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) for a single treated unit and Cattaneo, Feng, Palomba, and Titiunik (2023) for multiple treated units and staggered adoption. 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.{p_end

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. Using synthetic controls: Feasibility, data requirements, and methodological aspects. *Journal of Economic Literature*, 59(2), 391–425.

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

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

Cattaneo, M. D., Feng, Y., Palomba F., and Titiunik, R. 2023. Uncertainty Quantification in Synthetic Controls with Staggered Treatment Adoption, *arXiv*:2210.05026.

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