STaTa
Statistics/Data analysis

Title

> **scplotmulti** —— Synthetic Control Methods with Multiple Treated Units Plots.

Syntax

> **scplot** , [**scest uncertainty(***string***) uncertainty(***string***) joint yscalefree**
> **xscalefree dots_tr_col(***colorstyle***) dots_tr_symb(***symbolstyle***)**
> **dots_tr_size(***markersizestyle***) dots_sc_col(***colorstyle***) dots_sc_symb(**
> ***symbolstyle***) dots_sc_size(***markersizestyle***) line_tr_col(***colorstyle***)**
> **line_tr_patt(***linepatternstyle***) line_tr_width(***linewidthstyle***)**
> **line_sc_col(***colorstyle***) line_sc_patt(***linepatternstyle***)**
> **line_sc_width(***linewidthstyle***) spike_sc_col(***colorstyle***)**
> **spike_sc_patt(***linepatternstyle***) spike_sc_width(***linewidthstyle***)**
> **gphoptions(***string***) gphcombineoptions(***graph combine***) gphsave(***string***)**
> **savedata(***dta_name***) keepsingleplots pypinocheck**]

Description

> **scplot** implements several Synthetic Control (SC) plots even in the presence of
> multiple treated units and staggered adoption. The command is designed te be
> called after scest or scpi which implement estimation and inference procedures
> for SC methods using least squares, lasso, ridge, or simplex-type constraints
> according to Cattaneo, Feng, and Titiunik (2021). The command is a wrapper of
> the companion Python package. As such, the user needs to have a running
> version of Python with the package installed. A tutorial on how to install
> Python and link it to Stata can be found here.
>
> Companion R and Python packages are described in Cattaneo, Feng, Palomba and
> Titiunik (2022).
>
> Companion commands are: scdata for data preparation, scest for estimation
> procedures, and scpi for inference procedures.

> Related Stata, R, and Python packages useful for inference in SC designs are
> described in the following website:
>
> https://nppackages.github.io/scpi/

> For an introduction to synthetic control methods, see Abadie (2021) and references
> therein.

Options

┌─── Type of Plot └───

> **scest** if specified **scplot** must be called after scest. Otherwise, it is presumed
> that **scplot** is called after scpi.

> **uncertainty(***string***)** specifies which prediction intervals are plotted. It does not
> affect the plot if **scest** is specified. Options are:
> **insample** prediction intervals quantify only in-sample uncertainty.
> **gaussian** prediction intervals quantify in-sample and out-of-sample uncertainty
> using conditional subgaussian bounds.
> **ls** prediction intervals quantify in-sample and out-of-sample uncertainty
> imposing a location-scale model.
> **qreg** prediction intervals quantify in-sample and out-of-sample uncertainty
> using quantile regressions.

> **ptype(***string***)** specifies the type of plot to be produced. If set to 'treatment',
> then treatment effects are plotted. If set to 'series' (default), the actual
> and synthetic time series are reported.

> **joint** if specified simultaneous prediction intervals are included in the plot(s).

┌─── Scale Options └───

yscalefree if specified each graph has its own scale for the y axis.
xscalefree if specified each graph has its own scale for the x axis.

──────┐ Marker Options └──

These options let the user specify color, size, and form of the markers in the plot.

dots_tr_col(_colorstyle_**)** specifies the color of the markers for the treated unit.
dots_tr_symb(_symbolstyle_**)** specifies the form of the markers for the treated unit.
dots_tr_size(_markersizestyle_**)** specifies the size of the markers for the treated unit.
dots_sc_col(_colorstyle_**)** specifies the color of the markers for the SC unit.
dots_sc_symb(_symbolstyle_**)** specifies the form of the markers for the SC unit.
dots_sc_size(_markersizestyle_**)** specifies the size of the markers for the SC unit.

──────┐ Line Options └──

These options let the user specify color, pattern, and width of the lines in the plot.

line_tr_col(_colorstyle_**)** specifies the color of the line for the treated unit.
line_tr_patt(_linepatternstyle_**)** specifies the pattern of the line for the treated unit.
line_tr_width(_linewidthstyle_**)** specifies the width of the line for the treated unit.
line_sc_col(_colorstyle_**)** specifies the color of the line for the SC unit.
line_sc_patt(_linepatternstyle_**)** specifies the pattern of the line for the SC unit.
line_sc_width(_linewidthstyle_**)** specifies the width of the line for the SC unit.

──────┐ Bar Options └──

These options let the user specify color, pattern, and width of the bar (spikes) in the plot. These options do not have effect if **scest** is specified.

spike_sc_col(_colorstyle_**)** specifies the color of the bars for the SC unit.
spike_sc_patt(_linepatternstyle_**)** specifies the pattern of the bars for the SC unit.
spike_sc_width(_linewidthstyle_**)** specifies the width of the bars for the SC unit.

──────┐ Others └──

gphoptions(_string_**)** specifies additional options to modify individual plots.
gphcombineoptions(_graph combine_**)** specifies additional options to modify the final combined plot.
gphsave(_string_**)** specifies the path and the name of the _.gph_ file that is saved by the command.
savedata(_dta_name_**)** saves a _dta_name.dta_ file containing the processed data used to produce the plot.
keepsingleplots) if specified saves the individual plots in .gph format in the current directory.

pypinocheck) if specified avoids to check that the version of scpi_pkg in Python is the one required by **scplot** in Stata. When not specified performs the check and stores a macro called to avoid checking it multiple times.

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Example: Germany Data

Setup
    . **use scpi_germany.dta**

Prepare data
    . **scdata gdp, dfname("python_scdata") id(country) outcome(gdp) time(year)**
    treatment(status) cointegrated

Estimate Synthetic Control with a simplex constraint and quantify uncertainty
. scpi, dfname("python_scdata") name(simplex) u_missp

Plot Synthetic Control Estimate with Prediction Intervals
. scplot, gphsave("plot_scpi")

References

Abadie, A. 2021. <u>Using synthetic controls: Feasibility, data requirements, and methodological aspects.</u> *Journal of Economic Literature*, 59(2), 391–425.

Cattaneo, M. D., Feng, Y., and Titiunik, R. 2021. <u>Prediction Intervals for Synthetic Sontrol Methods</u>. *Journal of the American Statistical Association*, 116(536), 1865–1880.

Cattaneo, M. D., Feng, Y., Palomba F., and Titiunik, R. 2022. <u>scpi: Uncertainty Quantification for Synthetic Control Estimators,</u> *arXiv*:2202.05984..

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