graph twoway fpfit — Two-way fractional-polynomial prediction plots

Description

`twoway fpfit` calculates the prediction for *yvar* from estimation of a fractional polynomial of *xvar* and plots the resulting curve.

Quick start

Fractional-polynomial prediction plot of predicted `y` on `x` using `regress`

```
twoway fpfit y x
```

Same as above, but estimate a fractional polynomial of degree 4

```
twoway fpfit y x, estopts(degree(4))
```

Overlaid on a scatterplot of the observed values

```
twoway scatter y x || fpfit y x
```

Same as above, with lines for fractional polynomials of degrees 2 (default) and 4

```
twoway scatter y x || fpfit y x || fpfit y x, estopts(degree(4))
```

A separate graph area for each level of `catvar`

```
twoway scatter y x || fpfit y x, by(catvar)
```

Same as above, but with an additional graph area for all levels of `catvar` combined

```
twoway scatter y x || fpfit y x, by(catvar, total)
```

Overlay lines and data points for `catvar==0` and `catvar==1` in a single graph area

```
twoway scatter y x if catvar==0 || scatter y x if catvar==1 || ///
   fpfit y x if catvar==0 || fpfit y x if catvar==1
```

Specify `poisson` as the estimation command

```
twoway scatter y x || fpfit y x, estcmd(poisson)
```

Menu

Graphics > Two-way graph (scatter, line, etc.)

Syntax

twoway fpfit *yvar xvar* [*if*] [*in*] [*weight*] [, *options*]

options	Description
estcmd(*est_cmd*)	estimation command; default is regress
estopts(*est_opts*)	specifies *est_opts* to estimate the fractional polynomial regression
cline_options	change look of predicted line
axis_choice_options	associate plot with alternative axis
twoway_options	titles, legends, axes, added lines and text, by, regions, name, aspect ratio, etc.

est_cmd may be clogit, glm, intreg, logistic, logit, mlogit, nbreg, ologit, oprobit, poisson, probit, regress, rreg, stcox, stcrreg, streg, or xtgee.

Options estcmd() and estopts() are *unique*; see [G-4] **Concept: repeated options**.

aweights, fweights, and pweights are allowed. Weights, if specified, affect estimation but not how the weighted results are plotted. See [U] **11.1.6 weight**.

est_opts	Description
degree(#)	degree of fractional polynomial to fit; default is degree(2)
noscaling	suppress scaling of first independent variable
noconstant	suppress constant term
powers(*numlist*)	list of fractional polynomial powers from which models are chosen
center(*cent_list*)	specification of centering for the independent variables
all	include out-of-sample observations in generated variables
log	display iteration log
compare	compare models by degree
display_options	control column formats and line width
other_est_opts	other options allowed by *est_cmd*

cent_list is a comma-separated list with elements *varlist*:{mean | # | no}, except that the first element may optionally be of the form {mean | # | no} to specify the default for all variables.

Options

estcmd(*est_cmd*) specifies the estimation command to be used; estcmd(regress) is the default.

estopts(*est_opts*) specifies the options to estimate the fractional polynomial regression from which the curve will be predicted. Available *est_opts* are

degree(#) determines the degree of FP to be fit. The default is degree(2), that is, a model with two power terms.

noscaling suppresses scaling of $xvar_1$ and its powers.

noconstant suppresses the regression constant if this is permitted by *est_cmd*.

`powers(`*numlist*`)` is the set of FP powers from which models are to be chosen. The default is `powers(-2,-1,-.5,0,.5,1,2,3)` (0 means log).

`center(`*cent_list*`)` defines the centering for the covariates $xvar_1$, $xvar_2$, …, *xvarlist*. The default is `center(mean)`. A typical item in *cent_list* is *varlist*`:{mean|#|no}`. Items are separated by commas. The first item is special because *varlist*`:` is optional, and if omitted, the default is (re)set to the specified value (`mean` or # or `no`). For example, `center(no, age:mean)` sets the default to `no` and sets the centering for `age` to `mean`.

`all` includes out-of-sample observations when generating the best-fitting FP powers of $xvar_1$, $xvar_2$, etc. By default, the generated FP variables contain missing values outside the estimation sample.

`log` displays deviances and (for `regress`) residual standard deviations for each FP model fit.

