

# *Transnational Dimensions of Civil War*

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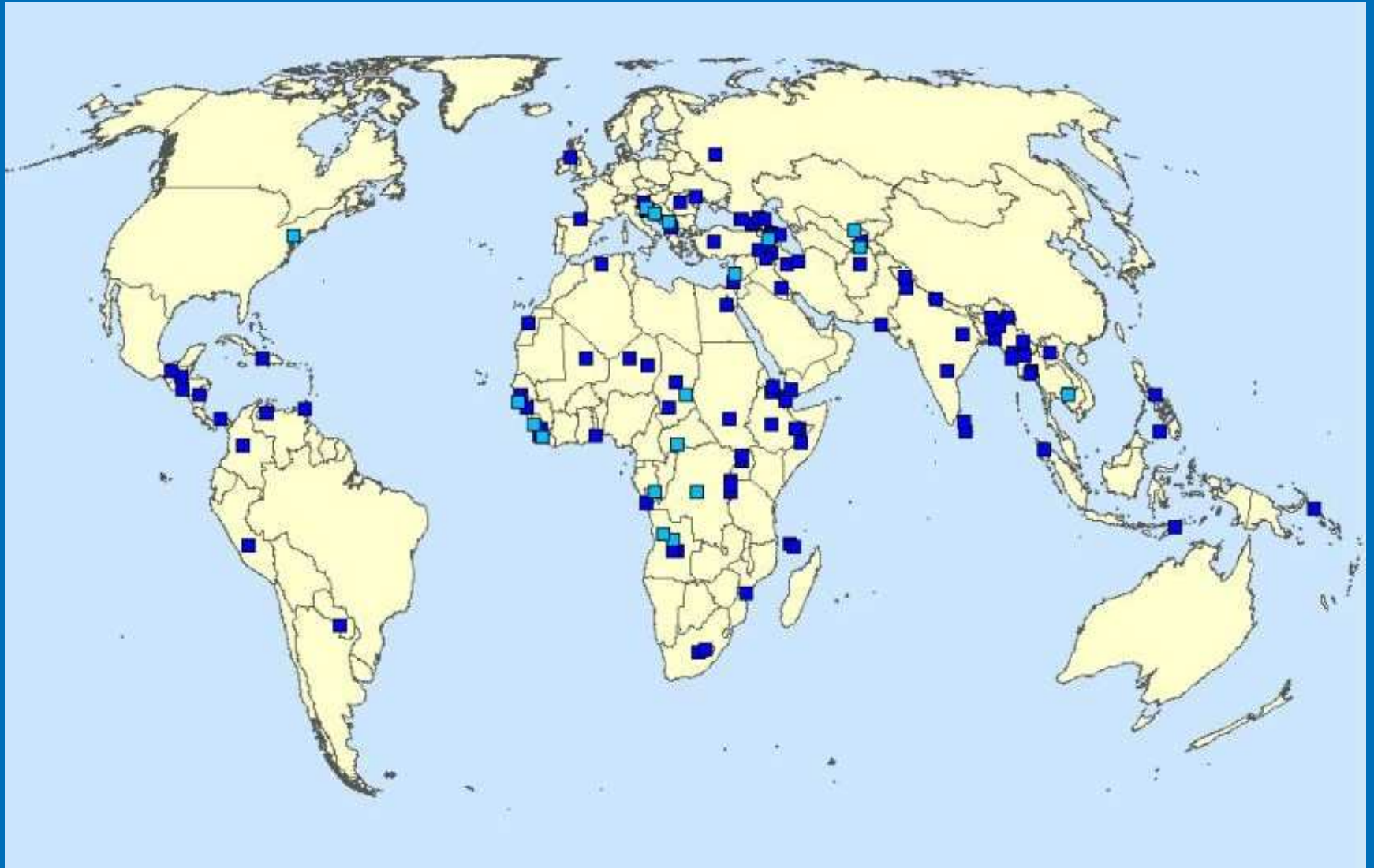
# *Transnational conflict*

- Most conflicts in contemporary world *intrastate* conflicts between state and non-state actors rather than *interstate*
- But many “civil” wars not confined within nation states, display transnational dimensions
  - Actors themselves often transnational, e.g., Albanian insurgents
  - States may intervene, provide support (e.g., Congo), anticipation of support may influence mobilization (e.g., Kosovo)
  - Conflicts in one state may create externalities that increase risk of war in another state
  - Many efforts treat interstate and civil wars as mutually exclusive categories but in practice difficult to classify many conflicts (Bosnia — formally civil war, yet clear ties to neighboring states and ethnic kin; Kashmir — role of Pakistan)
  - New armed conflicts after 2000 in Uppsala data all intrastate, but clear transnational elements:  
Albanian revolt in Macedonia; RFDG rebels in Guinea; September 11 attacks

