Supplementary Appendix to "Policy Disputes, Political Survival, and the Onset and Severity of State Repression"

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1 Proof of Equilibrium Behavior

In the final stage $t = 3$, S and G simultaneously choose levels of repression and dissent. The first order conditions of their utility functions are $\frac{\partial U_S}{\partial r} = -\frac{1}{c} + \frac{dp}{2(d+r)^2} = 0$, which ensures r^* will be a maximum because $\left(\frac{\partial^2 U_S}{\partial r^2} = -\frac{dp}{(d+r)^3} < 0\right)$, and $\frac{\partial U_G}{\partial d} = -\frac{1}{k} + \frac{pr}{(d+r)^2} = 0$, which ensures d^* will be a maximum because $\left(\frac{\partial^2 U_G}{\partial d^2} = -\frac{pr}{(d+r)^3} < 0\right)$. Solving simultaneously for d and r yields

$$d^* = \frac{2ck^2p}{(c+2k)^2} \quad \text{and} \quad r^* = \frac{c^2kp}{(c+2k)^2}.$$

In stage $t = 2$, G either accepts or rejects S's proposed policy. Substituting r^* and d^* into G's utility function, G will accept any proposal greater than its utility for conflict:

$$x \geq -\frac{d^*}{k} + \left(1 - \frac{d^*}{d^* + r^*}\right)\left[(1-p)\right] + \left(\frac{d^*}{d^* + r^*}\right) \times 1$$
$$x \geq 1 - \frac{cp(c+4k)}{(c+2k)^2} \equiv x'$$

This minimum acceptable bargain, x', is always positive and less than or equal to one, such that there is always a bargain the group will accept rather than engage in conflict. If S bargains, he optimizes his utility by offering G no more than the minimum division it will accept, or $x = x'$. S offers $x^* = x'$ rather than $x^* = 0$, so that G accepts the policy rather than dissenting, when :

$$\frac{p}{1+x'}(1) + \left(1 - \frac{p}{1+x'}\right)(0) \geq -\frac{r^*}{c} + \left(1 - \frac{d^*}{r^* + d^*}\right)\left[p * 1\right] + \left(\frac{d^*}{r^* + d^*}\right)\left(\frac{p}{2} * 1\right)$$

Substituting the values for r^*, d^*, and x' into the above inequality, S prefers to bargain when $p > p'$, where $p' \equiv \frac{c(c+2k)^2}{(c+4k)(c^2+2ck+2k^2)}$.

2 Comparative Statics

Proof of Implication 1. The derivative of x' with respect to p is $\frac{\partial x'}{\partial p} = -\frac{c(c_4 k)}{(c+2k)^2} < 0$. As this cut-point decreases, there is a smaller range of offers the group would reject. □

Proof of Implication 2. By Proposition 1, repression occurs only when $p \leq p'$ and does not occur when $p > p'$. □

Proof of Implication 3. The derivative of r^* with respect to p is $\frac{\partial r^*}{\partial p} = \frac{c^2 k}{(c+2k)^2} > 0$. □

Proof of Implication 4. The derivative of d^* with respect to p is $\frac{\partial d^*}{\partial p} = \frac{2ck^2}{(c+2k)2} > 0$. □

3 Descriptive Statistics

3.1 Measuring Repression and Dissent

The estimates reported in the article use measures of rights violations and dissent that facilitate the prediction of both the onset and the severity of these behaviors. This section describes the data created for empirical analysis of the theoretical implications in more detail; some of this text is drawn directly from my dissertation (Ritter 2010). More detail on the Integrated Data for Events Analysis (IDEA) dataset can be found in King and Lowe (2003).

The Taylor et al. (1999) Conflict-Cooperation Scale for Inter- and Intrastate Interactions places conflictual events on an ordinal scale with a linear-like relationship, which may not be an appropriate approximation of the actual relationship between these behaviors. While the scale was developed to assign each event a weight rather than a ranking,[1] the weights are still based on the (informed) opinions of scholars. Weights suggest a sense of equality among events that could be seen as very qualitatively different. How many instances of torture is the equivalent of one extrajudicial killing? Is a state-wide curfew the equivalent of isolated beatings? These events are difficult to compare. The scale seems increasingly ambiguous in the small differences, as it is difficult to assess qualitatively whether a beating (weighted -8.689) is more or less severe than an abduction (weighted -8.532), though this index suggests they are quantitatively different. While using such a scale ranks among the most reliable and valid ways to quantify such a concept as the severity of conflict, basing the scale on scholarly opinions introduces ambiguity to any weighting system.

