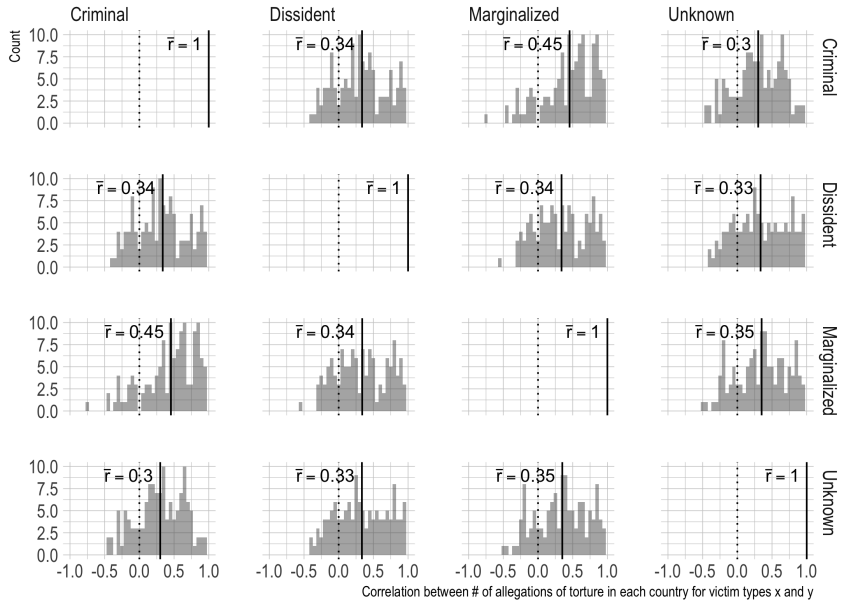
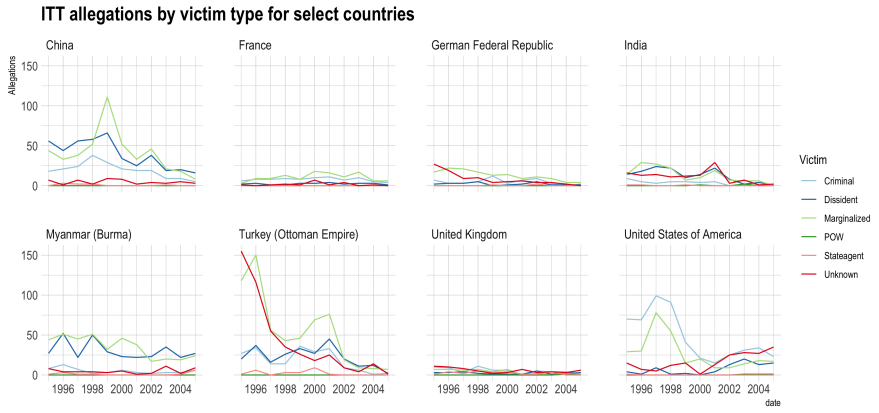
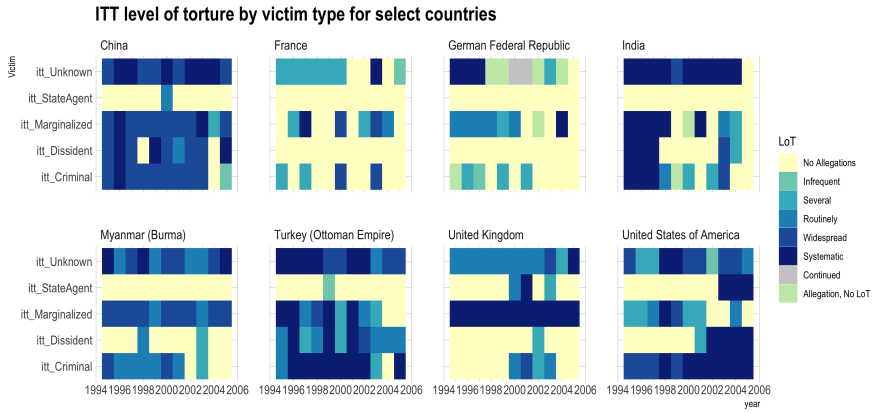