## *Transnational conflict*

- Existing studies of civil war focus on country characteristics and treat conflicts as independent, domestic phenomena
- Problematic if transnational factors influence risk of civil war and we have dependence between observations
- Broader project on regional conflict dynamics, three key assumptions
  - 1. States/dyads not self-contained or independent, but influenced by relations with other actors
  - 2. Transnational factors influence risk of conflict, and cannot be reduced to attributes of individual countries
  - 3. Regional component: Most interesting dependence is local and not system wide

# *Civil conflict, 1989-2001*



## *Transnational dimensions of civil war*

- Previous research demonstrates geographical clustering in civil wars (e.g., Gleditsch 2002, Ward and Gleditsch 2002)
  - Yet, know less about *how* external factors influence civil war onset and conflict dynamics
- Distinguish between possible sources of geographical patterns
  - Direct conflict spill-over and contagion
  - Hypotheses on specific transnational linkages
- Develop adequate statistical models of transnational linkages
- Consider the reverse Galton problem in many diffusion studies
  - Geographical clustering may stem from other spatially clustered domestic attributes (e.g., wealth, institutions), must also consider central country-specific factors known to be associated with conflict

# *Transnational dimensions of civil war*

- Conflict contagion/diffusion
  - Increase in risk when connected states are at war
- Hypotheses on transnational linkages that may underlie geographical clustering
  - Transborder ethnic ties
  - Institutions in connected states
  - Integration/trade between states in region
- Country-specific attributes
  - Institutions
  - GDP per capita (“state strength”)
  - Ethnic heterogeneity

## *Specifying dependence between observations*

- Assume that local actors and attributes most relevant
- Dependence takes form of a locally dependent Markov field
  - Conditional probability of  $x_i$  given  $x_j$ ,  $Pr(x_i|x_j, j \neq i)$ , depends only on  $x_j$  if unit  $j$  is a neighbor of  $i$
  - (Spatial) dependence can be specified by a graph of relations between actors, or connectivity matrix  $\mathbf{W}$
  - States  $i$  and  $j$  connected ( $w_{ij} = 1$ ) if within minimum distance threshold, row  $w_i$  specifies  $i$ 's connectivities to all other states  $J$
- Allows introducing dependence in statistical model
- Create spatial variable that reflect regional attributes or transnational linkages based on  $\mathbf{W}$

# Statistical model of spatial process

- Spatial econometrics (e.g., Anselin 1988)
  - Introduce spatial context by r.h.s. lag or error based on  $\mathbb{W}$  (SAR/SER maximum likelihood estimators). Presumes a continuous d.v., but conflict is a categorical d.v.
- Autologistic model of spatial processes (Besag 1974)
  - Probability of conflict in  $i$  conditional on peace/war in connected states  $j$ , given by  $r_{i,t}^c = [w_{(i,\cdot)} \times y_t^c] \#$
  - Covariates: country  $X_{i,t}$ , transnational  $Z_{i,t}$ , time dependence  $py_{i,t-1}$

$$Pr(y_{i,t} = 1) = \frac{e^{\eta_i}}{1 + e^{\eta_i}}, \text{ where } \eta_i = \gamma r_{i,t}^c + \mathbf{X}_{i,t}\beta + \mathbf{Z}_{i,t}\lambda + \phi_1 F(py_{i,t-1})$$

- Conceptually similar to logit model (case where  $\gamma = 0$ )

## *Model estimation*

- Difficult likelihood function (since the  $y_i$  conditional on one another), but can be approximated by MCMC methods
- A map from an autologistic model can be defined by the model parameters  $\theta$  and the sufficient statistics  $s(y)$  for  $y$
- 1. Find initial estimates  $\psi$  (maximum pseudolikelihood, MPL)
- 2. Based on initial values  $\psi$ , run Gibbs sampler to simulate  $m$  maps of  $y_i$  and derive sufficient statistics from these samples
- 3. Approximate MLE  $\theta$  by solving score equation by Newton-Raphson

$$\frac{\sum_{j=1}^m s(y_m) e^{(\hat{\theta} - \psi)' s(y_m)}}{\sum_{j=1}^m e^{(\hat{\theta} - \psi)' s(y_m)}} = s(y)$$

## *Data, sample, measures*

- Previous studies single year, broader sample 1946-2001
- New PRIO/Uppsala conflict data with lower threshold (25+ deaths)
- Transnational variables
  - Regional Polity mean, count of transborder groups (MAR), volume of local trade (expanded IMF)
- Country-specific variables
  - Polity (linear, u-curve), ethnic heterogeneity (Vanhanen)
- Control for time dependence
  - Exponential decay of time at peace at  $t - 1$