In an attempt to use the most valid measure of onset and severity possible, I selected three dissent event forms and three repression event forms to represent the range of severity of each of these behaviors.[2] Table 1 lists the selected event forms and their respective severity weights. They serve to represent a varied range of violence, coercion, and disruption. When comparing them qualitatively, one event type is clearly more severe than another. I aggregate these selected types of weighted events at the annual level of observation for each state. Dividing the sum of levels by the number of conflict events reported for the year serves to account for the fact that the media is able to investigate and report more for some states than others.

Histograms describing the distribution of the severity of repression and dissent can be found in Figure 1. These histograms include the values of all instances of repression or dissent given that either dissent or repression has occurred.

This process of weighting types of repressive and dissent events accomplishes two tasks: (a) it creates a relatively continuous yet meaningful measure of the severity of repression or dissent and (b) identifies instances in which repression and/or dissent occurred.

[1] The Shellman (2004) piece criticizes ordinal rankings as being unrepresentative of the actual relationship between behaviors and develops a weighting system in the same style of Taylor et al. (1999).

[2] I also estimated the empirical models using a versions of onset and severity created with over fifty different event forms for both repression and dissent, which yielded supportive results, reported below in this appendix.

Table 1: Event Forms Chosen for Analysis

Repression			Dissent		
Event Form	Weight	Freq	Event Form	Weight	Freq
Armed Hostilities[a]	-10.399	2542	Armed Hostilities[d]	-10.399	2024
Non-armed Physical Force against Human Targets[b]	-8.514	3210	Non-armed Physical Force against Human Targets[e]	-8.514	2497
Declare Martial Law or Curfew[c]	-5.813	2413	Non-armed Protests[f]	-5.042	2268

[a] IDEA event form armed hostilities <RAID>.
[b] IDEA event forms physical assault <PASS>, corporal punishment <CORP>, and beating <BEAT>.
[c] IDEA event form declare martial law or curfew & the imposition of similar rules <BANA>.
[d] IDEA event form armed hostilities <RAID>.
[e] IDEA event forms physical assault <PASS>, corporal punishment <CORP>, and beating <BEAT>.
[f] IDEA event forms non-military protests & sit-ins <POBS>, protest processions <PMAR>, and protests that place participants at risk <PALT>.

