Title

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graph twoway bar — Twoway bar plots

Description

twoway bar displays numeric (y,x) data as bars. twoway bar is useful for drawing bar plots of time-series data or other equally spaced data and is useful as a programming tool. For finely spaced data, also see [G-2] **graph twoway spike**.

Also see [G-2] **graph bar** for traditional bar charts and [G-2] **graph twoway histogram** for histograms.

Quick start

Bar graph, with bars extending from 0
      twoway bar y x

A horizontal bar graph
      twoway bar y x, horizontal

Bar graph with bars 0.8 times the default width
      twoway bar y x, barwidth(.8)

Bars that extend from 20 rather than 0
      twoway bar y x, base(20)

Add the title "My Title" to the graph
      twoway bar y x, title("My Title")

As above, but add a title "X variable" to the x axis
      twoway bar y x, title("My Title") xtitle("X variable")

As above, but with separate graph areas for each value of catvar
      twoway bar y x, xtitle("X variable") by(catvar, title("My Title"))

Menu

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

Syntax

> <u>tw</u>oway bar *yvar xvar* [*if*] [*in*] [, *options*]

options	Description
<u>vertical</u>	vertical bar plot; the default
<u>horizontal</u>	horizontal bar plot
base(*#*)	value to drop to; default is 0
<u>bar</u>width(*#*)	width of bar in *xvar* units
barlook_options	change look of bars
axis_choice_options	associate plot with alternative axis
twoway_options	titles, legends, axes, added lines and text, by, regions, name, aspect ratio, etc.

Options base() and barwidth() are *rightmost*, and vertical and horizontal are *unique*; see [G-4] **concept: repeated options**.

Options

vertical and horizontal specify either a vertical or a horizontal bar plot. vertical is the default. If horizontal is specified, the values recorded in *yvar* are treated as x values, and the values recorded in *xvar* are treated as y values. That is, to make horizontal plots, do not switch the order of the two variables specified.

In the vertical case, bars are drawn at the specified *xvar* values and extend up or down from 0 according to the corresponding *yvar* values. If 0 is not in the range of the y axis, bars extend up or down to the x axis.

In the horizontal case, bars are drawn at the specified *xvar* values and extend left or right from 0 according to the corresponding *yvar* values. If 0 is not in the range of the x axis, bars extend left or right to the y axis.

base(*#*) specifies the value from which the bar should extend. The default is base(0), and in the above description of options vertical and horizontal, this default was assumed.

barwidth(*#*) specifies the width of the bar in *xvar* units. The default is width(1). When a bar is plotted, it is centered at x, so half the width extends below x and half above.

barlook_options set the look of the bars. The most important of these options is color(*colorstyle*), which specifies the color and opacity of the bars; see [G-4] *colorstyle* for a list of color choices. See [G-3] *barlook_options* for information on the other *barlook_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*
> *Advanced use: Overlaying*
> *Advanced use: Population pyramid*
> *Cautions*

Typical use

We have daily data recording the values for the S&P 500 in 2001:

```
. use http://www.stata-press.com/data/r15/sp500
(S&P 500)

. list date close change in 1/5
```

	date	close	change
1.	02jan2001	1283.27	.
2.	03jan2001	1347.56	64.29004
3.	04jan2001	1333.34	-14.22009
4.	05jan2001	1298.35	-34.98999
5.	08jan2001	1295.86	-2.48999