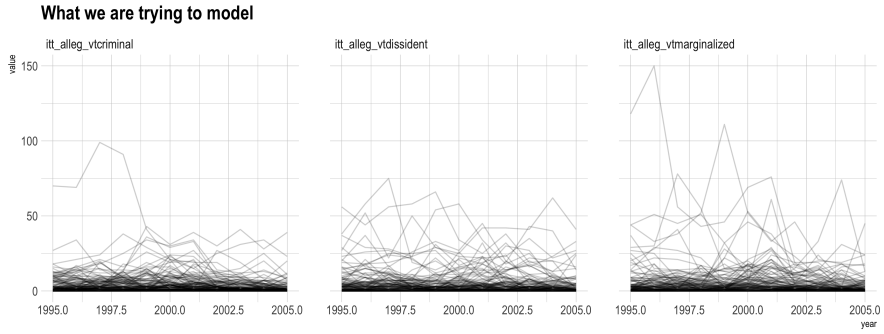
The core models are Poisson mixed effects regression models with state intercepts and three control variables: total population, total GDP, and the ITT restricted access for INGOs indicator. Population and GDP are both logged and then normalized to mean 0 and standard deviation 1. To this basic model we then add each of the variables of interest, one at a time.

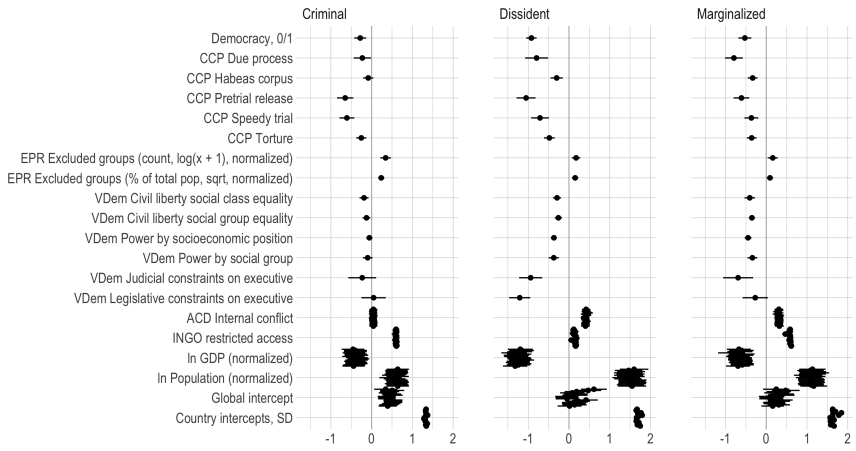
$$\begin{aligned}\ln(\hat{Y}_i) =& \alpha_0 + \alpha_c + \beta_1 \ln \text{Population} + \beta_2 \ln \text{GDP} + \beta_3 \text{Internal conflict} \\ &+ \beta_4 \text{ITT\_restricted\_access} + \beta_4 x_j\end{aligned}$$

Here i indexes the three outcomes, c states, and j each of the variables of interest. The control model excludes the last term. Population and GDP are logged and then normalized to mean 0 and variance 1. The EPR variables for excluded groups count are transformed with $\ln(x+1)$ and square root, respectively, before being normalized. All remaining variables are binary indicators. The reason for the transformations and normalization is to aid with model convergence, especially since many of the binary variables do not change much within countries, which makes fitting country random effects difficult.


ITT allegations by victim type for select countries
China
France
German Federal Republic
India
Myanmar (Burma)
Turkey (Ottoman Empire)
United Kingdom
United States of America
Allegations
0
50
100
150
1996 1998 2000 2002 2004
date
Victim
Criminal
Dissident
Marginalized
POW
Stateagent
Unknown


ITT level of torture by victim type for select countries
China
France
German Federal Republic
India
Myanmar (Burma)
Turkey (Ottoman Empire)
United Kingdom
United States of America
Victim
itt_Unknown
itt_StateAgent
itt_Marginalized
itt_Dissident
itt_Criminal
1994 1996 1998 2000 2002 2004 2006
year
LoT
No Allegations
Infrequent
Several
Routinely
Widespread
Systematic
Continued
Allegation, No LoT


