

# How big wars become small(er) wars: latent dynamics of conflict and the role of peacekeeping

Gudmund Horn Hermansen<sup>1</sup>  
Håvard Mogleiv Nygård<sup>2</sup>

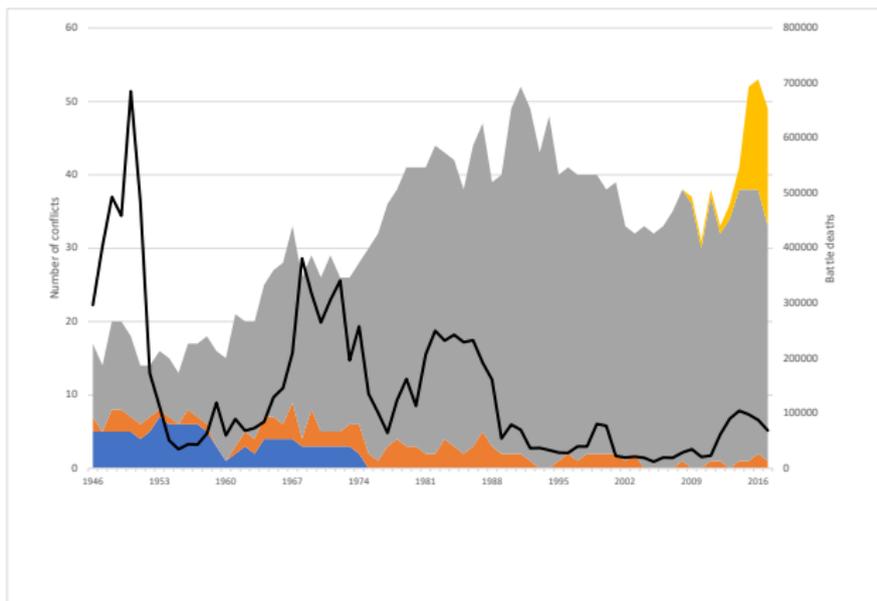
<sup>1</sup>Department of Economics, Norwegian Business School  
<sup>2</sup>Peace Research Institute Oslo

May 25, 2018

Vårens Vakreste Variabler, Oslo, May 2018

# The scourge of war is still very much with us

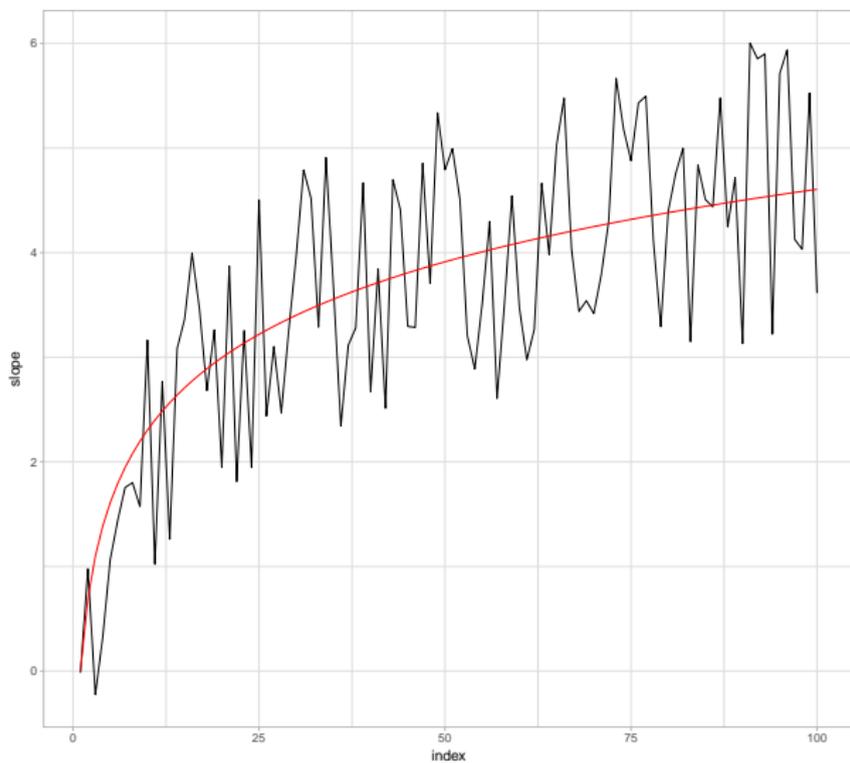
Trends in the number of armed conflicts and the number of battle deaths, globally, 1946–2017



