check of the robustness of our logic and findings. First, we created binary measures distinguishing between "new" and "old" legislatures. We generated five unique variables, coded 1 if a legislature had been established in the previous year, two years, three years, four years, or five years respectively. We then interacted these variables with the continuous weighted distance to conflict in the neighborhood variable (restricted to the population of autocracies) and included the control variables from the main models specified in the article. We run these tests both for the full sample (results reported in Table 4) and for the sample of only those states with legislatures (results reported in Table 5). In the first instance, the parameter estimates on the new legislature variable and its interaction with neighborhood conflict provide a direct comparison of the likelihood of contagion to states with new legislatures as compared to those with older or no legislature. In the second instance (and perhaps more reasonably) these parameters contrast the effect in states with new and older legislatures more directly. In both cases, we anticipate observing a lack of statistical significance, which would suggest that contagion is no more or less likely in states with "new" legislatures.

None of the new legislature variables or the interaction terms demonstrate statistical significance, and as a result we do not believe that cases of recently introduced legislatures are any more prone to conflct contagion than are cases with more established legislatures. Instead, we refer the reader to the main findings in the article, which suggest that the presence of a legislature—regardless of its novelty—is sufficient to make civil war more likely when there is conflict in the neighborhood.

Table 4: New vs. Old Legislatures: All Autocracies

	Year 1	Years 1-2	Years 1-3	Years 1-4	Years 1-5
New Legislature	0.089	0.079	0.080	0.017	0.035
	(0.261)	(0.224)	(0.151)	(0.133)	(0.123)
Neighborhood Conflict (c,a)	0.246	0.253	0.181	0.132	0.175
	(0.159)	(0.163)	(0.180)	(0.179)	(0.181)
New Legislature*N.hood Conflict	0.343	0.178	0.525	0.620	0.344
	(0.343)	(0.571)	(0.366)	(0.323)	(0.292)
Neighborhood Democracy	-0.192	-0.193	-0.202	-0.207	-0.201
	(0.164)	(0.165)	(0.167)	(0.168)	(0.167)
$\ln(\text{GDPpc})_{t-1}$	-0.100*	-0.100*	-0.093	-0.093	-0.096
	(0.049)	(0.049)	(0.049)	(0.050)	(0.049)
ln(Population)	0.122***	0.122***	0.123***	0.121***	0.121***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Post-Cold War	0.185*	0.184*	0.185*	0.187*	0.188*
	(0.090)	(0.090)	(0.092)	(0.092)	(0.091)
Peace Years	-0.035*	-0.035*	-0.034*	-0.034*	-0.034*
	(0.017)	(0.017)	(0.016)	(0.016)	(0.016)
Constant	-1.940***	-1.945***	-1.997***	-1.982***	-1.967***
	(0.454)	(0.462)	(0.458)	(0.466)	(0.465)
Log likelihood	-705.956	-705.237	-703.563	-703.078	-705.030
No. of observations	4344	4344	4344	4344	4344

Notes: Significance levels (two-tailed): ∗: 95% ∗∗: 99% ∗∗∗: 99.9%.

Coefficients with robust standard errors in parentheses.

Table 5: New vs. Old Legislatures: Autocracies with Legislatures

	Year 1	Years 1-2	Years 1-3	Years 1-4	Years 1-5
New Legislature	0.218	0.155	0.250	0.165	0.212
	(0.258)	(0.240)	(0.163)	(0.151)	(0.143)
Neighborhood Conflict (c,a)	0.403*	0.412*	0.353	0.250	0.321
	(0.172)	(0.180)	(0.189)	(0.200)	(0.204)
New Legislature*N.hood Conflict	0.143	0.010	0.233	0.507	0.231
	(0.681)	(0.584)	(0.420)	(0.403)	(0.372)
Neighborhood Democracy	-0.581**	-0.581**	-0.601**	-0.615**	-0.606**
	(0.210)	(0.211)	(0.213)	(0.213)	(0.214)
$\ln(\text{GDPpc})_{t-1}$	-0.061	-0.062	-0.045	-0.040	-0.044
	(0.060)	(0.060)	(0.059)	(0.059)	(0.059)
ln(Population)	0.107***	0.107***	0.107***	0.106***	0.107***
	(0.029)	(0.029)	(0.028)	(0.028)	(0.028)
Post-Cold War	0.331**	0.330**	0.338**	0.343**	0.345**
	(0.109)	(0.110)	(0.111)	(0.111)	(0.111)
Peace Years	-0.028	-0.026	-0.025	-0.025	-0.024
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
Constant	-2.188***	-2.191***	-2.346***	-2.362***	-2.373***
	(0.532)	(0.537)	(0.528)	(0.537)	(0.538)
Log likelihood	-442.422	-442.748	-439.736	-438.613	-439.695
No. of observations	3025	3025	3025	3025	3025

Notes: Significance levels (two-tailed): ∗: 95% ∗∗: 99% ∗ ∗ ∗: 99.9%.

