# Unemployment and the rise of extremism in Slovakia

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## 1 Introduction

The function draws on a column published in Vox "a strong strong link between unemployment and voting for non-mainstream (especially populist) parties" (Algan Yann et al. 2017). Using Eurostat and regional election data from 2000 to 2017, the authors estimate an OLS model where a rise in unemployment has a significant effect on the support for extremist parties. The aim of this function is to develop a similar, albeit much more simplified model between unemployment and the support of populist or extremist parties and test it regionally within a country using Slovak national election data with results reported by the district from 2006 onwards. The case for choosing Slovakia is precisely because of great regional differences between districts as documented by the Household Finance and Consumption Survey (Messner & Zavadil 2014). The function first creates a general OLS regression model between the support of a chosen political party or grouping and unemployment in a given year. If it proves to be significant it tests whether the dependent variable is spatially clustered. On condition that it is, it moves on to run a geographically weighted regression model. Lastly, it compares the GWR model with alternative regression models accounting for spatial dependency between the data.

## 2 Inputs

The function operates with six specified parametres, four of them with a default value. The following table describes the inputs.

| Input Name | Input Description |
|---|---|
| inputParty | Political party abbreviation or grouping |
| inputYear | Election year and month |
| ncrit | Criterion for defining neighbours |
| queen | Specifies how contiguity is defined |
| style | Weighting style for the listw object |
| k | Specifies how many nearest points to choose |

Table 1: Argument descriptions

### inputParty

The **inputParty** argument takes the abbreviation of a political party which gained more than one percent in the national elections in a given year. A list of all parties with years in which they achieved more than 1 percent can be seen in table 1.

| | inputParty | inputYear |
|---|---|---|
| 1 | ANO | 200606, 201203 |
| 2 | KDH | 200606, 201006, 201203, 201603 |
| 3 | KSS | 200606, 201006 |
| 4 | LS.HZDS | 200606, 201006 |
| 5 | LSNS | 201006, 201203, 201603 |
| 6 | Most | 201006, 201203, 201603 |
| 7 | OLaNO | 201203, 201603 |
| 8 | Rodina | 201603 |
| 9 | SaS | 201006, 201203, 201603 |
| 10 | SDKU.DS | 200606, 201006, 201203 |
| 11 | SDL | 201006 |
| 12 | SF | 200606 |
| 13 | Siet | 201603 |
| 14 | Smer | 200606, 201006, 201203, 201603 |
| 15 | SMK.MKP | 200606, 201006, 201203, 201206 |
| 16 | SNS | 200606, 201006, 201203, 201206 |
| 17 | X99. | 201203 |
| 18 | ZZ | 201203 |

Table 2: List of all parties which can be taken as input

Alternatively, the argument can take one of the predefined categories in which political parties are grouped. As an example, the category *right* can be chosen. The predefined categories were custom coded and are displayed below.

| | inputParty | explanation |
|---|---|---|
| 1 | central | grouping of centric parties |
| 2 | right_reg | regular right-wing parties |
| 3 | right_ex | extremist or populist right-wing parties |
| 4 | right | all right-wing parties |
| 5 | left_reg | regular left-wing parties |
| 6 | left_ex | extremist or populist left-wing parties |
| 7 | left | all left-wing parties |
| 8 | reg | all regular parties |
| 9 | ex | all extremist parties |
| 10 | parochial | all parochial parties |
| 11 | cosmopolitan | all cosmopolitan parties |

Table 3: List of all possible categories

### inputYear

The **inputYear** argument takes the year and the month of national elections in Slovakia from June 2006 onwards. It must be specified in the YYYYMM format. Four possible inputs shown in table 4 are possible.

| | Date of election | inputYear |
|---|---|---|
| 1 | June 2006 | 200606 |
| 2 | June 2010 | 201006 |
| 3 | March 2012 | 201203 |
| 4 | March 2016 | 201603 |

Table 4: Valid inputs for the inputYear argument

**ncrit**

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The **ncrit** argument takes a criterion for defining the neighbours object. Either *contiguity* (default value) can be used in which case the neighbours are defined based on sharing common boundaries or *distance* can be used where k nearest points are chosen as neighbours.

**queen**

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The **queen** argument only works when the defining criterion for neighbours is contiguity. If **queen** is *TRUE* (default value) areas sharing any boundary point are taken as neighbours. If **queen** is *FALSE* areas sharing more than one boundary point are taken as neighbours.

**k**

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The **k** argument only works when the defining criterion for neighbours is distance. **k** accepts numeric inputs and specifies the number of nearest points which should be chosen as neighbours.