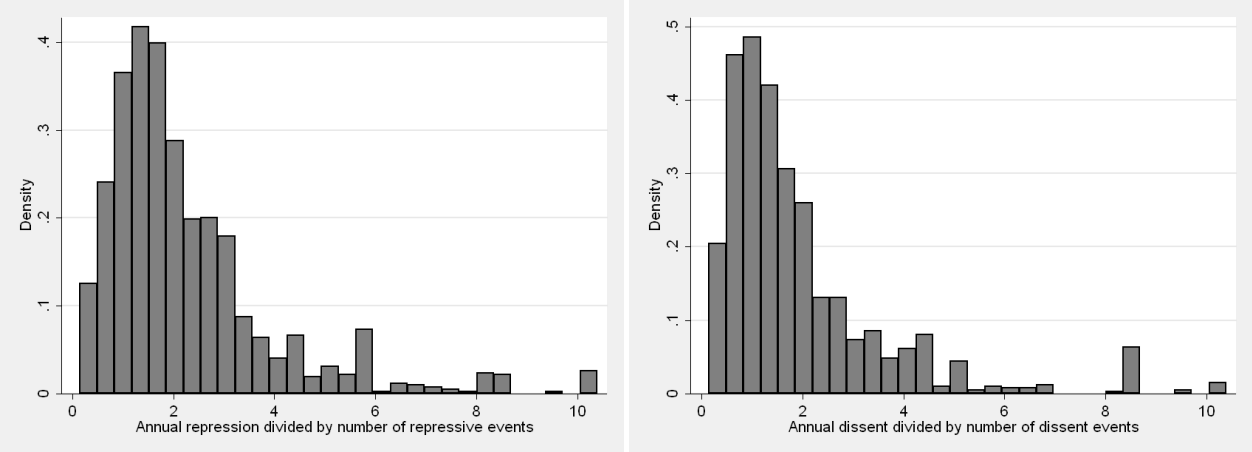

Figure 1: Histograms of severity of repression (left) and dissent (right), given that one of the two actions have occurred.

Variable		Mean	Std. Dev.	Min	Max	Observations
Repression Onset	overall	0.537	0.499	0.000	1.000	$N = 2294$
	between		0.339	0.000	1.000	$n = 157$
	within		0.368	-0.396	1.471	$\bar{T} = 14.6115$
Repression Severity	overall	4.325	4.152	0.000	10.399	$N = 2294$
	between		2.830	0.000	9.296	$n = 157$
	within		3.057	-4.402	14.031	$\bar{T} = 14.6115$
Dissent Onset	overall	0.523	0.500	0.000	1.000	$N = 2294$
	between		0.325	0.000	1.000	$n = 157$
	within		0.380	-0.411	1.456	$\bar{T} = 14.6115$
Dissent Severity	overall	3.897	3.989	0.000	10.399	$N = 2294$
	between		2.554	0.000	9.834	$n = 157$
	within		3.067	-4.648	13.603	$\bar{T} = 14.6115$
Job Security	overall	0.804	0.100	0.000	0.917	$N = 2075$
	between		0.093	0.000	0.900	$n = 145$
	within		0.032	0.597	1.010	$\bar{T} = 14.3103$
Military Personnel	overall	0.599	0.605	0.000	5.781	$N = 2238$
(percent of population)	between		0.565	0.000	3.347	$n = 160$
	within		0.217	-1.376	3.033	$\bar{T} = 13.9875$
Involvement in	overall	0.017	0.131	0.000	1.000	$N = 2364$
International War	between		0.046	0.000	0.200	$n = 163$
	within		0.122	-0.183	0.951	$\bar{T} = 14.5031$
GDP per capita	overall	0.035	0.063	-0.614	0.530	$N = 2026$
(Differenced and Natural Log)	between		0.025	-0.039	0.200	$n = 147$
	within		0.058	-0.600	0.365	$\bar{T} = 13.7823$
Population	overall	0.015	0.044	-1.279	0.260	$N = 2145$
(Differenced and Natural Log)	between		0.016	-0.069	0.048	$n = 159$
	within		0.041	-1.195	0.227	$\bar{T} = 13.4906$

Table 2: Descriptive cross-sectional time-series statistics for indicators used in estimates reported in the article.

3.2 Job Security

Table 3 lists detailed statistics to describe the observed values for the indicator of *Job Security* that is used in the reported estimates. This variable is the predicted probability that the head of government will remain in office in a given year, as described in the article and estimated by (Conrad and Ritter 2013). Figure 2 illustrates the distribution of the indicator observed in the sample.

	Percentiles	Smallest		
1%	0.442	0.000		
5%	0.649	0.000		
10%	0.719	0.000	Obs	2075
25%	0.786	0.000	Sum of Wgt.	2075
50%	0.826	Largest	Mean	0.804
75%	0.856	0.912	Std. Dev.	0.100
90%	0.878	0.912	Variance	0.010
95%	0.888	0.912	Skewness	-4.493
99%	0.903	0.917	Kurtosis	33.034

Table 3: Detailed statistics for *Job Security*.

