graph twoway line — Twoway line plots

Syntax

```
[twoway] line varlist [if] [in] [, options]
```

where varlist is

```
y1 [y2[...]] x
```

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`connect_options` discusses options for one `y` versus one `x`; see `connect_options` in [G-2] graph twoway scatter when plotting multiple `y`s against one `x`.

Menu

Graphics > Twoway graph (scatter, line, etc.)

Description

line draws line plots.

line is a command and a plottype as defined in [G-2] graph twoway. Thus the syntax for line is

```
. graph twoway line ...
. twoway line ...
. line ...
```

Being a plottype, `line` may be combined with other plottypes in the `twoway` family (see [G-2] graph twoway), as in

```
. twoway (line ...) (scatter ...) (lfit ...) ...
```

which can equivalently be written as

```
. line ... || scatter ... || lfit ... || ...
```
Options

connect_options specify how the points forming the line are connected and the look of the lines, including pattern, width, and color; see [G-3] connect_options.

[G-3] connect_options discusses options for one y versus one x, see connect_options in [G-2] graph twoway scatter when plotting multiple ys against one x.

axis_choice_options associate the plot with a particular y or x axis on the graph; see [G-3] axis_choice_options.

twoway_options are a set of common options supported by all twoway graphs. These options allow you to title graphs, name graphs, control axes and legends, add lines and text, set aspect ratios, create graphs over by() groups, and change some advanced settings. See [G-3] twoway_options.

Remarks and examples

Remarks are presented under the following headings:

Oneway equivalency of line and scatter
Typical use
Advanced use
Cautions

Oneway equivalency of line and scatter

line is similar to scatter, the differences being that by default the marker symbols are not displayed and the points are connected:

Default msymbol() option: msymbol(none ...)
Default connect() option: connect(l ...)

Thus you get the same results typing

. line yvar xvar

as typing

. scatter yvar xvar, msymbol(none) connect(l)

You can use scatter in place of line, but you may not use line in place of scatter. Typing

. line yvar xvar, msymbol(0) connect(none)

will not achieve the same results as

. scatter yvar xvar

because line, while it allows you to specify the marker_option msymbol(), ignores its setting.
Typical use

line draws line charts:

```
. use http://www.stata-press.com/data/r13/uslifeexp
   (U.S. life expectancy, 1900-1999)
. line le year
```

Line charts work well with time-series data. With other datasets, lines are often used to show predicted values and confidence intervals:

```
. use http://www.stata-press.com/data/r13/auto, clear
   (1978 Automobile Data)
. quietly regress mpg weight
. predict hat
   (option xb assumed; fitted values)
. predict stdf, stdf
. generate lo = hat - 1.96*stdf
. generate hi = hat + 1.96*stdf
. scatter mpg weight || line hat lo hi weight, pstyle(p2 p3 p3) sort
```
Do not forget to include the `sort` option when the data are not in the order of the $x$ variable, as they are not above. We also included `pstyle(p2 p3 p3)` to give the lower and upper confidence limit lines the same look; see Appendix: Styles and composite styles under Remarks and examples in [G-2] graph twoway scatter.

Because `line` is `scatter`, we can use any of the options allowed by `scatter`. Below we return to the U.S. life expectancy data and graph black and white male life expectancies, along with the difference, specifying many options to create an informative and visually pleasing graph:

```
use http://www.stata-press.com/data/r13/uslifeexp, clear
(U.S. life expectancy, 1900–1999)
generate diff = le_wm - le_bm
clabel var diff "Difference"

. line le_wm year, yaxis(1 2) xaxis(1 2)
|| line le_bm year
|| line diff year
|| lfit diff year
||
ylabel(0(5)20, axis(2) gmin angle(horizontal))
ylabel(0 20(10)80, gmax angle(horizontal))
ytitle(, axis(2))
xlabel(1918, axis(2)) xtitle("", axis(2))
ylabel(, axis(2) grid)
ytitle("Life expectancy at birth (years)"

title("White and black life expectancy"

subtitle("USA, 1900–1999"

note("Source: National Vital Statistics, Vol 50, No. 6"

"(1918 dip caused by 1918 Influenza Pandemic")
```

Advanced use

The above graph would look better if we shortened the descriptive text used in the keys. Below we add

\[
\text{legend(label(1 "White males") label(2 "Black males"))}
\]

to our previous command:

\[
. \text{ line le_wm year, yaxis(1 2) xaxis(1 2)} \\
| | \text{ line le_bm year} \\
| | \text{ line diff year} \\
| | \text{ lfit diff year} \\
| | , \\
\text{ ylabel(0(5)20, axis(2) gmin angle(horizontal))} \\
\text{ ylabel(0 20(10)80, gmax angle(horizontal))} \\
\text{ xtitle(1918, axis(2)) xtitle(", axis(2))} \\
\text{ ytitle("Life expectancy at birth (years")}) \\
\text{ title("White and black life expectancy")} \\
\text{ subtitle("USA, 1900–1999")} \\
\text{ note("Source: National Vital Statistics, Vol 50, No. 6"} \\
\text{ "(1918 dip caused by 1918 Influenza Pandemic")}) \\
\text{ legend(label(1 "White males") label(2 "Black males"))}
\]

![Graph showing white and black life expectancy](image.png)

Source: National Vital Statistics, Vol 50, No. 6

(1918 dip caused by 1918 Influenza Pandemic)
We might also consider moving the legend to the right of the graph, which we can do by adding
legend(col(1) pos(3))
resulting in

```
. line le_wm year, yaxis(1 2) xaxis(1 2)
   || line le_bm year
   || line diff year
   || lfit diff year
   ||,
   ylabel(0(5)20, axis(2) gmin angle(horizontal))
   ylabel(0 20(10)80, gmax angle(horizontal))
   ytitle("", axis(2))
   xlabel(1918, axis(2)) xtitle("", axis(2))
   ytitle("Life expectancy at birth (years)")
   title("White and black life expectancy")
   subtitle("USA, 1900−1999")
   note("Source: National Vital Statistics, Vol 50, No. 6"
        "(1918 dip caused by 1918 Influenza Pandemic)"
        legend(label(1 "White males") label(2 "Black males"))
        legend(col(1) pos(3))
```

See [G-3] legend_options for more information about dealing with legends.
Cautions

Be sure that the data are in the order of the $x$ variable, or specify line’s sort option. If you do neither, you will get something that looks like the scribblings of a child:

```
. use http://www.stata-press.com/data/r13/auto, clear
(1978 Automobile Data)
. line mpg weight
```

Also see

[G-2] `graph twoway scatter` — Twoway scatterplots

[G-2] `graph twoway fpfit` — Twoway fractional-polynomial prediction plots

[G-2] `graph twoway lfit` — Twoway linear prediction plots

[G-2] `graph twoway mband` — Twoway median-band plots

[G-2] `graph twoway mspline` — Twoway median-spline plots

[G-2] `graph twoway qfit` — Twoway quadratic prediction plots