# Estimates for autologistic model

Covariate	MCMC estimates		Logit estimates	
	Coefficient estimate	Standard error	Coefficient estimate	Standard error
(Intercept)	-4.321	0.441	-3.360	0.437
Conflict history ( $\phi$ )	4.710	0.144	4.750	0.149
Democracy ( $\beta_1$ )	0.007	0.007	-0.005	0.007
Ethnic dispersion ( $\beta_2$ )	0.009	0.003	0.011	0.003
Ln GDP per capita ( $\beta_3$ )	-0.024	0.057	-0.152	0.053
Population ( $\beta_4$ )	0.001	<0.001	0.002	<0.001
Regional democracy ( $\lambda_1$ )	-0.033	0.015	—	—
Transborder groups ( $\lambda_2$ )	0.039	0.012	—	—
Regional trade ( $\lambda_3$ )	-1.928	0.683	—	—
Adjacent conflict ( $\gamma$ )	0.313	0.105	—	—

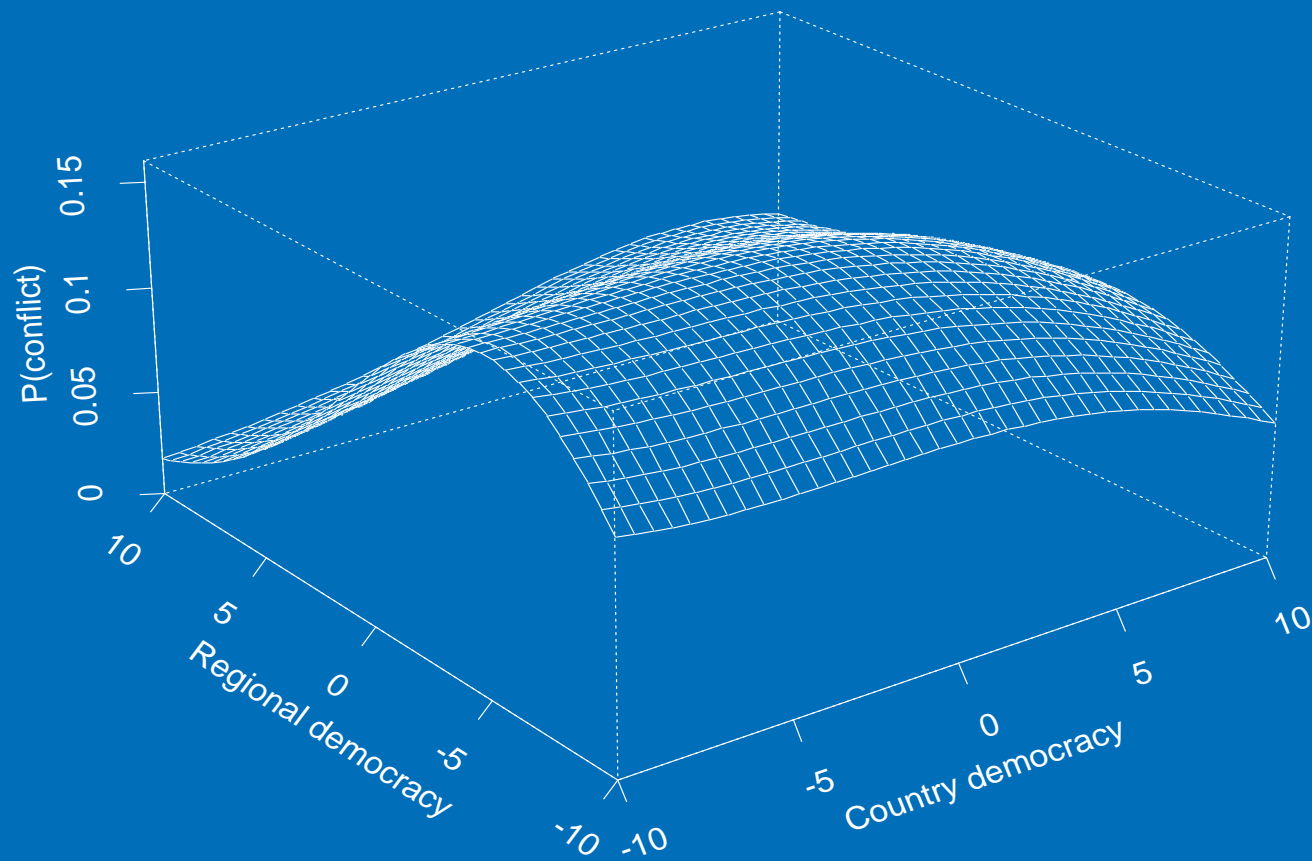
Model fit (MCMC estimates)