We will use the first 57 observations from these data:

```
. twoway bar change date in 1/57
```
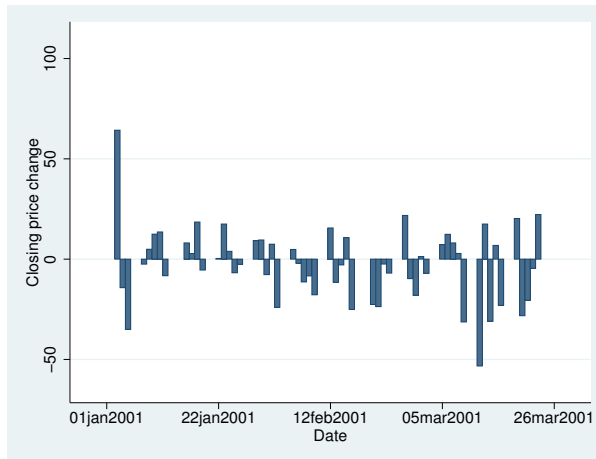
We get a different visual effect if we reduce the width of the bars from 1 day to .6 days:
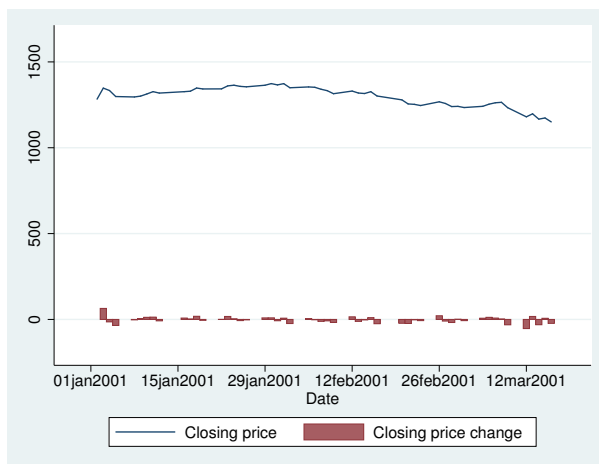
```
. twoway bar change date in 1/57, barw(.6)
```
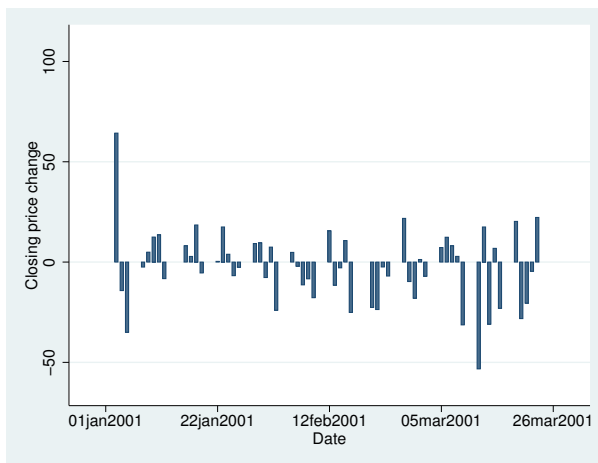

Advanced use: Overlaying

The useful thing about `twoway bar` is that it can be combined with other `twoway` plottypes (see [G-2] **graph twoway**):

```
. twoway line close date || bar change date || in 1/52
```

We can improve this graph by typing

```
. twoway
        line close date, yaxis(1)
   ||
        bar change date, yaxis(2)
   ||
   in 1/52,
        ysca(axis(1) r(1000 1400)) ylab(1200(50)1400, axis(1))
        ysca(axis(2) r(-50 300)) ylab(-50 0 50, axis(2))
                  ytick(-50(25)50, axis(2) grid)
        legend(off)
        xtitle("Date")
        title("S&P 500")
        subtitle("January - March 2001")
        note("Source:  Yahoo!Finance and Commodity Systems, Inc.")
        yline(1150, axis(1) lstyle(foreground))
```
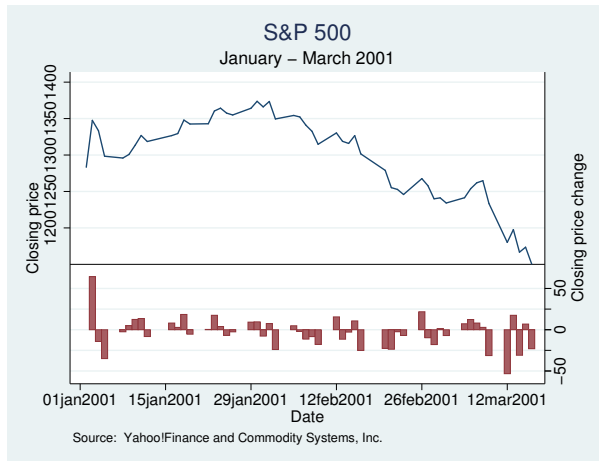