## Larger project: understanding conflict escalation

- ▶ Conflict research has spent the last 20 years doing systematic, largely statistical, studies to understand why civil wars break out, how they are sustained, and when and how durable post-conflict peace is possible
- ▶ Much less energy has been spent understanding the *dynamics* of conflict
- ▶ We plan to study the process(es) of escalation (and de-escalation) in conflict
- ▶ Current state-of-the-art: modelling differences between smaller and bigger wars (markov models)
- ▶ Aim to understand why and when non-violent conflicts become violent and when low intensity conflict becomes high intensity
- ▶ The literature predominately relies on off-the-shelf statistical models, we want to invest more in modelling the underlying data-generating process

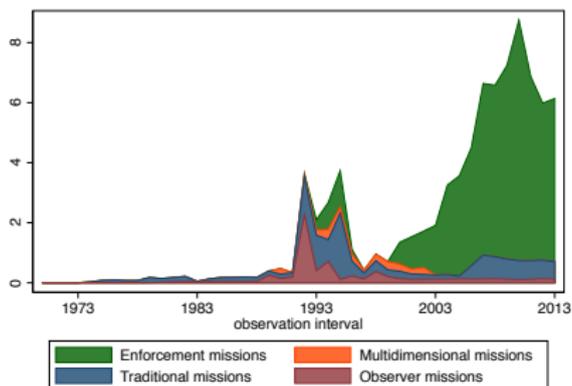
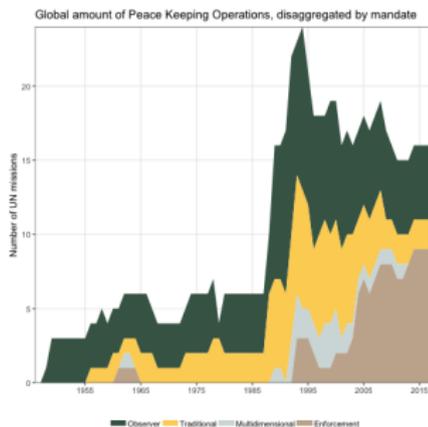
# Latent and observed intensity in conflict



# Conflict escalation and UN peacekeeping

- ▶ Here we focus more specifically on how UN peacekeeping affects conflict intensity and processes of escalation

Number and budget of UN PKO missions by mandate type, 1970–2017(/13)



PKO classification from Doyle & Sambanis 2000. Figures in billion US dollars.

# Winning the war on war: the role of UN peacekeeping

- ▶ U.N.'s almost *unrelieved record of failure* in its peacekeeping missions (Max Boot, Foreign Affairs, 2000)
- ▶ 2000 Brahimi rapport: the missions of the past decade would be particularly hard to accomplish
- ▶ 2015 High-level panel: 'We must take stock of evolving expectations and consider how the UN can advance peace'