**style**

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The **style** argument specifies the weighting style of the neighbours. Either $W$ or $B$ can be supplied into the argument. If $W$ is provided proportional weights are going to be assigned. Conversely, if $B$ is chosen binary weights are going to be assigned and districts with many neighbours are going to be up-weighted.

# 3 Party categorisation coding

As already shown above, the **inputParty** argument also takes customly coded categories as inputs. This section will explain the rationale behind choosing the categories in the first place and will then try to justify the method used for coding.

The argument by Algan Yann et al. (2017) is that there is a strong link between unemployment and voting for non-mainstream parties. With literature (De Vries 2017) suggesting that the left-right divide has been increasingly

replaced by cosmopolitan-parochial divide, we might expect the relationship between unemployment and voting for parochial parties to become stronger than the relationship between unemployment and voting for more right-wing/left-wing parties. By including both the classical left-right and the cosmopolitan-parochial divide as categories, the model can be tested for various relationships.

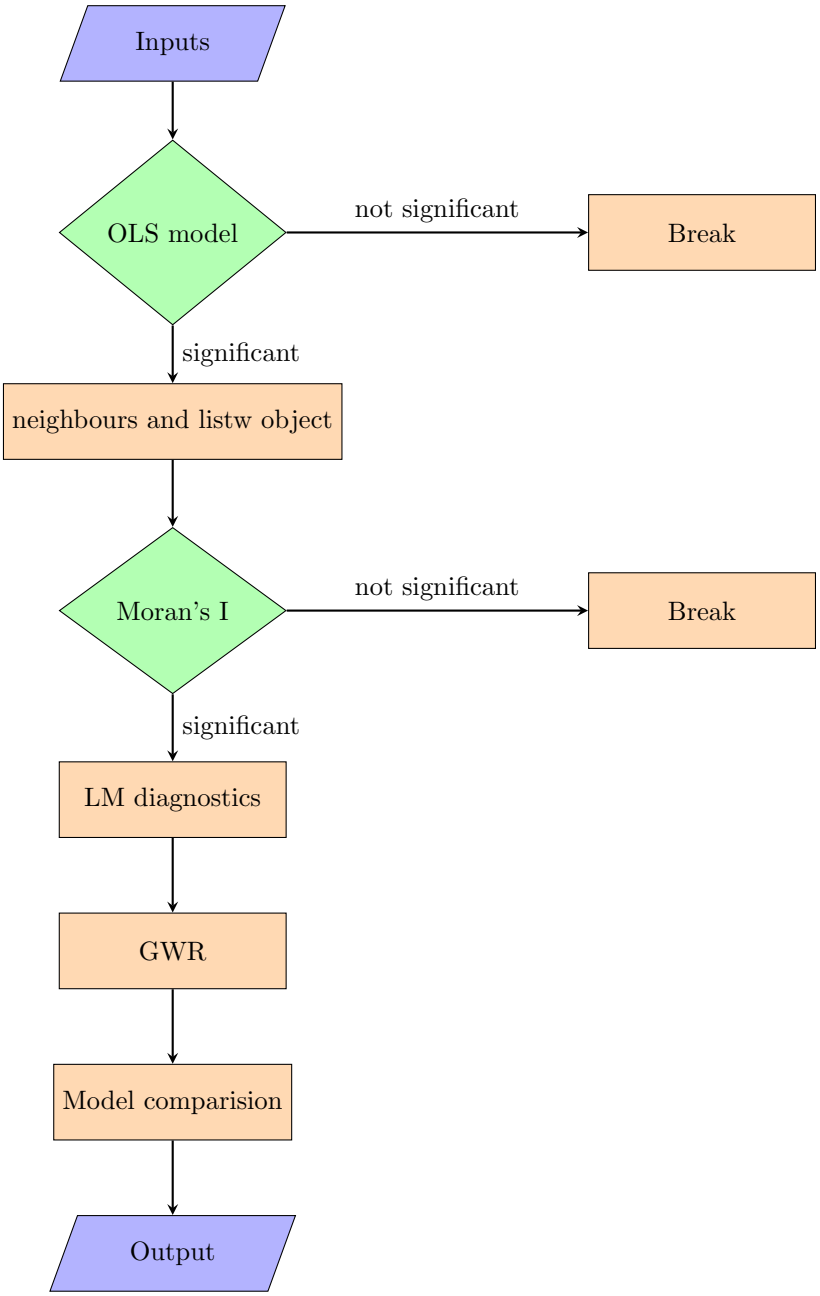
The cosmopolitan-parochial divide is coded using the Chapell Hill Expert Survey trend's file position variable (Polk et al. 2017, Huber & Shipan 2002). The variable assigns a unique score from 0 to 7 to every major political party in a given year based on their stance to European integration. A more positive stance means a higher score. For the purposes of my function, a score equal or higher than five signifies a party which is cosmopolitan.