Coefficients with robust standard errors in parentheses.

Legislatures in the neighborhood

An alternative to our measure of the % of neighbors that are democratic is to measure the % of neighbors (democratic and autocratic) with legislatures. One of our reviewers suggested that this might better capture the institutional context within which states reside. Thus, we generated a variable that captures the proportion of states within 950 km minimum distance that have an elected legislature. The results presented in Table 6 are a replication of the models reported in the paper, except that they use this variable capturing the neighborhood's "legislature environment" in place of *Neighborhood Democracy*.

Table 6: Legislatures in the Neighborhood

	Continuous Measure (autocracies)	Binary Measure (autocracies)	Gower Distance (autocracies)	Gower Distance (legislative autocs)
Legislature	-0.248*	-0.405*	-0.721**	-0.545**
	(0.102)	(0.157)	(0.233)	(0.192)
Neighborhood Conflict (c,a)	-0.059			
	(0.220)			
Neighborhood Conflict (b,a)		-0.244		
		(0.150)		
Neighborhood Conflict (G,a)			-2.401	
			(1.248)	
Neighborhood Conflict (G,l.a.)				-2.086
				(1.279)
Legislature*N.hood Conflict	0.516*	0.382*	3.655*	3.124*
	(0.240)	(0.196)	(1.494)	(1.511)
Neighborhood Legislatures	-0.347	-0.401	-0.413	-0.412
	(0.215)	(0.218)	(0.214)	(0.213)
$\ln(\text{GDPpc})_{t-1}$	-0.118*	-0.119**	-0.124**	-0.122**
	(0.047)	(0.045)	(0.046)	(0.046)
ln(Population)	0.119***	0.120***	0.120***	0.120***
	(0.031)	(0.032)	(0.032)	(0.032)
Post-Cold War	0.199*	0.244**	0.238*	0.245*
	(0.090)	(0.087)	(0.108)	(0.096)
Peace Years	-0.033*	-0.033	-0.033	-0.033
	(0.016)	(0.017)	(0.017)	(0.017)
Constant	-1.430**	-1.240**	-0.985*	-1.108*
	(0.448)	(0.422)	(0.430)	(0.441)
Log likelihood	-701.818	-702.520	-700.064	-701.263
No. of observations	4344	4344	4344	4344

Notes: Significance levels (two-tailed): ∗: 95% ∗∗: 99% ∗∗∗: 99.9%.

Coefficients with robust standard errors in parentheses. Models also estimated with polynomials of Peace Years, not reported here (n.s.).

Structural Equivalence: Autocracies with Legislatures

While the findings across the three models presented in the article are robust to a variety of conceptualizations of conflict in the neighborhood, we present one more specification here. The structural equivalence measure used in the article comprises all autocracies; here, we construct a slightly more restrictive version of this measure by capturing the percentage of autocracies *with elected legislatures* across the system that experienced a civil war in the previous year. The findings in Table 7 are in keeping with those reported in the article.

Table 7: Structural Equivalence: Autocratic Legislatures

|	Structural Equiv. (Autocratic Legislatures)
Legislature	-0.582**
	(0.194)
Neighborhood Conflict (s.e.)	-2.231
	(1.318)
Legislature*N.hood Conflict (s.e.)	3.306*
	(1.539)
Neighborhood Democracy	-0.238
	(0.175)
$\ln(\text{GDPpc})_{t-1}$	-0.110*
	(0.048)
ln(Population)	0.122***
	(0.034)
Post-Cold War	0.235*
	(0.096)
Peace Years	-0.032
	(0.017)
Constant	-1.441**
	(0.452)
Log likelihood	-702.267
No. of observations	4344

Notes: Significance levels (two-tailed): $*$: 95% $**$: 99% $***$: 99.9%.

Coefficients with robust standard errors in parentheses. Models also estimated with polynomials of Peace Years, not reported here (n.s.).

Graphing substantive results for structural equivalence measure of "neighborhood" conflict (model 3)

We opted to include a graph of the predicted probabilities from our Model 1 results in the article text. In addition, we now present a graph of the predicted probabilities associated with the results from Model 3, which employed the structural equivalence measure of conflict in the neighborhood. Recall that this measures captures the % of autocratic states in the system in the previous year that experienced ongoing civil conflict. This measure is designed to capture the extent to which countries with similar regime types influence conflict contagion. The results are presented in Figure 1, which details the predicted probability of civil war onset at home (on the y-axis) as the value of the structural equivalence measure of "neighborhood" conflict (the x-axis) increases. The graph compares the predicted probabilities for autocracies without legislatures (the dashed line) to those for autocracies with a legislature (the solid line). In order to demonstrate the the significant and substantively important results are not exclusive to outlying or rare cases, we also include a rug plot along the horizontal axis depicting the distribution of observations on the continuous conflict in the neighborhood variable. The important take home point is that low values of neighborhood conflict are associated with a relatively peaceful state for autocracies with legislatures, whereas high values are associated with a relatively conflict-prone state for autocracies with legislatures (in both cases, as compared to autocracies without legislatures).