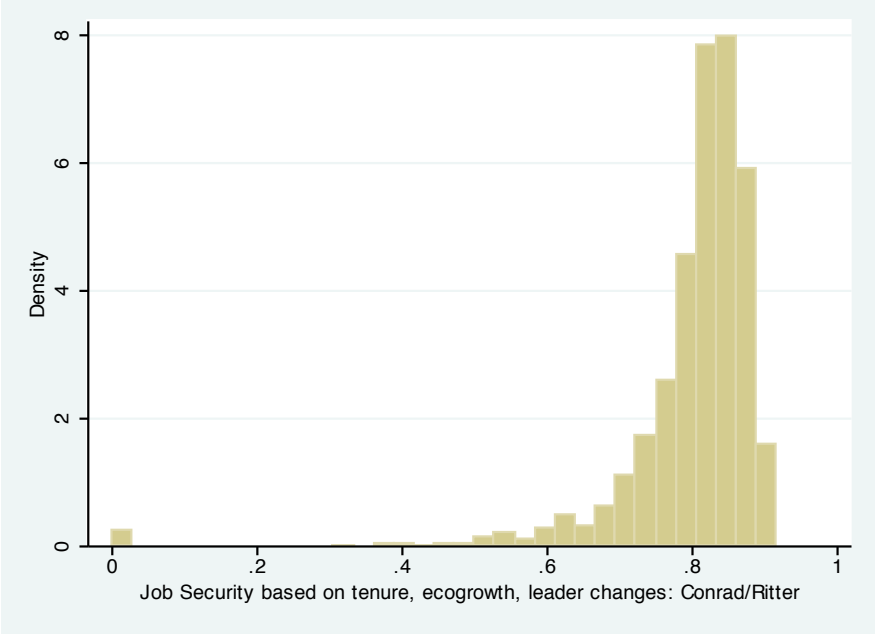

Figure 2: Histogram depicting the distribution of *Job Security* observed in the sample.

4 Robustness Checks

Table 4: Estimated empirical models using measures of Repression and Dissent Onset and Severity created from a very wide range of conflictual events found in the IDEA data.

	(1) Repression	(2) Dissent
Job security (Conrad) (t-1)	-0.289	-2.383
	[-1.326,0.748]	[-3.850,-0.915]
Repression onset (t-1), all repevent types	0.784	0.889
	[0.581,0.988]	[0.694,1.084]
Dissent onset (t-1), all dissevent types	1.030	1.029
	[0.827,1.232]	[0.732,1.326]
Military personnel (pct) (t-1)	0.227	0.0745
	[0.0360,0.418]	[-0.182,0.331]
Involvement in conflict (t-1)	4.904	4.938
	[4.414,5.394]	[4.434,5.441]
GDP per capita, FD (t-1)	0.215	0.0414
	[-0.858,1.287]	[-1.217,1.300]
Population, FD (t-1)	-2.001	-1.523
	[-5.506,1.503]	[-4.173,1.127]
Constant	-0.195	1.448
	[-1.064,0.674]	[0.200,2.696]
Job security (Conrad) (t-1)	1.152	0.586
	[0.179,2.124]	[-0.707,1.879]
Repression severity (t-1), all repevent types	0.0709	0.103
	[0.00741,0.134]	[0.0428,0.164]
Dissent severity (t-1), all dissevent types	0.178	0.160
	[0.121,0.235]	[0.0916,0.228]
Military personnel (pct) (t-1)	-0.112	-0.105
	[-0.418,0.193]	[-0.408,0.198]
Involvement in conflict (t-1)	0.536	0.531
	[-0.0298,1.102]	[-0.0344,1.097]
GDP per capita, FD (t-1)	-1.493	0.710
	[-3.201,0.215]	[-1.157,2.578]
Population, FD (t-1)	4.346	2.701
	[0.728,7.965]	[-1.123,6.525]
Constant	3.520	3.909
	[2.700,4.339]	[2.780,5.037]
sigma		
Constant	1.816	1.842
	[1.694,1.938]	[1.722,1.961]
Observations	1697	1697

95% confidence intervals in brackets

Table 5: Estimated empirical models using an indicator of *Job Security* that incorporates irregular turnover and regime type in addition to the core model, thus accounting in part for violence as a cause of removal.