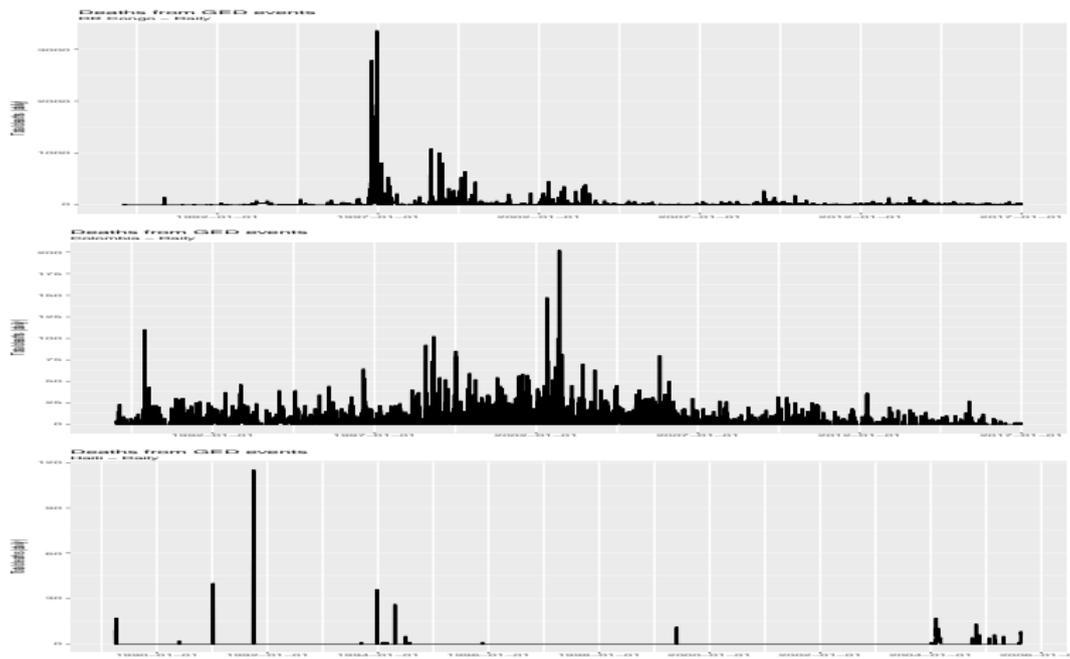
# Does peacekeeping work? The academic view

- ▶ Several studies find beneficial effects of PKOs along *one* of these pathways:
  1. PKO deployment reduces the amount of violence against civilians during conflict
  2. increases the chances of conflict ending
  3. reduces the risk of conflict recurrence a few years after a war has ended
  4. and PKOs limit the risk of onset of conflict in neighboring countries
- ▶ But: we still lack systematic understanding of how PKOs affect the *conflict process*
- ▶ We differentiate between the (stochastic) latent **intensity** of a conflict and the **escalatory** dynamics of the conflict
- ▶ Study if PKOs affect either of these, possibly, distinct processes