Figure 1: Predicted Probability of Civil War Onset As Neighborhood Conflict (Structural Equivalence Measure) Changes
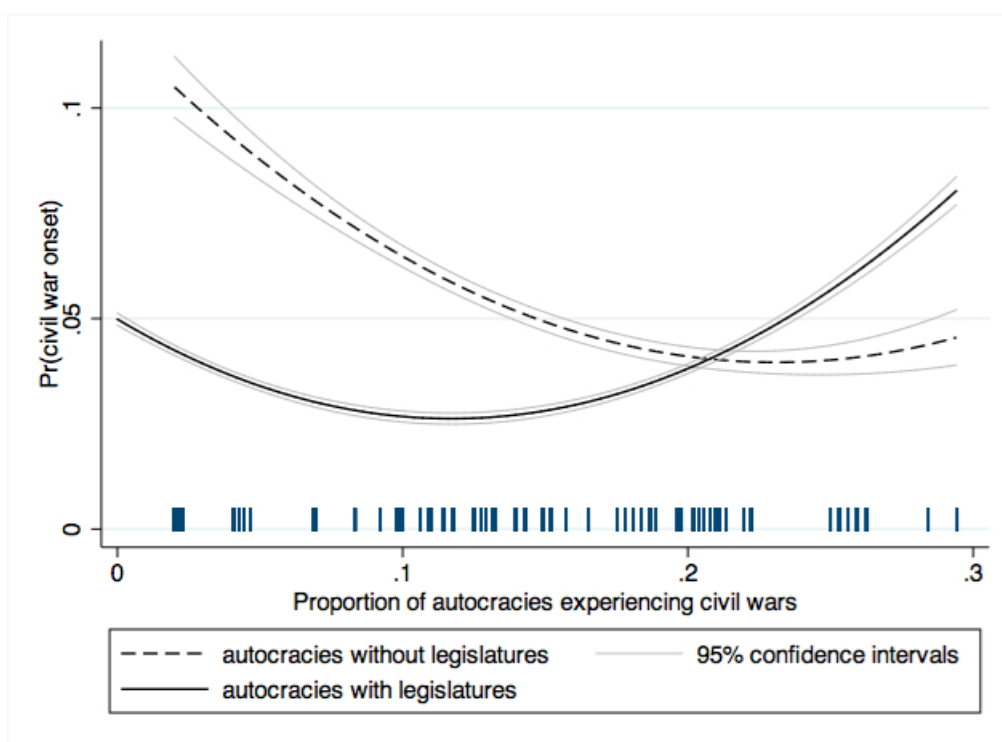
Models without interaction terms

In previous drafts of this article we included versions of the main models where the interaction term was omitted. A reviewer pointed out that, if the data generating process is in accordance with our expectations, this constitutes omitted variable bias and thus the models without the interaction term could be dropped. We follow this reviewer's suggestion, and report the results of these models in Table 8. We are comfortable doing so, because, as they noted, these findings do not provide a test of our hypotheses.

Table 8: Models Without Interactions

	Continuous Measure (autocracies)	Binary Measure (autocracies)	Gower Distance (autocracies)	Gower Distance (legislative autocs)
Legislature	-0.141 (0.083)	-0.141 (0.081)	-0.141 (0.081)	-0.142 (0.081)
Neighborhood Conflict (c,a)	0.263 (0.153)			
Neighborhood Conflict (b,a)		-0.001 (0.081)		
Neighborhood Conflict (G,a)			-0.128 (0.829)	
Neighborhood Conflict (G,l.a.)				-0.100 (0.682)
Neighborhood Democracy	-0.165 (0.167)	-0.201 (0.179)	-0.207 (0.170)	-0.206 (0.170)
$\ln(\text{GDPpc})_{t-1}$	-0.102* (0.049)	-0.107* (0.049)	-0.107* (0.050)	-0.107* (0.050)
ln(Population)	0.120*** (0.032)	0.124*** (0.033)	0.124*** (0.033)	0.124*** (0.033)
Post-Cold War	0.197* (0.090)	0.230** (0.086)	0.242* (0.106)	0.239* (0.095)
Peace Years	-0.034* (0.016)	-0.033* (0.016)	-0.034* (0.016)	-0.033* (0.016)
Constant	-1.830*** (0.462)	-1.772*** (0.459)	-1.758*** (0.464)	-1.765*** (0.461)
Log likelihood	-704.830	-706.631	-706.619	-706.622
No. of observations	4344	4344	4344	4344

Notes: Significance levels (two-tailed): $*$: 95% $**$: 99% $***$: 99.9%.

Coefficients with robust standard errors in parentheses. Models also estimated with polynomials of Peace Years, not reported here (n.s.).