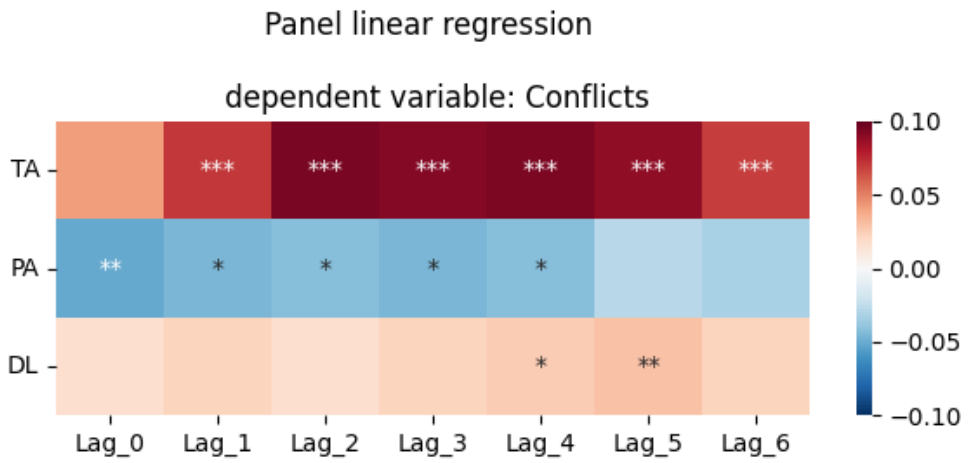
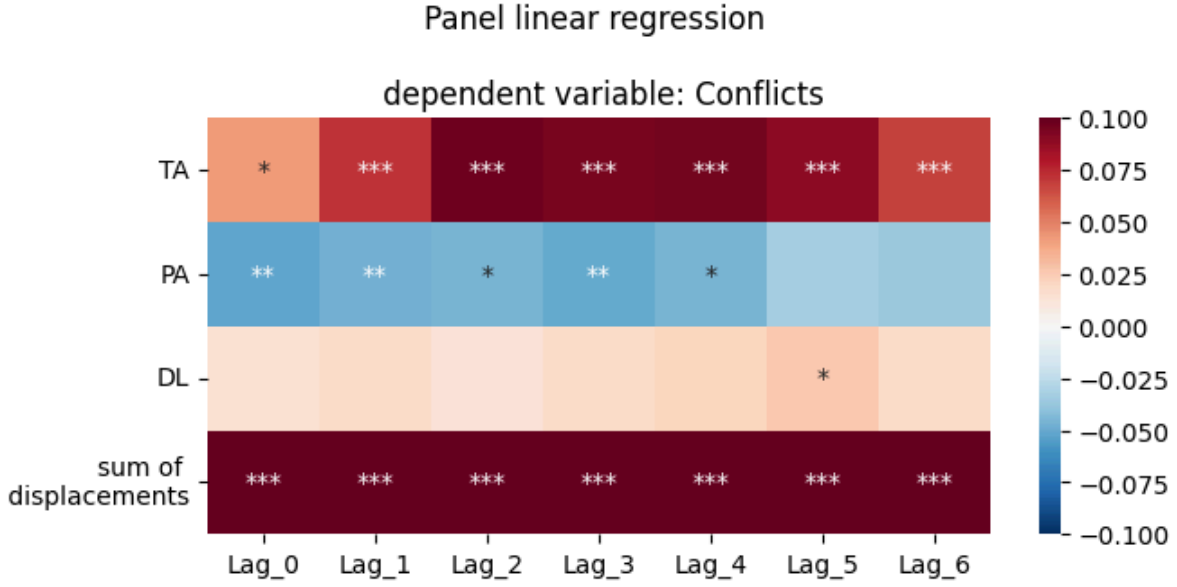
Panel linear regression with individual and time -fixed effects:

$$Conflicts_{i,m,y} = \alpha + \beta_1 TA_{i,m,y} + \beta_2 PA_{i,m,y} + \beta_3 DL^{TA}_{i,m,y} + \psi_i + \theta_{m,y} + \epsilon_{i,m,y}$$



$$Conflicts_{i,m,y} = \alpha + \beta_1 TA_{i,m,y} + \beta_2 PA_{i,m,y} + \beta_3 DL^{TA}_{i,m,y} + \\ + \beta_4 Sum\_displ_{i,m,y} + \psi_i + \theta_{m,y} + \epsilon_{i,m,y}$$