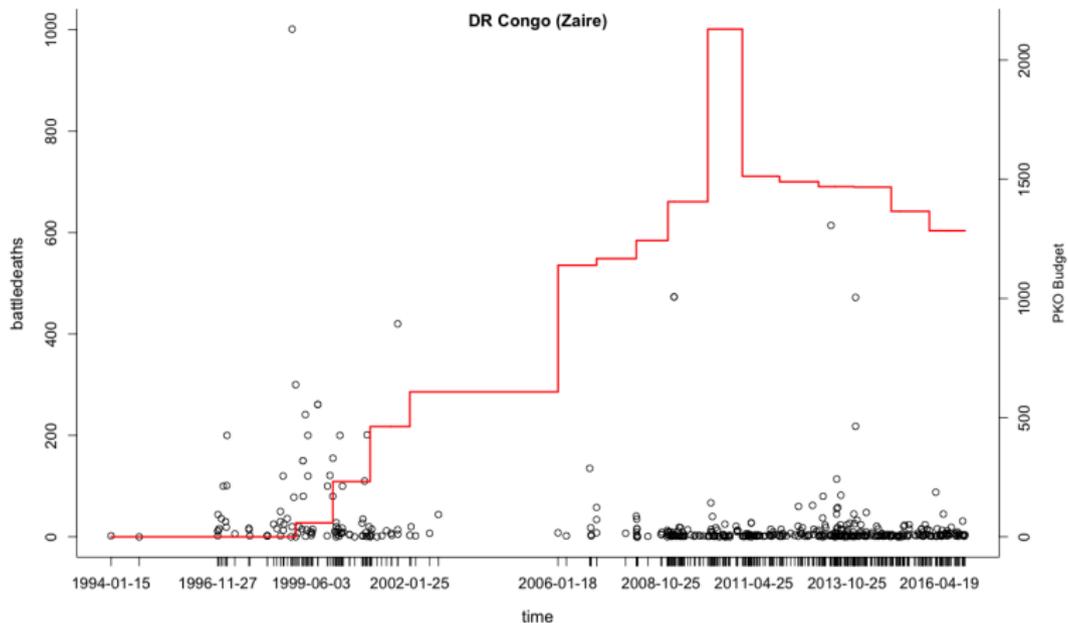
# Intensity *and* escalation

- ▶ We want to understand how PKOs affect the conflict process
- ▶ To do this, **we need a better model of the conflict process**
- ▶ Conflicts are not smooth continuous processes
- ▶ Considerable *day-to-day* variation in violence – but tendencies towards periods
- ▶ We separate between *intensity* and *escalation*
  1. **Intensity**: a latent stochastic process that produces spikes and lulls in the conflict process
  2. **Escalation**: actually hard to describe... we think of it as the change from a few isolated spikes to a cluster of spikes - a hill or a mountain (a fairly obvious change point angle here that we're not pursuing in this)
- ▶ Do PKOs, if they have an effect, affect the (underlying) **intensity** or **escalation**?

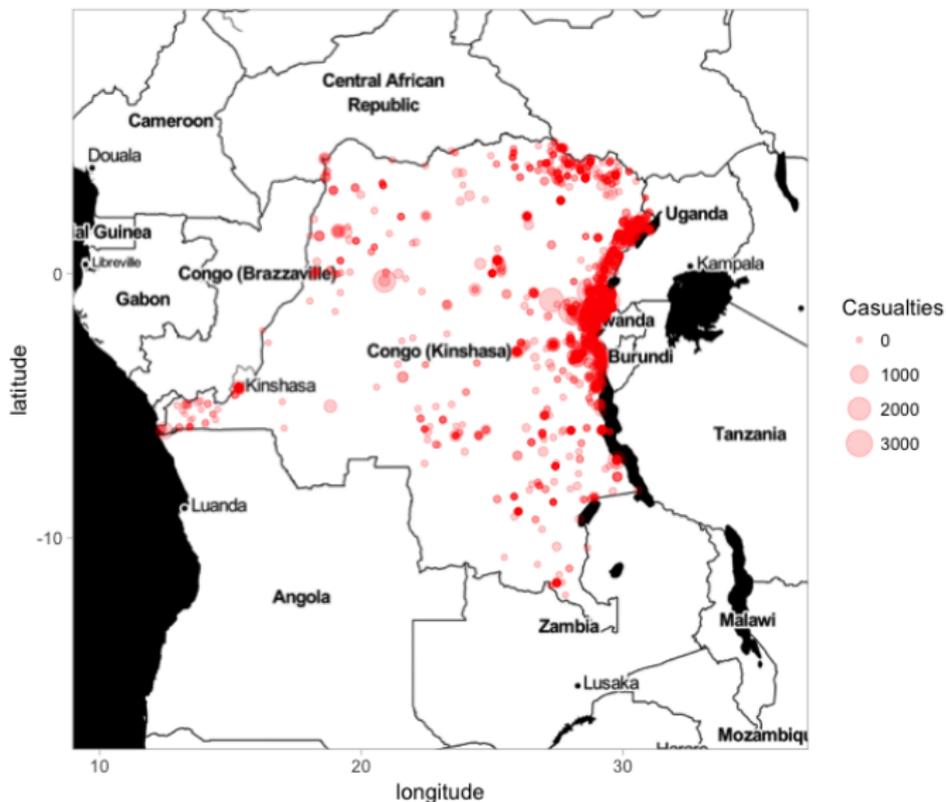
# The *process* of conflict: daily number of battle deaths, DRC, Colombia, and Haiti, 1989–2017



