Creating smoothed maps with the help of the command `spmap`
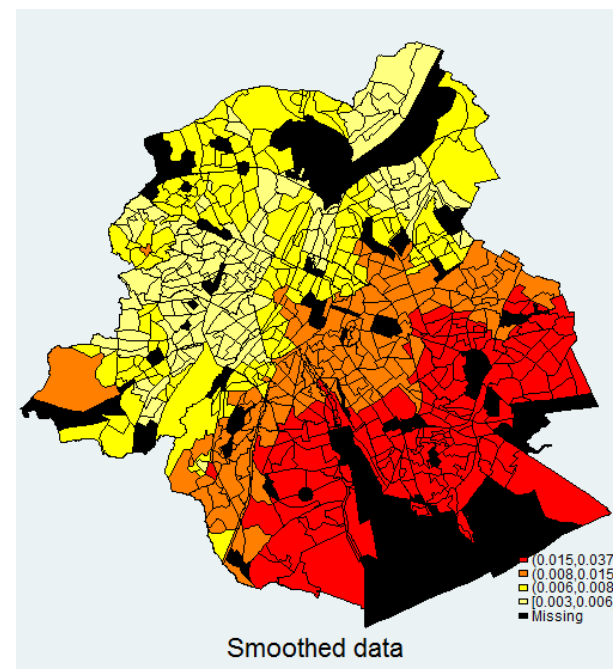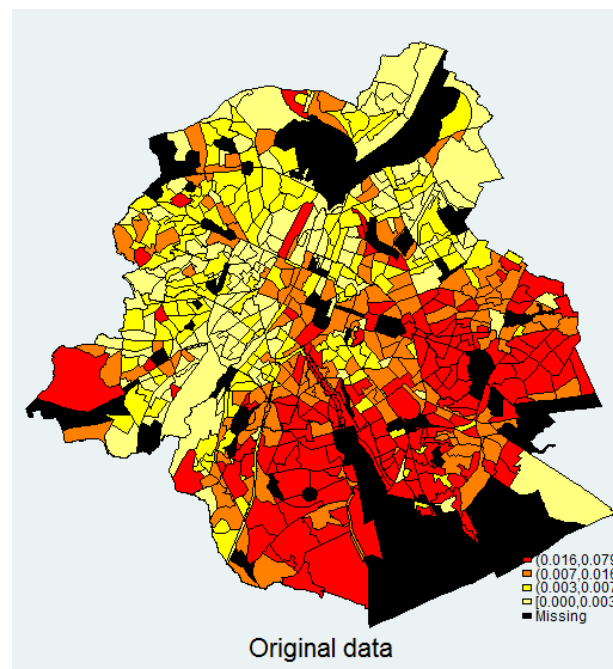
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PhD holders as a percent of the population in the Brussel Region

Original data

Smoothed data

2. MAP DRAWING USING `spmap`

Great tool for creating maps in exploratory analyses from do files.

3 steps involving user commands available at the SSC Archive:

1. Convert shapefile into Stata datafiles.

    `shp2dta` (Kevin Crow, Statacorp) creates two .dta files with attribute data and coordinate data.
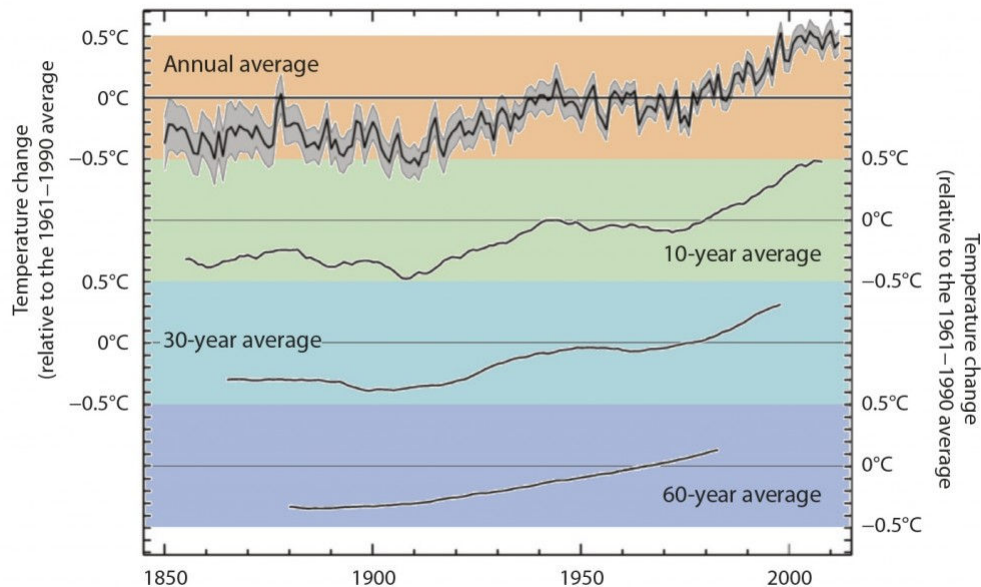
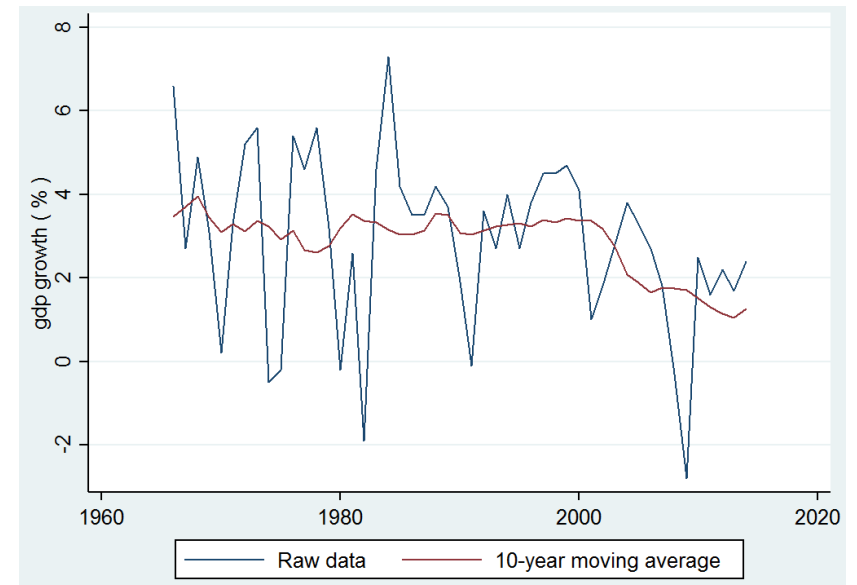2. Merge the data that you want to visualize with the attribute file.

3. Draw maps.

    `spmap` (Maurizo Pisati, University of Milano-Bicocca) draws maps using the attribute and coordinate datafiles.

3. SMOOTHING: OPPORTUNITIES AND RISKS

Evolution of temperature, 1850-2010

Evolution of GDP growth, 1966-2016

Smoothing is great to bring out the overall pattern,
but it masks deviations to this pattern.

This applies to times series as well as spatial data.

4. SMOOTHED MAPS

The command `spatialaverage` creates a new variable in which the value of each geographical unit is replaced by its spatial average.

```
spatialaverage varname [, options]
```

Options

`localweight(real)`	weight of the current observation in the average
`smoothing(#)`	parameter specifying the distance function
`generate(newvarname)`	new variable containing spatial averages
`id(string)`	the variable identifying the geographical units
`x_center(varname)`	specifies x-coordinate of the centroids
`y_center(varname)`	specifies y-coordinate of the centroids

5. PROCEDURE

Spatialaverage = weighted average of local value and neighbourhood value

weight = set by user option `localweight` (default is 0.1)

`Localweight=1` replicates the original variable (no smoothing).
`Localweight=0` creates a spatially lagged variable (as in Moran's I).

Neighbourhood value = weighted average of the surrounding localities with

$$\text{weight} = \frac{1}{distance^{1/s}}$$

- $s > 0$ determines the level of smoothing (default is 0.5)