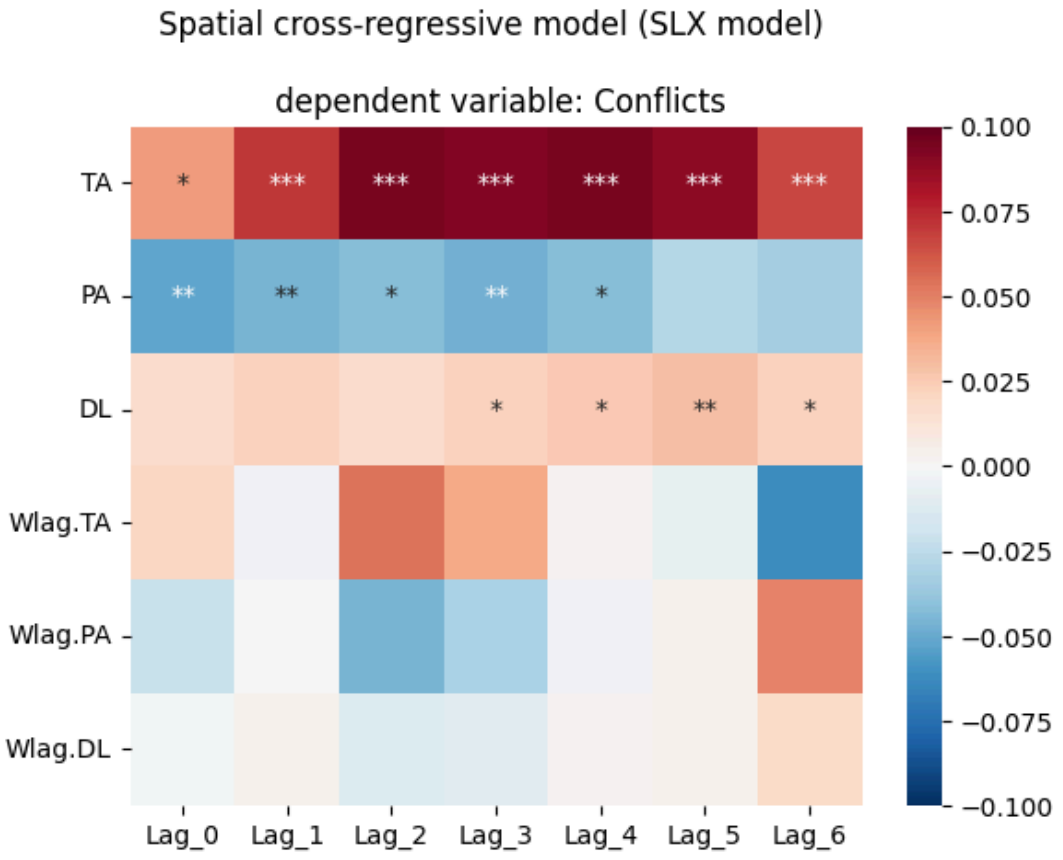
R-squared for these regressions is very low (~0.01) but comparable with similar model specifications in other works on similar topics

The **spatial cross-regressive model (SLX model)** presumes that the exploratory variables X_2, X_3, …, X_k as well as their spatial lags LX_2, …, LX_k influence a geo-referenced dependent variable Y. In this approach Y is not only affected by values the variables take in the same region but also they can take in neighbouring regions:

(5.1) $$\mathbf{y} = \beta_1 \mathbf{x}_1 + \beta_2 \mathbf{x}_2 + ... + \beta_k \mathbf{x}_k + \gamma_2 \mathbf{W}\mathbf{x}_2 + ... + \gamma_k \mathbf{W}\mathbf{x}_k + \boldsymbol{\varepsilon}$$

In our case, x_1, x_2, … are the climate variables TA, PA, DL. The spatial weight matrix W is a matrix containing the square of the inverse distance between regions.

In the heatmap below, Wlag.TA, Wlag.PA and Wlag.DL denote the spatial lags of the climate variables.