# Conflict and PKOs in the Congo



# But note: time vs. geography



# The conflict process

- ▶ We are interested in drawing conclusions and learning about the **latent conflict process**
- ▶ This latent process is unobserved, we observe *battle deaths* over time
- ▶ The background process, **the underlying intensity** driving the number of battle deaths, may be continuous but we only observe it when it crosses a threshold and leads to at least one battle death
- ▶ Attempt to build a plausible model for the background process with the observed battle deaths data
- ▶ This model needs to be able to capture and re-create the **stochastic intensity**, with its spikes and lulls, and **escalation** that appears to change the **intensity**
- ▶ The possibility of **escalation** means the background process may not be temporally homogeneous

# From conflict processes to a model of conflict

- ▶ Focus is on the count of daily (or weekly) battle deaths ( $Y_t$ ).

$$Y_t \sim \text{Poisson}(\theta_t) \quad (1)$$

$$\theta_t | y_{t-1} \sim \text{Gamma}(c \cdot (\alpha + \beta y_{t-1}), c) \quad (2)$$

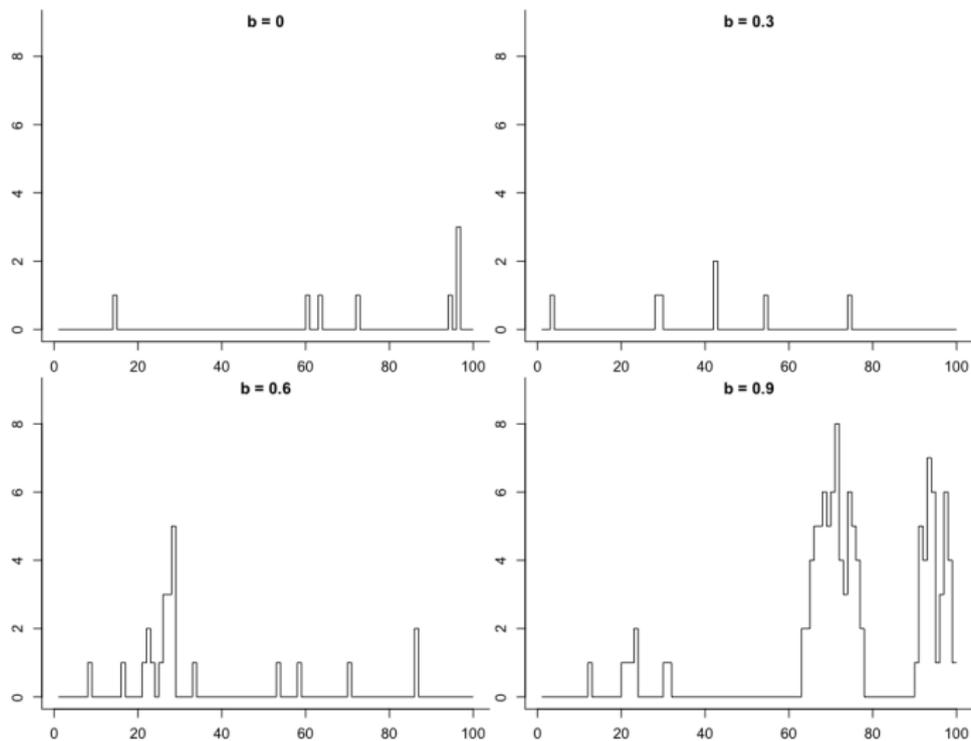
$$E[\theta_t | \alpha, \beta, c, y_{t-1}] = \alpha + \beta y_{t-1}$$