What we are trying to model
itt_alleg_vtcriminal
itt_alleg_vtdissident
itt_alleg_vtmarginalized
value
0
50
100
150
1995.0 1997.5 2000.0 2002.5 2005.0
year

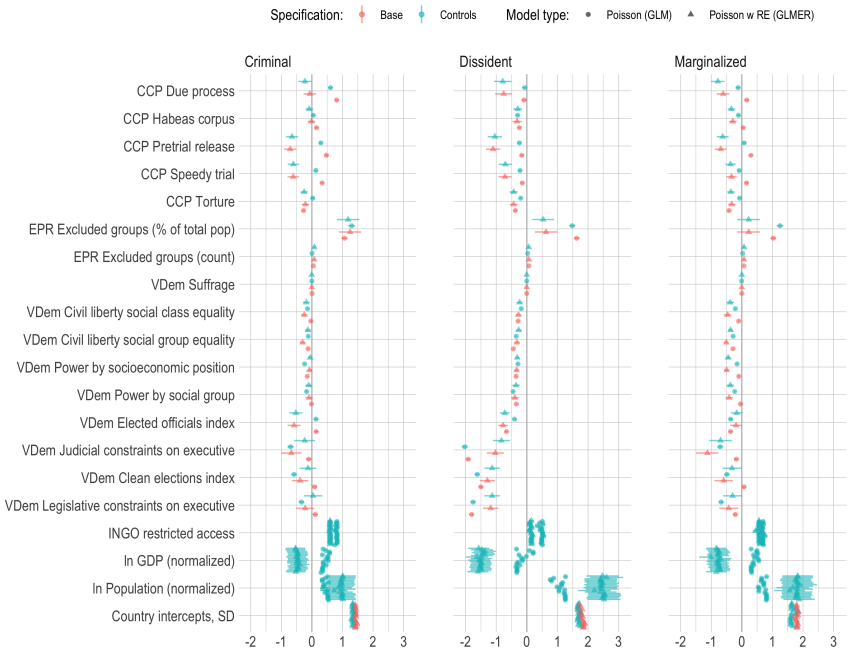


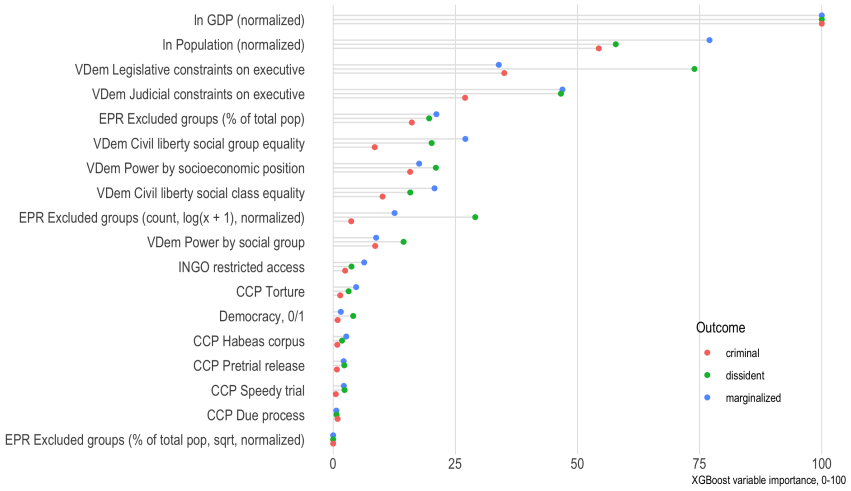
We include country random effects because average levels of allegations are related to factors, including wealth/GDP and levels of democracy, that are also related to our variables of interest. Democracies for example seem to face, on average, higher levels of allegations than similar non-democracies, but to us this appears to be a matter of either higher expectations and/or higher transparency and press freedom, not a higher underlying level of ill-treatment and torture.