The left-right divide is coded with the help of the Manifesto project dataset (Volkens et al. 2017). The project coded every political party up until the year 2012 with regard to their left-right standing with negative values signalising a relative left-leaning and positive values signalising a relative right-leaning. I took these values as a basis but used a simplified coding method with having some values missing for the last elections imputed by myself. -2 value labels extremist/populist right parties, -1 standard right parties, 0 centrist parties, 1 standard leftist parties, 2 extremist/populist leftist parties.

# 4 Data manipulation

The aim of this section is to show how the dataset the function works with was put together. It is important to note that the data used in the function is not provided in this form and needed to be manipulated at first. The election results by district obtained from the Statistical Office of the Slovak republic (Statisticky urad Slovenskej republiky n.d.) were first merged into one file with column names renamed into a suitable form. This file was then merged with the unemployment figures for each district obtained from the Central Office of Labour, Social Affairs and Family (prace socialnych veci a rodiny n.d.). In the next step the votes for different parties were aggregated by the specified coding categories and then transformed into percentage measure.

# 5 Flowchart




# 6 Explaining the function

The function first takes the six inputs as arguments and creates a simple OLS model using the election results of the **inputParty** in the **inputYear** as the dependent variable and the unemployment level in the **inputYear** as the independent variable. If the p-value of the model and of the coefficients is below

0.05, it then proceeds to create the neighbour and listw objects with specific parametres using the **ncrit**, **k**, **queen** and **style** arguments. Subsequently, the Moran's test for autocorrelation is run on the dependent variable and on the linear regression model residuals to test whether there is spatial clustering. If the tests prove to be significant, the type of spatial dependence is found using LM diagnostics for spatial dependence (Anselin 1988). If the LM tests prove to be significant, the robust tests can be run to determine which type of spatial dependence may be at work and which model to choose comparing the AIC score (Anselin n.d.). Then the geographically weighted regression which we are interested in as we want to explore nonstationarity between districts is plotted.

# 7 Testing the hypothesis

In this section, I will test the hypothesis outlined in the introduction whether higher unemployment correlates with a stronger support for populist or extremist parties.

I will start by running the function for the 2006 data where there is no significant relationship (table 5).

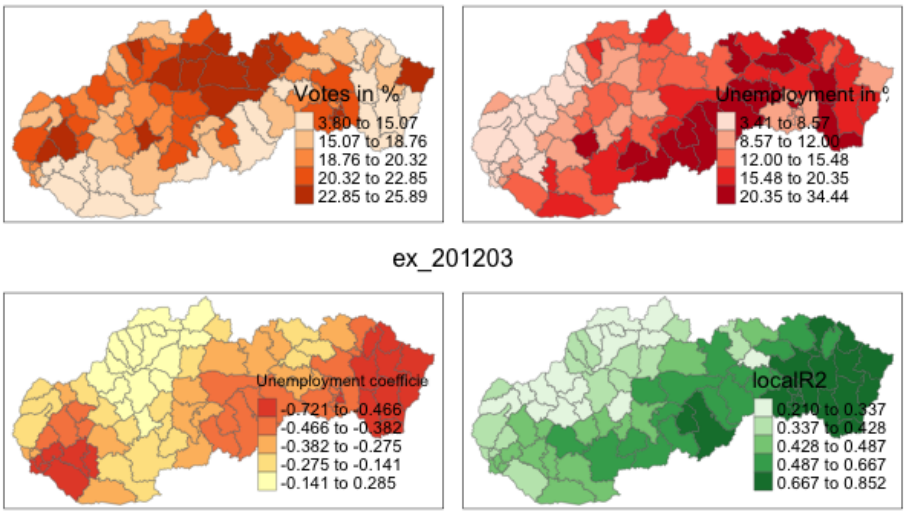
| | Model 1 |
|---|---|
| (Intercept) | 28.29*** |
| | (1.95) |
| Unemployment 2006 | −0.08 |
| | (0.15) |
| $R^2$ | 0.00 |
| Adj. $R^2$ | -0.01 |
| Num. obs. | 79 |
| RMSE | 8.43 |

$^{***}p < 0.001$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 5: OLS regression table

