serrbar — Graph standard error bar chart

**Description**

`serrbar` is typically used with a dataset containing means, standard deviations or standard errors, and an *xvar*. `serrbar` uses these data to create a standard error bar chart. The means are plotted against *xvar*, and error bars around the means have a width determined by the standard deviation or standard error. While it is most common to use `serrbar` with this type of data, `serrbar` may also be used to create a scatterplot with error bars for other types of data.

**Quick start**

Plot of *y* versus *x* with error bars representing *y* ± *s*

```
  serrbar y s x
```

As above, but with error bars for *y* ± 2 × *s*

```
  serrbar y s x, scale(2)
```

**Menu**

Statistics > Other > Quality control > Standard error bar chart
Syntax

```
serrbar mvar svar xvar [if] [in] [, options]
```

<table>
<thead>
<tr>
<th>options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main</strong></td>
<td>scale(#) controls the length of the bars. The upper</td>
</tr>
<tr>
<td></td>
<td>and lower limits of the bars will be mvar + scale(1)</td>
</tr>
<tr>
<td><strong>Error bars</strong></td>
<td>rcap_options affect the rendition of capped spikes.</td>
</tr>
<tr>
<td><strong>Plotted points</strong></td>
<td>mvoptsscatter_options affect the rendition of</td>
</tr>
<tr>
<td></td>
<td>plotted points (mvar versus xvar). See [G-2]</td>
</tr>
<tr>
<td></td>
<td>graph twoway scatter.</td>
</tr>
<tr>
<td><strong>Add plots</strong></td>
<td>addplot(plot) provides a way to add other plots to</td>
</tr>
<tr>
<td></td>
<td>generated graph; see [G-3] addplot_option.</td>
</tr>
<tr>
<td><strong>Y axis, X axis, Titles, Legend, Overall</strong></td>
<td>twoway_options are any of the options documented in [G-3] twoway_options, excluding by(). These include options for titling the graph (see [G-3] title_options) and for saving the graph to disk (see [G-3] saving_option).</td>
</tr>
</tbody>
</table>

Options

```
scale(#) controls the length of the bars. The upper and lower limits of the bars will be mvar + scale() × svar and mvar − scale() × svar. The default is scale(1).
```

```
rkap_options affect the rendition of the plotted error bars (the capped spikes). See [G-2] graph twoway rcap.
```

```
mvoptsscatter_options affect the rendition of the plotted points (mvar versus xvar). See [G-2] graph twoway scatter.
```

```
addplot(plot) provides a way to add other plots to the generated graph; see [G-3] addplot_option.
```

```
twoway_options are any of the options documented in [G-3] twoway_options, excluding by(). These include options for titling the graph (see [G-3] title_options) and for saving the graph to disk (see [G-3] saving_option).
```
Remarks and examples

Example 1

In quality-control applications, the three most commonly used variables with this command are the process mean, process standard deviation, and time. For instance, we have data on the average weights and standard deviations from an assembly line in San Francisco for the period January 8 to January 16. Our data are

```
use https://www.stata-press.com/data/r16/assembly
list, sep(0) divider
```

<table>
<thead>
<tr>
<th>date</th>
<th>mean</th>
<th>std</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>108</td>
<td>192.22</td>
</tr>
<tr>
<td>2.</td>
<td>109</td>
<td>192.64</td>
</tr>
<tr>
<td>3.</td>
<td>110</td>
<td>192.37</td>
</tr>
<tr>
<td>4.</td>
<td>113</td>
<td>194.76</td>
</tr>
<tr>
<td>5.</td>
<td>114</td>
<td>192.69</td>
</tr>
<tr>
<td>6.</td>
<td>115</td>
<td>195.02</td>
</tr>
<tr>
<td>7.</td>
<td>116</td>
<td>193.40</td>
</tr>
</tbody>
</table>

We type `serrbar mean std date, scale(2)` but, after seeing the result, decide to make it fancier:

```
serrbar mean std date, scale(2) title("Observed Weight Variation")
> sub("San Francisco plant, 1/8 to 1/16") yline(195) yaxis(1 2)
> ylab(195, axis(2)) ytitle("", axis(2))
```

Acknowledgment

`serrbar` was written by Nicholas J. Cox of the Department of Geography at Durham University, UK, and coeditor of the *Stata Journal* and author of *Speaking Stata Graphics.*
Also see

[R] QC — Quality control charts