

## 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 to 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.

**ppinocheck**) 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

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#### **Example: Germany Data**

```
Setup
. use scpi_germany.dta

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

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