Hyperparamaters for the `xgboost` model were picked from a random initial set of hyperparemeters to minimize out-of-sample mean absolute error, based on 11-fold cross-validation.

0.1 Variable importance

The xgboost tree model includes a method for calculating variable importance that is based on calculating the total increase in accuracy produced by a given variable at each tree node in which it is included citepchen2016xgboost. Alternative methods exist, e.g. by measuring accuracy losses when randomly permuting a variable. The resulting measure is relative, i.e. how much of a role a variable plays in explaining the overall predictive accuracy of a model, compared to all other variables that were or could have been included. Here it is rescaled so that the most important variable has an importance value of 100, and those which played no role a


Specification:
Base
Controls
Model type:
Poisson (GLM)
Poisson w RE (GLMER)
Criminal
Dissident
Marginalized
CCP Due process
CCP Habeas corpus
CCP Pretrial release
CCP Speedy trial
CCP Torture
EPR Excluded groups (% of total pop)
EPR Excluded groups (count)
VDem Suffrage
VDem Civil liberty social class equality
VDem Civil liberty social group equality
VDem Power by socioeconomic position
VDem Power by social group
VDem Elected officials index
VDem Judicial constraints on executive
VDem Clean elections index
VDem Legislative constraints on executive
INGO restricted access
ln GDP (normalized)
ln Population (normalized)
Country intercepts, SD
-2
-1
0
1
2
3



value of 0.

Fit statistics:

To compare the relative fit of the core models and xgboost, we used cross-validation to obtain out-of-sample predictions from each set of models, and then calculated three fit statistics:

The mean absolute error (MAE) and root mean squared error (RMSE) are based on the absolute and squared deviations of a point prediction from the target value. Both are in the same units as the outcome variables, i.e. allegation counts, and for both lower values indicate better predictive performance. The RMSE penalizes large prediction errors more than the MAE does, i.e. with target value and predicted value pairs of ([10, 11], [100, 110]) where both predicted values are 10% too high, the MAE gives penalties of 1 and 10, while the RMSE penalizes with 1 and 100.

The continuous rank probability score (CRPS) evaluates a probabilistic forecast density by comparing it's cumulative distribution function to that of the target value. For discrete forecasts it reduces to the mean absolute error, and it thus has a similar interpretation. Its units are the same as the outcome variable, i.e. allegation counts, and lower values indicate better fit. For the probabilistic predictions that we have here, the CRPS, unlike MAE and RMSE, scores the complete forecast density, and not just the quality of the point forecast.

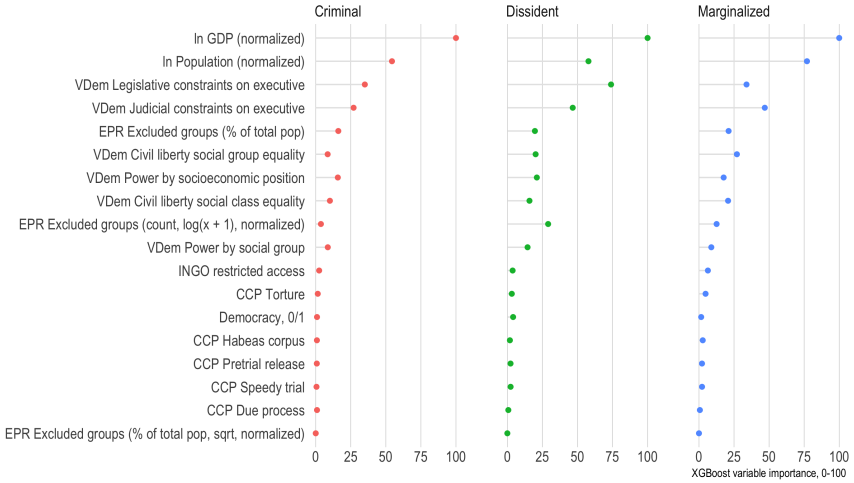


Figure 1: Model fit comparison.