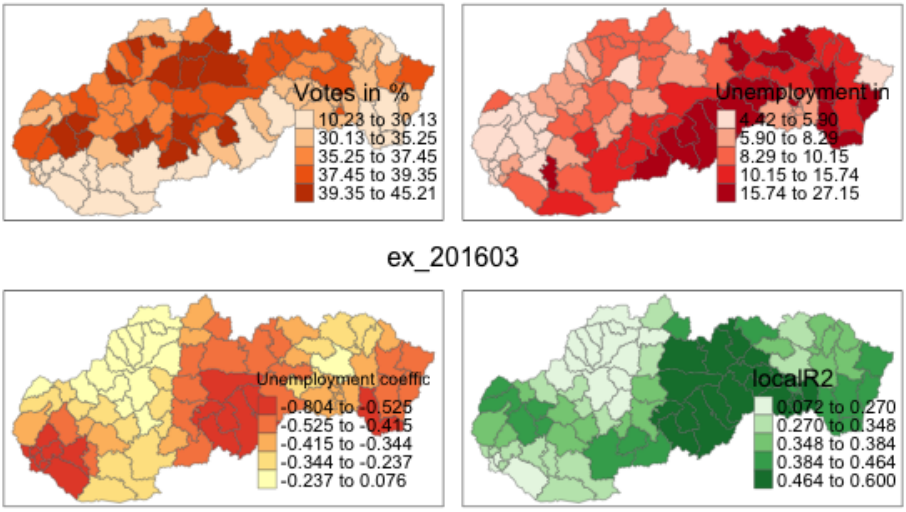
The function returns similar outputs for the 2010 election data. However, the situation changes with the year 2012 where the relationship between unemployment and support for extremist/populist parties becomes significant and negative with adjusted r-squared of 0.10. The dependent variable is also spatially clustered. The output of the geographically weighted regression, which attained the lowest AIC, can be seen in figure 1.

Figure 1: GWR for extremist parties in 2012




The OLS continues to be significant in 2016 with a lower adjusted r-squared value of only 0.04.

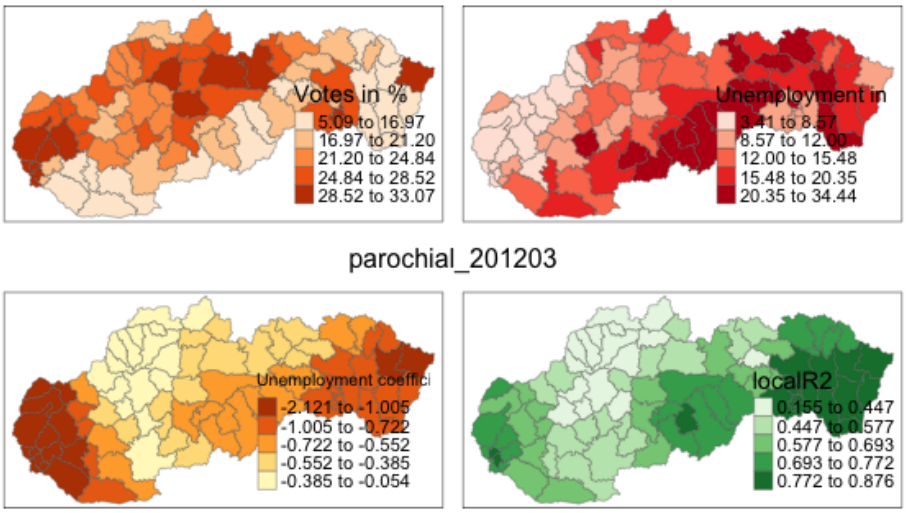
Figure 2: GWR for extremist parties in 2016




The function ergo suggests that the post-crisis relationship between unemployment and support for extremist/populist parties has become significant, however not in line with columns argument suggesting a positive relationship. The opposite direction of the relationship seems rather odd. An increase of unemployment translates to less support of extremist parties.

Now, I will proceed to test the effect of unemployment on the support of parochial parties. The relationship was insignificant with negative r-squared in 2006. The model became significant in all subsequent elections showing a negative relationship. The figure below plots the gwr model for the year 2012.

Figure 3: GWR for parochial parties in 2012




This example has not provided support for the testing hypothesis. The idea that higher unemployment correlates with lower support of parochial parties or extremist seems counter-intuitive at best. The explanation for this anomaly may indicate that voting behaviour in Slovakia does neither follow the cosmopolitan-parochial divide nor the typical left-right divide.

# 8 Limitations

One of the severe limitations of the model lies in the coding mechanisms of the categories. These were custom-coded and better methodology is needed to capture the real divides. Another limitation of the model is its simplistic form in comparison with the one presented by Algan Yann et al. (2017). Even though in its current form the function bears limited inferential power and more work on its design needs to be done, it points at the usefulness of using geospatial data in analysing local voting patterns.

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