

Package ‘SynthCast’

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Type Package

Title Synthetic Control Method to Forecast Series

Version 0.2.1

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Description Not a new method implementation.

Usage of the Synthetic Control Method, see Abadie et al. (2011) <[doi:10.18637/jss.v042.i13](https://doi.org/10.18637/jss.v042.i13)>, as an ad-hoc approach to forecast series with panel in a specific context. The context being: There are units in different stages of a certain journey, there the assumption that the units’ behavior throw out the journey are similar is valid and there are not enough data to use traditional forecasting methods. For a usage example see the package home page documentation.

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URL <https://viniciusmsousa.github.io/SynthCast/>

Encoding UTF-8

LazyData true

Imports dplyr, tidyr, Synth, utils, forcats

RoxygenNote 7.1.1

Depends R (>= 2.10)

Suggests knitr, covr, testthat (>= 3.0.0), rmarkdown, badger

Config/testthat/edition 3

VignetteBuilder knitr

NeedsCompilation no

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compute_result_tables *compute_result_tables*

Description

Internal function. Please refer to run_synthetic_forecast documentation.

Usage

```
compute_result_tables(
  df,
  synthetic_control_output,
  col_unit_name,
  unit_of_interest,
  serie_of_interest,
  max_time_unit_of_interest,
  periods_to_forecast,
  col_time
)
```

Arguments

`df` Main DataFrame.

`synthetic_control_output` Output from compute_synthetic_control().

`col_unit_name` String with column name of the column with the units names.

`unit_of_interest` Value of the col_unit_name that is of interest.

`serie_of_interest` Column name os the serie to be projected.

`max_time_unit_of_interest` Outout from intern_get_max_time_unit_of_interest().

`periods_to_forecast` (Integer) Number of periods to forecast.

`col_time` String with the column name of the time column.

Value

List with result tables.

`compute_synthetic_control`
compute_synthetic_control

Description

Internal function. Please refer to `run_synthetic_forecast` documentation.

Usage

```
compute_synthetic_control(  
  prepared_dataset,  
  unit_of_interest,  
  serie_of_interest,  
  col_time,  
  max_time_unit_of_interest  
)
```

Arguments

`prepared_dataset` Output from `prepare_dataset()`.
`unit_of_interest` Value of the `col_unit_name` that is of interest.
`serie_of_interest` Column name os the serie to be projected.
`col_time` String with the column name of the time column.
`max_time_unit_of_interest` Outout from `intern_get_max_time_unit_of_interest()`.

Details

Compute the synthetic control (wraps Synth package).

Value

List with (i) `Synth::dataprep()` output and (ii) `Synth::Synth()` output.

df_example	<i>Dataset with a y series to be forecasted, and its cumulated value.</i>
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Description

A generic dataset with a Y value and X predictors.

Usage

```
df_example
```

Format

A dataframe with 1275 rows e 32 variaveis:

unit Unit identification

time_period Time period, ascending integers.

x1-x28 Variables.

intern_elegile_units	<i>intern_elegile_units</i>
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Description

Internal function. Please refer to run_synthetic_forecast documentation.

Usage

```
intern_elegile_units(  
  df,  
  col_unit_name,  
  col_time,  
  max_time_unit_of_interest,  
  periods_to_forecast  
)
```

Arguments

df	Main DataFrame.
col_unit_name	String with column name of the column with the units names.
col_time	String with the column name of the time column.
max_time_unit_of_interest	Outout from intern_get_max_time_unit_of_interest().
periods_to_forecast	(Integer) Number of periods to forecast.

Details

Selects the eligible units to build the synthetic control: Rule the eligible units are the units that have at least `max_time_unit_of_interest + periods_to_forecast` time periods.

Value

DataFrame with the columns: (i) `col_unit_name` and (ii) `manter` (bool)

```
intern_get_max_time_unit_of_interest
      intern_get_max_time_unit_of_interest
```

Description

Internal function. Please refer to `run_synthetic_forecast` documentation.

Usage

```
intern_get_max_time_unit_of_interest(  
  df,  
  col_unit_name,  
  unit_of_interest,  
  col_time  
)
```

Arguments

<code>df</code>	Main DataFrame.
<code>col_unit_name</code>	String with column name of the column with the units names.
<code>unit_of_interest</code>	Value of the <code>col_unit_name</code> that is of interest.
<code>col_time</code>	String with the column name of the time column.

Details

Intern function to compute the max time period of the unit of interest.

Value

Same type as `col_time`, max value.

```
prepare_dataset      prepare_dataset
```

Description

Internal function. Please refer to run_synthetic_forecast documentation.

Usage

```
prepare_dataset(  
  df,  
  df_elegible_units,  
  col_unit_name,  
  col_time,  
  unit_of_interest,  
  max_time_unit_of_interest  
)
```

Arguments

```
df          Main DataFrame.  
df_elegible_units  
            output from intern_elegible_units().  
col_unit_name  String with column name of the column with the units names.  
col_time      String with the column name of the time column.  
unit_of_interest  
            Value of the col_unit_name that is of interest.  
max_time_unit_of_interest  
            Outout from intern_get_max_time_unit_of_interest().
```

Value

A dataset to be inputed in the compute_synthetic_control().

```
run_synthetic_forecast  
      run_synthetic_forecast
```

Description

Executes all the other package functions in order to have a list with the results table.

Usage

```
run_synthetic_forecast(  
  df,  
  col_unit_name,  
  unit_of_interest,  
  col_time,  
  periods_to_forecast,  
  serie_of_interest  
)
```

Arguments

`df` Main DataFrame.

`col_unit_name` String with column name of the column with the units names.

`unit_of_interest` Value of the `col_unit_name` that is of interest.

`col_time` String with the column name of the time column.

`periods_to_forecast` (Integer) Number of periods to forecast.

`serie_of_interest` Column name os the serie to be projected.

Value

List with results table.

Examples

```
synthetic_forecast <- run_synthetic_forecast(  
  df = df_example,  
  col_unit_name = 'unit',  
  col_time='time_period',  
  periods_to_forecast=12,  
  unit_of_interest = '30',  
  serie_of_interest = 'x1'  
)
```

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