	(1) Repression	(2) Dissent
Job security, full model (Conrad) (t-1)	-0.417	-1.110
	[-1.113,0.278]	[-1.903,-0.316]
Repression onset (t-1), 3 repevent types	0.864	0.854
	[0.688,1.041]	[0.703,1.004]
Dissent onset (t-1), 3 dissevent types	0.663	0.706
	[0.512,0.814]	[0.547,0.865]
Military personnel (pct) (t-1)	0.0937	0.132
	[-0.0742,0.262]	[-0.0317,0.296]
Involvement in conflict (t-1)	0.410	0.244
	[-0.175,0.994]	[-0.323,0.811]
GDP per capita, FD (t-1)	-0.693	0.173
	[-1.990,0.605]	[-0.861,1.206]
Population, FD (t-1)	-1.044	-1.487
	[-3.039,0.951]	[-3.304,0.330]
Constant	-0.356	0.0709
	[-0.933,0.221]	[-0.569,0.711]
Job security, full model (Conrad) (t-1)	0.830	1.601
	[0.183,1.476]	[0.313,2.889]
Repression severity (t-1), 3 repevent types	0.0533	0.0236
	[0.0234,0.0833]	[-0.0153,0.0624]
Dissent severity (t-1), 3 dissevent types	0.0450	0.0487
	[0.0184,0.0716]	[0.00205,0.0954]
Military personnel (pct) (t-1)	-0.000332	-0.0505
	[-0.187,0.187]	[-0.416,0.315]
Involvement in conflict (t-1)	0.288	1.342
	[-0.447,1.023]	[0.810,1.874]
GDP per capita, FD (t-1)	0.369	-0.146
	[-1.369,2.108]	[-2.505,2.214]
Population, FD (t-1)	3.906	3.042
	[1.842,5.971]	[-1.266,7.350]
Constant	6.742	5.694
	[6.176,7.307]	[4.648,6.739]
sigma		
Constant	1.421	1.891
	[1.349,1.493]	[1.808,1.975]
Observations	1697	1697

95% confidence intervals in brackets

Table 6: Estimated empirical models replacing the Conrad and Ritter (2013) indicator of *Job Security* with that created by Young (2008). His indicator has been inverted to represent security rather than insecurity.

	(1) Repression	(2) Dissent
Job Security (t-1)	-0.402	-0.154
(Young estimates)	[-0.568,-0.236]	[-0.298,-0.00971]
Repression onset (t-1), 3 repevent types	0.887	0.802
	[0.692,1.083]	[0.637,0.966]
Dissent onset (t-1), 3 dissevent types	0.725	0.811
	[0.552,0.898]	[0.645,0.978]
Military personnel (pct) (t-1)	0.0752	0.0862
	[-0.0743,0.225]	[-0.0675,0.240]
Involvement in conflict (t-1)	0.501	-0.00441
	[-0.00459,1.007]	[-0.578,0.569]
GDP per capita, FD (t-1)	-0.633	-0.0596
	[-1.979,0.714]	[-1.263,1.144]
Population, FD (t-1)	-0.297	-1.609
	[-2.053,1.459]	[-3.575,0.357]
Constant	-0.334	-0.641
	[-0.582,-0.0874]	[-0.862,-0.420]
Job Security (t-1)	0.317	0.356
(Young estimates)	[0.230,0.403]	[0.205,0.506]
Repression severity (t-1), 3 repevent types	0.0505	0.0330
	[0.0184,0.0826]	[-0.00914,0.0752]
Dissent severity (t-1), 3 dissevent types	0.0436	0.0575
	[0.0137,0.0736]	[0.00403,0.111]
Military personnel (pct) (t-1)	0.0254	-0.0867
	[-0.154,0.205]	[-0.459,0.285]
Involvement in conflict (t-1)	0.299	1.405
	[-0.500,1.098]	[0.797,2.014]
GDP per capita, FD (t-1)	-0.443	0.362
	[-2.119,1.233]	[-2.577,3.302]
Population, FD (t-1)	3.409	2.991
	[1.422,5.396]	[-1.671,7.653]
Constant	7.094	6.435
	[6.815,7.374]	[6.020,6.851]
sigma		
Constant	1.393	1.885
	[1.316,1.470]	[1.798,1.972]
Observations	1420	1420

95% confidence intervals in brackets

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