`compare` reports a closed-test comparison between FP models.

display_options: `cformat(`*%fmt*`)`, `pformat(`*%fmt*`)`, `sformat(`*%fmt*`)`, and `nolstretch`; see [R] **Estimation options**.

other_est_opts are options appropriate to the *est_cmd*; see the documentation for that *est_cmd*. For example, for `stcox`, *other_est_opts* may include `efron` or some alternate method for handling tied failures.

cline_options specify how the prediction line is rendered; see [G-3] ***cline_options***.

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***.

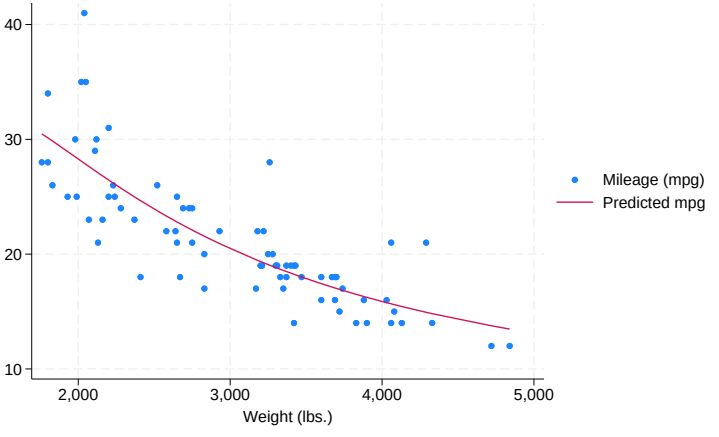
Remarks and examples

Remarks are presented under the following headings:

Typical use

`twoway fpfit` is nearly always used in conjunction with other `twoway` plottypes, such as

```
. use https://www.stata-press.com/data/r19/auto
(1978 automobile data)
. scatter mpg weight || fpfit mpg weight
```



Cautions

Do not use `twoway fpfit` when specifying the *axis_scale_options* `yscale(log)` or `xscale(log)` to create log scales. Typing

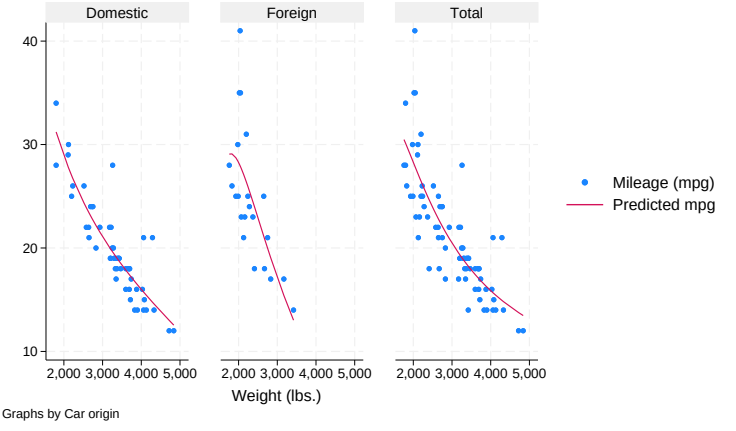
```
. scatter mpg weight, xscale(log) || fpfit mpg weight
```

will produce a curve that will be fit from a fractional polynomial regression of `mpg` on `weight` rather than `log(weight)`.

Use with by()

fpfit may be used with by() (as can all the twoway plot commands):

```
. scatter mpg weight || fpfit mpg weight ||, by(foreign, total row(1))
```



Also see

[G-2] **graph twoway fpfitci** — Two-way fractional-polynomial prediction plots with CIs

[G-2] **graph twoway line** — Two-way line plots

[G-2] **graph twoway lfit** — Two-way linear prediction plots

[G-2] **graph twoway qfit** — Two-way quadratic prediction plots

[G-2] **graph twoway mband** — Two-way median-band plots

[G-2] **graph twoway mspline** — Two-way median-spline plots

Stata, Stata Press, and Mata are registered trademarks of StataCorp LLC. Stata and Stata Press are registered trademarks with the World Intellectual Property Organization of the United Nations. StataNow and NetCourseNow are trademarks of StataCorp LLC. Other brand and product names are registered trademarks or trademarks of their respective companies. Copyright © 1985–2025 StataCorp LLC, College Station, TX, USA. All rights reserved.

For suggested citations, see the FAQ on citing Stata documentation.