- ▶ Dynamic prior
- ▶ Note we condition on **observed**  $y_{t-1}$ . Alternative more standard model:

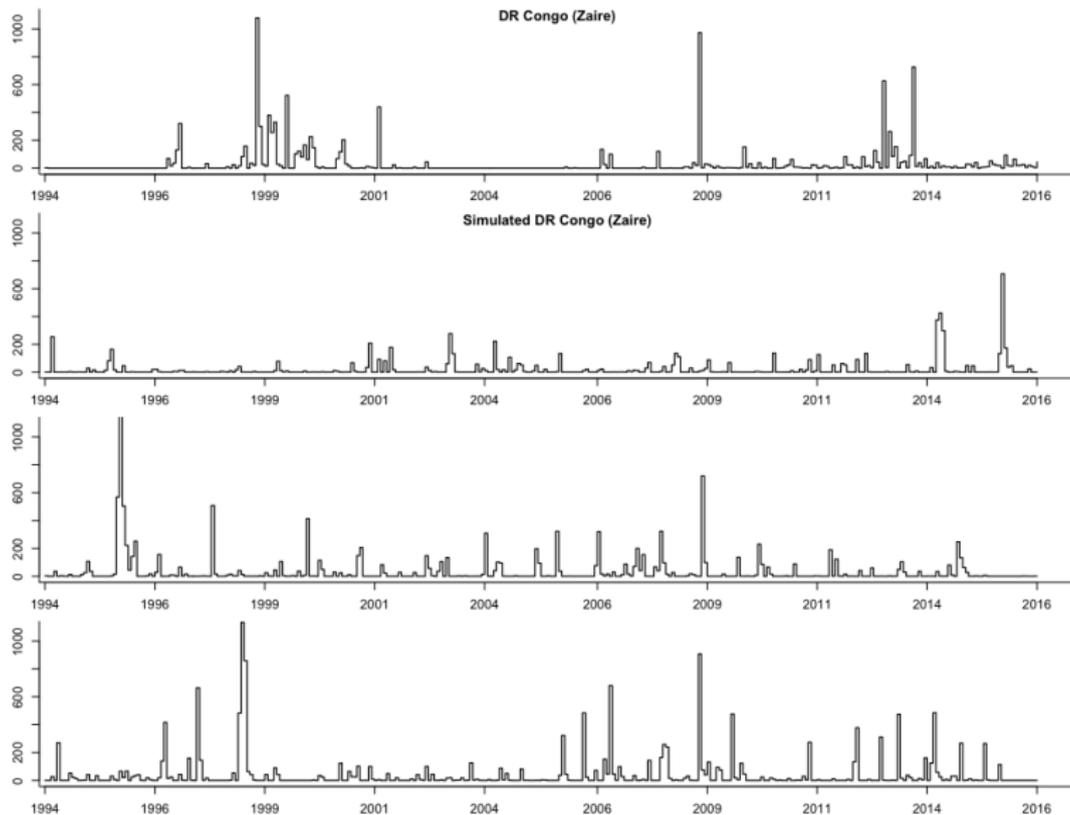
$$Y_t \sim \text{Poisson}(\theta_t)$$

$$\theta_t | \theta_{t-1} \sim \text{Gamma}(c \cdot (\alpha + \beta \theta_{t-1}), c)$$