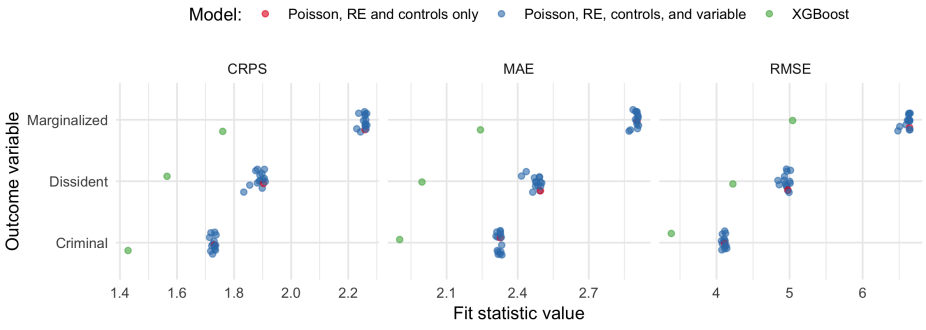


Table 1:

	Dependent variable:						
	Criminal						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CCP Torture		-0.254^{***}					
		(0.063)					
CCP Pretrial release			-0.649^{***}				
			(0.102)				
CCP Habeas corpus				-0.083			
				(0.064)			
CCP Due process					-0.228^{**}		
					(0.108)		
CCP Speedy trial						-0.608^{***}	
						(0.093)	
VDem Judicial constraints on executive							-0.231
							(0.175)
ln GDP (normalized)	-0.448^{***}	-0.411^{***}	-0.374^{***}	-0.427^{***}	-0.443^{***}	-0.379^{***}	-0.398^{***}
	(0.140)	(0.135)	(0.139)	(0.139)	(0.140)	(0.137)	(0.144)
ln Population (normalized)	0.638^{***}	0.631^{***}	0.603^{***}	0.633^{***}	0.642^{***}	0.641^{***}	0.609^{***}
	(0.140)	(0.138)	(0.142)	(0.139)	(0.140)	(0.140)	(0.141)
ACD Internal conflict	0.043	0.041	0.042	0.043	0.043	0.048	0.040
	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)	(0.050)
INGO restricted access	0.599^{***}	0.609^{***}	0.596^{***}	0.605^{***}	0.608^{***}	0.604^{***}	0.594^{***}
	(0.041)	(0.041)	(0.041)	(0.042)	(0.042)	(0.041)	(0.042)
Global intercept	0.372^{***}	0.522^{***}	0.480^{***}	0.424^{***}	0.393^{***}	0.526^{***}	0.504^{***}
	(0.114)	(0.118)	(0.117)	(0.120)	(0.114)	(0.116)	(0.150)
Observations	1,654	1,654	1,654	1,654	1,654	1,654	1,654
Log Likelihood	$-3,834.612$	$-3,826.613$	$-3,813.703$	$-3,833.783$	$-3,832.418$	$-3,811.613$	$-3,833.742$
Akaike Inf. Crit.	7,681.224	7,667.227	7,641.405	7,681.565	7,678.836	7,637.225	7,681.483
Bayesian Inf. Crit.	7,713.690	7,705.104	7,679.282	7,719.442	7,716.713	7,675.102	7,719.360

Note: *p<0.1; **p<0.05; ***p<0.01

Table 2:

	Dependent variable:							
	Criminal							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VDem Legislative constraints on executive	0.047							
	(0.153)							
VDem Civil liberty social class equality		-0.186^{***}						
		(0.057)						
VDem Civil liberty social group equality			-0.127^{***}					
			(0.048)					
VDem Power by socioeconomic position				-0.056				
				(0.040)				
VDem Power by social group					-0.097			
					(0.061)			
norm_sqrt_epr_excluded_group_pop						0.236^{***}		
						(0.039)		
EPR Excluded groups (count, log(x + 1), normalized)							0.343^{***}	
							(0.066)	
dd_democracy								-0.281^{***}
								(0.074)
ln GDP (normalized)	-0.457^{***}	-0.374^{**}	-0.391^{***}	-0.436^{***}	-0.402^{***}	-0.325^{**}	-0.363^{***}	-0.366^{***}
	(0.142)	(0.147)	(0.141)	(0.141)	(0.143)	(0.136)	(0.136)	(0.140)
ln Population (normalized)	0.641^{***}	0.542^{***}	0.595^{***}	0.623^{***}	0.615^{***}	0.564^{***}	0.464^{***}	0.611^{***}
	(0.140)	(0.146)	(0.141)	(0.140)	(0.140)	(0.136)	(0.141)	(0.139)
ACD Internal conflict	0.044	0.049	0.031	0.043	0.031	0.033	0.031	0.036
	(0.050)	(0.050)	(0.050)	(0.050)	(0.051)	(0.050)	(0.050)	(0.050)
INGO restricted access	0.600^{***}	0.600^{***}	0.575^{***}	0.599^{***}	0.603^{***}	0.599^{***}	0.602^{***}	0.580^{***}
	(0.041)	(0.041)	(0.043)	(0.041)	(0.041)	(0.041)	(0.041)	(0.042)
Global intercept	0.344^{**}	0.518^{***}	0.485^{***}	0.399^{***}	0.440^{***}	0.375^{***}	0.373^{***}	0.524^{***}
	(0.144)	(0.125)	(0.121)	(0.115)	(0.121)	(0.109)	(0.110)	(0.119)
Observations	1,654	1,654	1,654	1,654	1,654	1,654	1,654	1,654
Log Likelihood	−3,834.565	−3,829.193	−3,831.180	−3,833.618	−3,833.359	−3,814.756	−3,821.128	−3,827.512
Akaike Inf. Crit.	7,683.129	7,672.385	7,676.361	7,681.236	7,680.718	7,643.512	7,656.257	7,669.023
Bayesian Inf. Crit.	7,721.006	7,710.262	7,714.238	7,719.113	7,718.594	7,681.389	7,694.134	7,706.900

Note: *p<0.1; **p<0.05; ***p<0.01

Table 3:

	Dependent variable:						
	Dissident						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CCP Torture		-0.482^{***}					
		(0.068)					
CCP Pretrial release			-1.052^{***}				
			(0.119)				
CCP Habeas corpus				-0.301^{***}			
				(0.077)			
CCP Due process					-0.795^{***}		
					(0.144)		
CCP Speedy trial						-0.711^{***}	
						(0.110)	
VDem Judicial constraints on executive							-0.940^{***}
							(0.145)
ln GDP (normalized)	-1.296^{***}	-1.242^{***}	-1.215^{***}	-1.239^{***}	-1.321^{***}	-1.257^{***}	-1.163^{***}
	(0.150)	(0.146)	(0.149)	(0.148)	(0.152)	(0.150)	(0.155)
ln Population (normalized)	1.519^{***}	1.549^{***}	1.548^{***}	1.510^{***}	1.551^{***}	1.562^{***}	1.464^{***}
	(0.173)	(0.170)	(0.175)	(0.171)	(0.177)	(0.175)	(0.172)
ACD Internal conflict	0.403^{***}	0.434^{***}	0.407^{***}	0.405^{***}	0.405^{***}	0.407^{***}	0.426^{***}
	(0.053)	(0.053)	(0.053)	(0.053)	(0.053)	(0.054)	(0.053)
INGO restricted access	0.161^{***}	0.156^{***}	0.155^{***}	0.170^{***}	0.163^{***}	0.164^{***}	0.116^{***}
	(0.042)	(0.042)	(0.041)	(0.042)	(0.042)	(0.042)	(0.043)
Global intercept	-0.053	0.227	0.118	0.139	0.015	0.123	0.471^{***}
	(0.147)	(0.147)	(0.149)	(0.152)	(0.151)	(0.150)	(0.164)
Observations	1,654	1,654	1,654	1,654	1,654	1,654	1,654
Log Likelihood	$-3,826.920$	$-3,801.365$	$-3,784.456$	$-3,819.157$	$-3,810.642$	$-3,804.919$	$-3,806.070$
Akaike Inf. Crit.	7,665.840	7,616.730	7,582.912	7,652.315	7,635.284	7,623.838	7,626.140
Bayesian Inf. Crit.	7,698.306	7,654.607	7,620.788	7,690.192	7,673.161	7,661.715	7,664.017

