

Package ‘strm’

November 2, 2020

Title Spatio-Temporal Regression Modeling

Version 0.1.1

Description Implements a spatio-temporal regression model based on Chi, G. and Zhu, J. (2019) Spatial Regression Models for the Social Sciences <isbn:9781544302072>. The approach here fits a spatial error model while incorporating a temporally lagged response variable and temporally lagged explanatory variables. This package builds on the errorsarm() function from the spatialreg package.

Depends R (>= 3.5), spatialreg (>= 1.1-5)

Imports rlang (>= 0.4.6), dplyr (>= 1.0.0), tidyr (>= 1.0.0), purrr (>= 0.3.4), magrittr (>= 1.5), rgdal (>= 1.5.10), testthat (>= 2.3.2), rmarkdown (>= 2.3), stats, grDevices, methods, graphics, utils, knitr

Suggests splm (>= 1.4.11), spdep (>= 1.1-3), rgeos (>= 0.5-3), sf (>= 0.9-4), Ecdat (>= 0.3-7), tidycensus (>= 0.9.9), ggplot2 (>= 3.3.2), patchwork (>= 1.0.1), broom (>= 0.7.0)

VignetteBuilder knitr

Encoding UTF-8

License GPL (>= 2)

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BugReports <https://github.com/mkamenet3/strm/issues>

LazyData true

RoxygenNote 7.1.0

SystemRequirements C++11, GDAL (>= 1.11.4), GEOS (>= 3.4.0), PROJ (>= 6.3.1)

NeedsCompilation yes

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Repository CRAN

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createlagvars	<i>createlagvars</i>
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Description

Creates lagged explanatory and response variables for data in long format.

Usage

```
createlagvars(data, vars, id, time = time, wide, filter_options)
```

Arguments

<code>data</code>	Name of dataframe that has been transformed in strm (object <code>modframe0</code>).
<code>vars</code>	Response and explanatory variables to be lagged.
<code>id</code>	Group identifier (example: state).
<code>time</code>	Number of time periods in the dataset. Lags will be taken for each time period. Default is 2 time periods. For a spatial-only regression model, set <code>time=1</code> .
<code>wide</code>	Boolean indicator. Takes TRUE if data is in wide format and FALSE if data is in long format. Default is FALSE.
<code>filter_options</code>	Additional arguments to be passed to <code>dplyr::filter()</code> .

Details

Create lagged and transformed variables

sptdmg3	<i>sptdmg3 SpatialPolygonsDataFrame: Wisconsin Minor Civil Divisions</i>
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Description

We use the example from Chi, G. and Zhu, J. (2019) *Spatial Regression Models for the Social Sciences*. The example uses population growth data from 2000 to 2010. Data are at the minor civil division (MCD) level in Wisconsin. There are two years of data: 2000 and 2010. The subset of variables we use are:

- LNP1000: population growth from 2000 to 2010.
- LNP0090: population growth from 1990 to 2000.
- POLD00: percentage of the old population (age sixty-five and older) in 2000.
- POLD90: percentage of the old population (age sixty-five and older) in 1990.

Usage

```
data(sptdmg3)
```

Format

An object of class `SpatialPolygonsDataFrame` with 1837 rows and 7 columns.

References

Chi, Guangqing, and Jun Zhu (2019). *Spatial Regression Models for the Social Sciences*. SAGE.

Examples

```
data(sptdmg3)
class(sptdmg3)
names(sptdmg3)
```

wi_raw	<i>wi_raw sf dataframe: Wisconsin 5-Year County-Level Raw ACS Data</i>
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Description

We use two 5-year ACS county level data in Wisconsin downloaded using the `tidycensus` R package. The example uses raw 5-year estimates from 2013-2017 and 2014-2018 ACS data at the county-level in Wisconsin. The variables downloaded are:

- B17020_002 - Estimate: Total - Income in the past 12 months below poverty level
- B17020_001 - Estimate: Total - Poverty Status in the past 12 months.

- B23022_026 - Estimate: Total Female by Work Status by weeks worked in the past 12 months for the population 16-64 years old.
- B23022_001 - Estimate: Total: status in the past 12 months by usual hours worked per week in the past 12 months by weeks worked in the past 12 months for the population 16-64 years old (Male and Female)

Usage

```
data(wi_raw)
```

Format

An object of class `sf` (inherits from `data.frame`) with 576 rows and 7 columns.

References

Kyle Walker (2020). `tidycensus`: Load US Census Boundary and Attribute Data as 'tidyverse' and 'sf'-Ready Data Frames. R package version 0.9.9.5. <https://CRAN.R-project.org/package=tidycensus>

Examples

```
data(wi_raw)
class(wi_raw)
names(wi_raw)
```

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