Description

graph twoway lpoly plots a local polynomial smooth of \textit{yvar} on \textit{xvar}.

Quick start

Kernel-weighted local polynomial smooth plot of \textit{y} versus \textit{x} with local mean smoothing

\texttt{twoway lpoly y x}

As above, and overlay on a scatterplot to show the observed data

\texttt{twoway scatter y x || lpoly y x}

As above, but with gray markers and a navy blue line

\texttt{twoway scatter y x, mcolor(gray) || lpoly y x, lcolor(navy)}

Specify the half-width of the kernel to be 110

\texttt{twoway scatter y x || lpoly y x, bwidth(110)}

Specify a polynomial of degree 3

\texttt{twoway scatter y x || lpoly y x, degree(3)}

Specify the triangle kernel function

\texttt{twoway scatter y x || lpoly y x, kernel(triangle)}

Show both the triangle and default Epanechnikov kernel functions

\texttt{twoway scatter y x || lpoly y x, kernel(triangle) || lpoly y x}

With a separate graph area for each level of categorical variable \textit{catvar}

\texttt{twoway scatter y x || lpoly y x, by(catvar)}

Menu

Graphics \rightarrow Twoway graph (scatter, line, etc.)
Syntax

```
twoway lpoly yvar xvar [ if ] [ in ] [ weight ] [ , options ]
```

<table>
<thead>
<tr>
<th>options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>kernel(kernel)</code></td>
<td>kernel function; default is <code>kernel(epanechnikov)</code></td>
</tr>
<tr>
<td><code>bwidth(#)</code></td>
<td>kernel bandwidth</td>
</tr>
<tr>
<td><code>degree(#)</code></td>
<td>degree of the polynomial smooth; default is <code>degree(0)</code></td>
</tr>
<tr>
<td><code>n(#)</code></td>
<td>obtain the smooth at # points; default is min(N, 50)</td>
</tr>
<tr>
<td><code>cline_options</code></td>
<td>change look of the line</td>
</tr>
<tr>
<td><code>axis_choice_options</code></td>
<td>associate plot with alternative axis</td>
</tr>
<tr>
<td><code>twoway_options</code></td>
<td>titles, legends, axes, added lines and text, by, regions, name, aspect ratio, etc.</td>
</tr>
</tbody>
</table>

**kernel**

<table>
<thead>
<tr>
<th>kernel</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>epanechnikov</code></td>
<td>Epanechnikov kernel function; the default</td>
</tr>
<tr>
<td><code>epan2</code></td>
<td>alternative Epanechnikov kernel function</td>
</tr>
<tr>
<td><code>biweight</code></td>
<td>biweight kernel function</td>
</tr>
<tr>
<td><code>cosine</code></td>
<td>cosine trace kernel function</td>
</tr>
<tr>
<td><code>gaussian</code></td>
<td>Gaussian kernel function</td>
</tr>
<tr>
<td><code>parzen</code></td>
<td>Parzen kernel function</td>
</tr>
<tr>
<td><code>rectangle</code></td>
<td>rectangle kernel function</td>
</tr>
<tr>
<td><code>triangle</code></td>
<td>triangle kernel function</td>
</tr>
</tbody>
</table>

fweights and aweights are allowed; see [U] 11.1.6 weight.

**Options**

- `kernel(kernel)` specifies the kernel function for use in calculating the weighted local polynomial estimate. The default is `kernel(epanechnikov)`. See [R] kdensity for more information on this option.
- `bwidth(#)` specifies the half-width of the kernel, the width of the smoothing window around each point. If `bwidth()` is not specified, a rule-of-thumb bandwidth estimator is calculated and used; see [R] lpoly.
- `degree(#)` specifies the degree of the polynomial to be used in the smoothing. The default is `degree(0)`, meaning local mean smoothing.
- `n(#)` specifies the number of points at which the smooth is to be calculated. The default is min(N, 50), where N is the number of observations.
- `cline_options` specify how the line is rendered and its appearance; 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

`graph twoway lpoly yvar xvar` uses the `lpoly` command—see `[R] lpoly`—to obtain a local polynomial smooth of `yvar` on `xvar` and uses `graph twoway line` to plot the result.

Remarks are presented under the following headings:

Typical use
Use with by()

Typical use

The local polynomial smooth is often graphed on top of the data, possibly with other smoothers or regression lines:

```
use https://www.stata-press.com/data/r16/auto
(1978 Automobile Data)
.twoway scatter weight length, mcolor(*.6) ||
lpoly weight length ||
lowess weight length
```

![Graph showing data and local polynomial smooth.]

We used `mcolor(*.6)` to dim the points and thus make the lines stand out; see `[G-4] colorstyle`. 
Use with by()

```
. use https://www.stata-press.com/data/r16/auto, clear
(1978 Automobile Data)
. twoway scatter weight length, mcolor(*.6) || lpoly weight length, ||
   , by(foreign)
```

References


Also see

[R] `lpoly` — Kernel-weighted local polynomial smoothing

[G-2] `graph twoway lpolyci` — Local polynomial smooth plots with CIs