Note: *p<0.1; **p<0.05; ***p<0.01

Table 4:

	Dependent variable:							
	Dissident							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VDem Legislative constraints on executive	-1.209^{***}							
	(0.132)							
VDem Civil liberty social class equality		-0.293^{***}						
		(0.050)						
VDem Civil liberty social group equality			-0.260^{***}					
			(0.046)					
VDem Power by socioeconomic position				-0.370^{***}				
				(0.037)				
VDem Power by social group					-0.374^{***}			
					(0.064)			
norm_sqrt_epr_excluded_group_pop						0.152^{***}		
						(0.039)		
EPR Excluded groups (count, log(x + 1), normalized)							0.175^{***}	
							(0.053)	
dd_democracy								-0.922^{***}
								(0.065)
ln GDP (normalized)	-1.194^{***}	-1.288^{***}	-1.224^{***}	-1.344^{***}	-1.209^{***}	-1.213^{***}	-1.229^{***}	-1.164^{***}
	(0.156)	(0.160)	(0.153)	(0.161)	(0.157)	(0.150)	(0.149)	(0.157)
ln Population (normalized)	1.600^{***}	1.463^{***}	1.511^{***}	1.456^{***}	1.526^{***}	1.450^{***}	1.406^{***}	1.560^{***}
	(0.179)	(0.182)	(0.176)	(0.179)	(0.175)	(0.171)	(0.173)	(0.177)
ACD Internal conflict	0.421^{***}	0.441^{***}	0.393^{***}	0.484^{***}	0.412^{***}	0.400^{***}	0.394^{***}	0.412^{***}
	(0.052)	(0.053)	(0.053)	(0.053)	(0.053)	(0.054)	(0.054)	(0.052)
INGO restricted access	0.117^{***}	0.157^{***}	0.108^{**}	0.103^{**}	0.154^{***}	0.177^{***}	0.178^{***}	0.059
	(0.042)	(0.042)	(0.043)	(0.043)	(0.042)	(0.042)	(0.042)	(0.043)
Global intercept	0.613^{***}	0.147	0.165	0.082	0.185	-0.047	-0.043	0.418^{***}
	(0.161)	(0.158)	(0.151)	(0.153)	(0.150)	(0.143)	(0.143)	(0.147)
Observations	1,654	1,654	1,654	1,654	1,654	1,654	1,654	1,654
Log Likelihood	$-3,785.559$	$-3,810.205$	$-3,810.608$	$-3,776.132$	$-3,809.927$	$-3,819.385$	$-3,821.503$	$-3,723.402$
Akaike Inf. Crit.	7,585.119	7,634.409	7,635.215	7,566.263	7,633.854	7,652.770	7,657.006	7,460.804
Bayesian Inf. Crit.	7,622.995	7,672.286	7,673.092	7,604.140	7,671.730	7,690.647	7,694.883	7,498.681

Note: *p<0.1; **p<0.05; ***p<0.01

Table 5:

	Dependent variable:						
	Marginalized						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
CCP Torture		-0.358^{***}					
		(0.061)					
CCP Pretrial release			-0.610^{***}				
			(0.098)				
CCP Habeas corpus				-0.335^{***}			
				(0.061)			
CCP Due process					-0.795^{***}		
					(0.111)		
CCP Speedy trial						-0.367^{***}	
						(0.086)	
VDem Judicial constraints on executive							-0.692^{***}
							(0.188)
ln GDP (normalized)	-0.695^{***}	-0.612^{***}	-0.592^{***}	-0.590^{***}	-0.695^{***}	-0.634^{***}	-0.610^{***}
	(0.149)	(0.143)	(0.146)	(0.144)	(0.149)	(0.147)	(0.154)
ln Population (normalized)	1.132^{***}	1.105^{***}	1.092^{***}	1.100^{***}	1.164^{***}	1.126^{***}	1.086^{***}
	(0.164)	(0.160)	(0.162)	(0.161)	(0.168)	(0.162)	(0.166)
ACD Internal conflict	0.313^{***}	0.312^{***}	0.303^{***}	0.308^{***}	0.321^{***}	0.313^{***}	0.310^{***}
	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)
INGO restricted access	0.585^{***}	0.599^{***}	0.584^{***}	0.604^{***}	0.612^{***}	0.594^{***}	0.575^{***}
	(0.038)	(0.038)	(0.038)	(0.039)	(0.039)	(0.038)	(0.039)
Global intercept	0.092	0.310^{**}	0.204	0.307^{**}	0.157	0.192	0.477^{***}
	(0.139)	(0.140)	(0.139)	(0.141)	(0.143)	(0.139)	(0.174)
Observations	1,654	1,654	1,654	1,654	1,654	1,654	1,654
Log Likelihood	$-4{,}187.693$	$-4{,}170.539$	$-4{,}167.731$	$-4{,}172.666$	$-4{,}161.722$	$-4{,}178.291$	$-4{,}180.898$
Akaike Inf. Crit.	8,387.386	8,355.078	8,349.461	8,359.332	8,337.445	8,370.581	8,375.796
Bayesian Inf. Crit.	8,419.852	8,392.955	8,387.338	8,397.208	8,375.321	8,408.458	8,413.673

Note: *p<0.1; **p<0.05; ***p<0.01

Table 6:

	Dependent variable:							
	Marginalized							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VDem Legislative constraints on executive	-0.271^{*}							
	(0.158)							
VDem Civil liberty social class equality		-0.406^{***}						
		(0.065)						
VDem Civil liberty social group equality			-0.352^{***}					
			(0.039)					
VDem Power by socioeconomic position				-0.447^{***}				
				(0.044)				
VDem Power by social group					-0.341^{***}			
					(0.062)			
norm_sqrt_epr_excluded_group_pop						0.091^{**}		
						(0.040)		
EPR Excluded groups (count, log(x + 1), normalized)							0.158^{**}	
							(0.063)	
dd_democracy								-0.526^{***}
								(0.081)
ln GDP (normalized)	-0.672^{***}	-0.635^{***}	-0.586^{***}	-0.854^{***}	-0.650^{***}	-0.647^{***}	-0.642^{***}	-0.635^{***}
	(0.150)	(0.162)	(0.152)	(0.168)	(0.157)	(0.149)	(0.148)	(0.153)
ln Population (normalized)	1.134^{***}	1.027^{***}	1.131^{***}	1.182^{***}	1.132^{***}	1.101^{***}	1.046^{***}	1.110^{***}
	(0.165)	(0.178)	(0.169)	(0.183)	(0.172)	(0.163)	(0.164)	(0.168)
ACD Internal conflict	0.309^{***}	0.331^{***}	0.265^{***}	0.314^{***}	0.276^{***}	0.310^{***}	0.308^{***}	0.319^{***}
	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)	(0.055)
INGO restricted access	0.584^{***}	0.584^{***}	0.469^{***}	0.539^{***}	0.583^{***}	0.588^{***}	0.589^{***}	0.563^{***}
	(0.039)	(0.039)	(0.041)	(0.039)	(0.039)	(0.038)	(0.038)	(0.039)
Global intercept	0.244	0.384^{**}	0.398^{***}	0.258	0.312^{**}	0.096	0.101	0.357^{**}
	(0.166)	(0.159)	(0.144)	(0.158)	(0.150)	(0.137)	(0.135)	(0.148)
Observations	1,654	1,654	1,654	1,654	1,654	1,654	1,654	1,654
Log Likelihood	−4,186.239	−4,167.826	−4,145.191	−4,132.196	−4,171.851	−4,185.124	−4,184.594	−4,166.536
Akaike Inf. Crit.	8,386.479	8,349.652	8,304.382	8,278.392	8,357.702	8,384.248	8,383.189	8,347.072
Bayesian Inf. Crit.	8,424.355	8,387.529	8,342.258	8,316.269	8,395.579	8,422.125	8,421.066	8,384.948

Note: *p<0.1; **p<0.05; ***p<0.01