  The larger s, the more smoothing and the smaller the standard deviation of the new smoothed var iable. The standard deviation is zero as s approaches infinity (with localweight = 1/n).
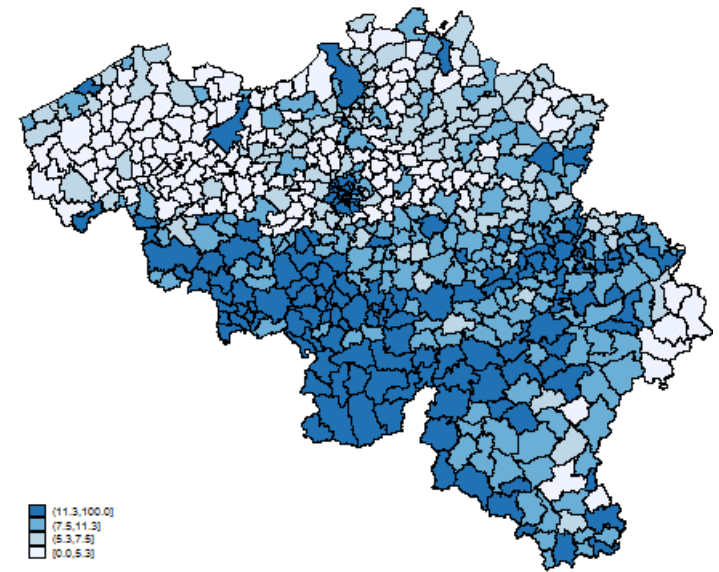
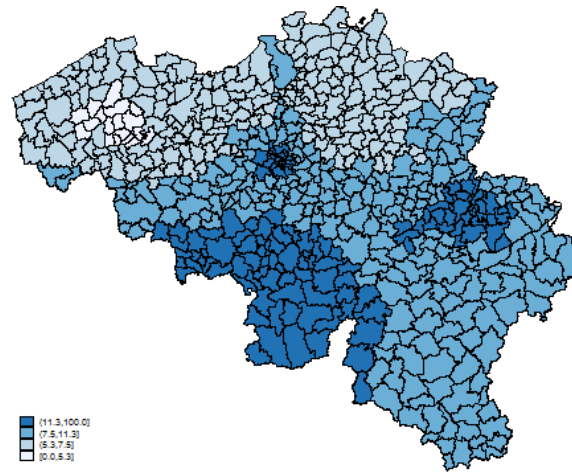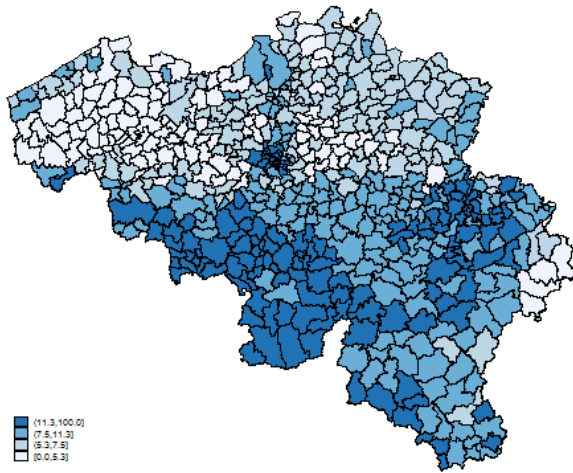- Resulting distance matrix has zero diagonal and is row standardized.
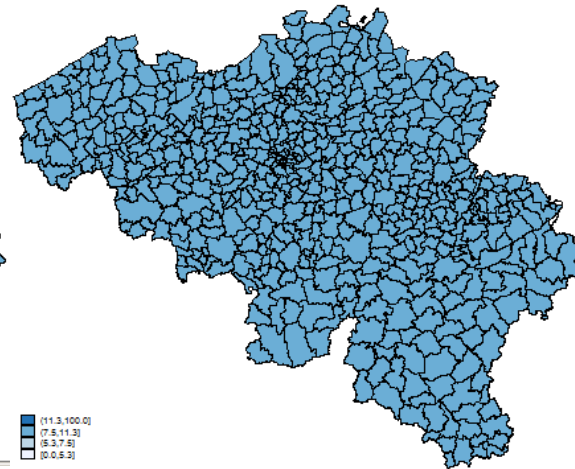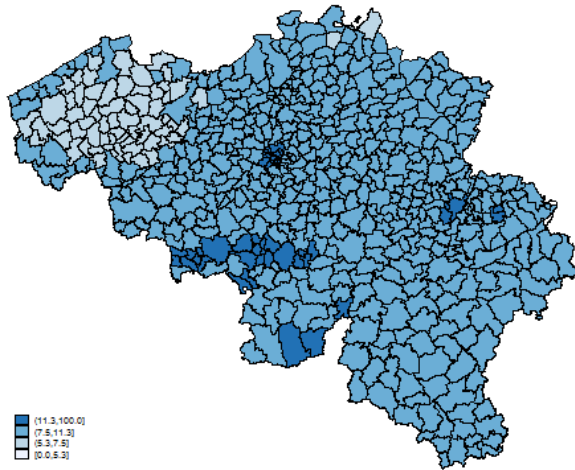
6. THE SMOOTHING PARAMETER

s=0.1

s=0.5

(All maps have the same classes)

Original

s=1

s=10

Thank you!