Spatial Economics – Assignment 3

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The code that was used in compiling the assignment is available on GitHub at https://github.com/gustavpirich/spatial_econ/blob/main/03_assignment/03_assignmnet.Rmd.

Exercise B

Unit of Observation

```
## Simple feature collection with 2757 features and 4 fields
## Geometry type: POLYGON
## Dimension:     XY
## Bounding box:  xmin: -17.96222 ymin: -34.822 xmax: 52.03778 ymax: 38.178
## Geodetic CRS:  WGS 84
## # A tibble: 2,757 x 5
##    CELLID latitude_m longitude_                                geometry    area
##  *  <int>      <dbl>      <dbl>                            <POLYGON [°]>   [m^2]
##  1     42      -34.5       18.5 ((19.03778 -33.822, 19.03778 -34.822, 1~ 1.02e10
##  2     43      -34.5       19.5 ((20.03778 -33.822, 20.03778 -34.822, 1~ 1.02e10
##  3     44      -34.5       20.5 ((21.03778 -33.822, 21.03778 -34.822, 2~ 1.02e10
##  4     45      -34.5       21.5 ((22.03778 -33.822, 22.03778 -34.822, 2~ 1.02e10
##  5     46      -34.5       22.5 ((23.03778 -33.822, 23.03778 -34.822, 2~ 1.02e10
##  6     47      -34.5       23.5 ((24.03778 -33.822, 24.03778 -34.822, 2~ 1.02e10
##  7     48      -34.5       24.5 ((25.03778 -33.822, 25.03778 -34.822, 2~ 1.02e10
##  8     49      -34.5       25.5 ((26.03778 -33.822, 26.03778 -34.822, 2~ 1.02e10
##  9    131      -33.5       17.5 ((18.03778 -32.822, 18.03778 -33.822, 1~ 1.03e10
## 10    132      -33.5       18.5 ((19.03778 -32.822, 19.03778 -33.822, 1~ 1.03e10
## # i 2,747 more rows
```

Cells	Stats
Min	9785713765 [m^2]
Mean	11698674731 [m^2]
Median	11904427037 [m^2]
Max	12364312149 [m^2]

The unit of observation are 'subnational' cells in a raster grid of 1 degree of latitude × 1 degree longitude. At the equator this corresponds to a side length of 110 km. The areal extension of the cells varies with the latitude. If you go forther away from the equator, the area of a cell decreases. The table shows the area of the cells. The smallest cell has an area of about 97 857 km^2, the largest 12 364 km^2. On average the size of the cells is 11 900 km^2. Thus the smalles cell is about 20 percent smaller than the largest cell. They differ because of the distortions induced by the projection of the surface of the earth, onto a 2 dimensional raster grid.

Interpretation of Coefficients