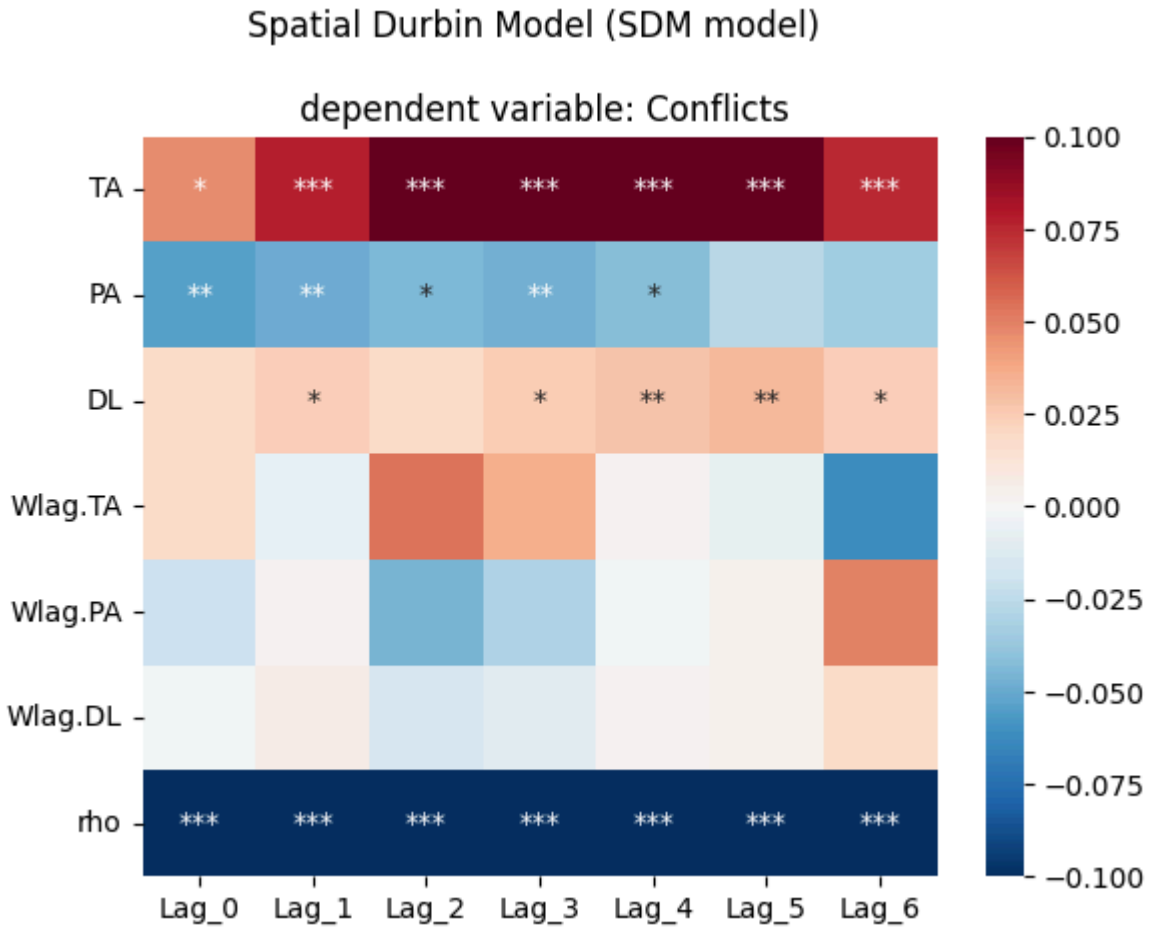


AIC	-6405.58	-6410.21	-6416.79	-6417.92	-6418.59	-6416.46	-6411.25

The **Spatial Durbin Model (SDM model)** is an extension of the Spatial Autoregressive (SAR) model because of the spatial interaction of the dependent variable and independent variables. SDM models, in general, can be written in the form of a matrix, like the following:

$$C_i = \alpha + \beta X_i + \gamma W X_j + \rho W C_j + \psi_i + \theta_t + \epsilon_{i,t}$$

In the heatmap below, Wlag.TA, Wlag.PA and Wlag.DL denote the spatial lags of the climate variables, and rho is the spatial lag of the dependent variable (i.e. conflicts).



AIC	-6414.50	-6419.96	-6427.71	-6428.52	-6429.92	-6427.96	-6421.39