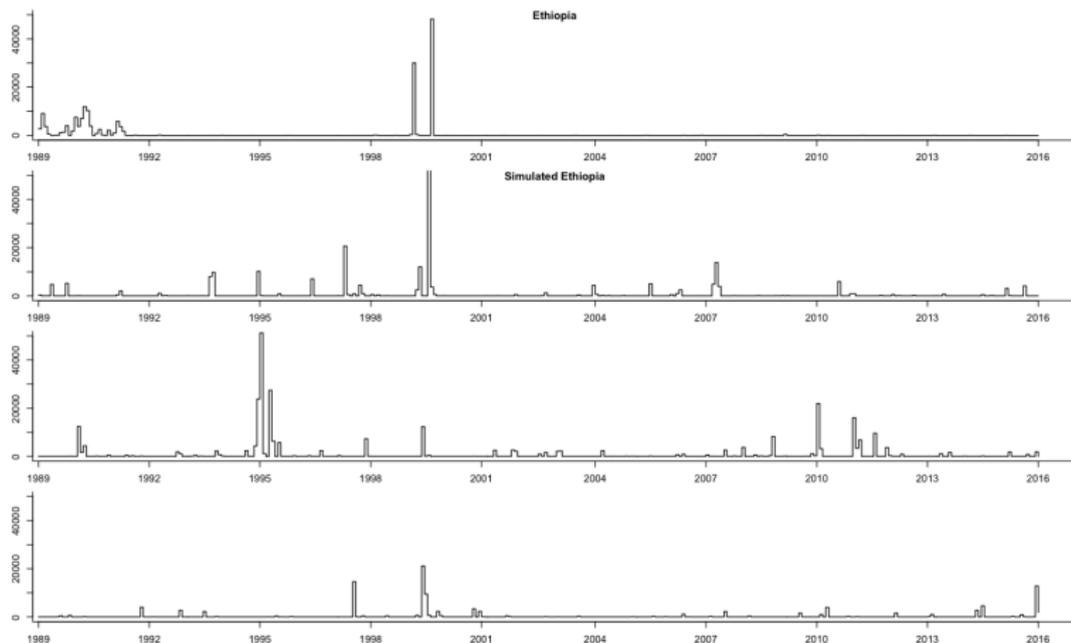
# Exploring model parameters, focus on $\beta$



# Modelling the data generating process



# Modelling the data generating process



$$Y_t \sim \text{Poisson}(\theta_t)$$

$$\theta_t | y_{t-1} \sim \text{Gamma}(c \cdot (a(x) + b(x)y_{t-1}), c)$$

$$E[\theta_t | \alpha, \beta, x, c, y_{t-1}] = a(x) + b(x)y_{t-1}$$

$$a(x) = e^{x_t^t \alpha}$$

$$b(x) = \frac{1}{(1 + e^{-x_t^t \beta})} \Rightarrow 0 < \beta(x) < 1$$

- ▶ PKOs can either directly influence the stochastic intensity, by having an effect on, or influence escalation by having an effect on

## Some very very preliminary findings

- ▶ We add a variable marking whether a PKO with a multidimensional or higher mandate was deployed to the country
- ▶ ML estimation, one country, Congo:
- ▶ Baseline intensity,  $a$ , 11 to 36
- ▶ Escalation,  $b$ , 0.42 to 0.19
- ▶ Parsimonious model for now, other covariates need to be considered
- ▶ Uncertainty
- ▶ Endogeneity

## Some very very preliminary findings

- ▶ ML estimation, Congo, Colombia, Mozambique, and Sudan.

- ▶ Intensity, a:

Congo	29.1	27.5
Colombia	92.9	87.7
Sudan	71.4	67.4
Mozambique	5.2	4.9

- ▶ Escalation, b:

Congo	.18	.31
Colombia	.32	.49
Sudan	.19	.33
Mozambique	.33	.50

## Conclusions and way forward

- ▶ Some preliminary evidence that UN PKOs have conflict reducing effects
- ▶ Unclear on whether they affect baseline intensity, or escalatory dynamics
- ▶ Need to consider alternative processes to the Gamma
- ▶ Additional covariates
- ▶ Modelling dependencies between conflicts and countries
- ▶ Are there absorbing states (Kant's ewigen fried)?
- ▶ and lots lots more...

Thanks!

Håvard Mokleiv Nygård  
havnyg@prio.org