N = 5070, LR- $\chi^2$  = 2457.8, df=9

# *Substantive implications of results*

- Political factors
  - More democratic regions are less prone to conflict, but country-specific democracy not clear effect by itself
  - (Alternative specifications no evidence for inverted u-curve, only if transition codes recoded as midpoint)
- Ethnic factors
  - Conflict more likely the greater the population not in the dominant group
  - Conflict also more likely the higher the number of transborder ethnic groups
- Economic factors
  - Ln GDP per capita small impact, not consistent
  - But large effect of trade with other countries in region
  - Conflict unlikely in more integrated regions, may also proxy for developed/state capacity

# *Conflict by democracy and regional democracy*



## *Fearon & Laitin Model*

Adding transnational factors to model in Fearon, JD & D Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97:75-90.

Time dep.	3.449	(0.170)	Local trade	-0.029	(0.013)
GDP per capita	-0.071	(0.029)	Contig. groups.	0.020	(0.017)
Ln population	0.250	(0.057)	Regional dem.	-0.041	(0.017)
Ln % mount. terr.	0.115	(0.052)	Adjacent conf.	0.539	(0.152)
Island	0.111	(0.189)			
Oil	0.369	(0.185)			
New state	-1.261	(0.310)			
Instability	0.160	(0.152)			
Polity	0.018	(0.011)			
Ethnic frac.	0.679	(0.304)			
Religious frac.	0.114	(0.331)			
Intercept	-7.331	(0.530)			

## *Contribution of transnational factors*

- Conflict history clearly matters a great deal
- Does model do well only because of time or do transnational factors make substantial contribution?
- Evaluate contribution of transnational covariates plus contagion term by Bayes factors, or ratio of posterior probabilities given data
  - $M_1$ : Logit without transnational factors,  $M_2$ : Autologistic model estimated by MCMC
  - Raftery (1995) proposes approximating the Bayes factor for some model  $M_k$  through Bayesian Information Criterion (BIC):

$$BIC'_k = -\chi_{k0}^2 + p_k \ln(n)$$

- $BIC'_{M_1} = -4691.73$ ;  $BIC'_{M_2} = -4852.032$
- Bayes factor approximation is  $BIC'_{M_1} - BIC'_{M_2} = 160.302$
- Well above  $> 10$ , Raftery's threshold for "strong evidence" for  $M_2$  over  $M_1$

## MCMC and MPL estimates

Covariate	MPL estimates		MCMC estimates	
	Coefficient estimate	Standard error	Coefficient estimate	Standard error
(Intercept)	-4.8270	0.5669	-4.3212	0.4411
Conflict history ( $\phi$ )	4.6750	0.1611	4.7101	0.1443
Democracy ( $\beta_1$ )	0.0105	0.0090	0.0068	0.0074
Ethnic dispersion ( $\beta_2$ )	0.0083	0.0037	0.0088	0.0031
ln GDP per capita ( $\beta_3$ )	-0.0065	0.0665	-0.0243	0.0570
Population ( $\beta_4$ )	0.0008	0.0004	0.0009	0.0004
Regional democracy ( $\lambda_1$ )	-0.0279	0.0162	-0.0333	0.0147
Transborder groups ( $\lambda_2$ )	0.0359	0.0147	0.0393	0.0115
Regional trade ( $\lambda_3$ )	-1.828	0.7059	-1.928	0.683
Adjacent conflict ( $\gamma$ )	0.8512	0.1680	0.3131	0.1054

Model fit (MCMC estimates)

N = 5070

LR- $\chi^2$  = 2457.8, df=9

## *Model classification*

	MPL		MCMC	
	Predicted		Predicted	
Observed	No	Yes	No	Yes
No	3685	272	3680	277
Yes	227	886	201	912

- MCMC estimates better than MPL
- Out of sample prediction to 2000 conflict data based on 1946-99 parameters and 1999 data (condition on *predicted* conflicts in 1999) identifies 89% obs. correctly
- Regional factors appear to reflect persistent features, not simply fit to idiosyncracies of sample

## *Implications and conclusions*

- Transnational linkages exert important influences on civil wars
- Regional covariates at least as important as country attributes emphasized in other work
- Good and bad neighborhoods, differences in risk of conflict cannot be reduced to country-specific attributes
- Extensions
  - New more specific data on external linkages and non-state actors, expanding Uppsala data
  - Analyses of interaction processes in regional conflicts
  - Geo-coded conflict and ethnicity data
  - How civil conflicts influence relations between states
  - Network characteristics
  - Agent based modeling/simulation