Notice the use of

```
   yline(1150, axis(1) lstyle(foreground))
```

The 1150 put the horizontal line at $y = 1150$; axis(1) stated that y should be interpreted according to the left y axis; and lstyle(foreground) specified that the line be drawn in the foreground style.

Advanced use: Population pyramid

We have the following aggregate data from the U.S. 2000 Census recording total population by age and sex. From this, we produce a population pyramid:

```
. use http://www.stata-press.com/data/r15/pop2000, clear

. list agegrp maletotal femtotal
```

	agegrp	maletotal	femtotal
1.	Under 5	9,810,733	9,365,065
2.	5 to 9	10,523,277	10,026,228
3.	10 to 14	10,520,197	10,007,875
4.	15 to 19	10,391,004	9,828,886
5.	20 to 24	9,687,814	9,276,187
6.	25 to 29	9,798,760	9,582,576
7.	30 to 34	10,321,769	10,188,619
8.	35 to 39	11,318,696	11,387,968
9.	40 to 44	11,129,102	11,312,761
10.	45 to 49	9,889,506	10,202,898
11.	50 to 54	8,607,724	8,977,824
12.	55 to 59	6,508,729	6,960,508
13.	60 to 64	5,136,627	5,668,820
14.	65 to 69	4,400,362	5,133,183
15.	70 to 74	3,902,912	4,954,529
16.	75 to 79	3,044,456	4,371,357
17.	80 to 84	1,834,897	3,110,470

```
. replace maletotal = -maletotal/1e+6
(17 real changes made)

. replace femtotal = femtotal/1e+6
(17 real changes made)

. twoway
        bar maletotal agegrp, horizontal xvarlab(Males)
  ||
        bar  femtotal agegrp, horizontal xvarlab(Females)
  ||
    , ylabel(1(1)17, angle(horizontal) valuelabel labsize(*.8))
      xtitle("Population in millions") ytitle("")
      xlabel(-10 "10" -7.5 "7.5" -5 "5" -2.5 "2.5" 2.5 5 7.5 10)
      legend(label(1 Males) label(2 Females))
      title("US Male and Female Population by Age")
      subtitle("Year 2000")
      note("Source:  U.S. Census Bureau, Census 2000, Tables 1, 2 and 3", span)
```
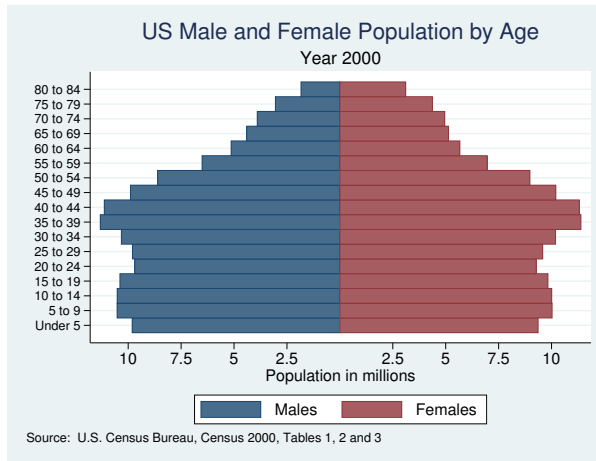
At its heart, the above graph is simple: we turned the bars sideways and changed the male total to be negative. Our first attempt at the above was simply

```
. use http://www.stata-press.com/data/r15/pop2000, clear
. replace maletotal = -maletotal
(17 real changes made)
. twoway bar maletotal agegrp, horizontal ||
         bar  femtotal agegrp, horizontal
```
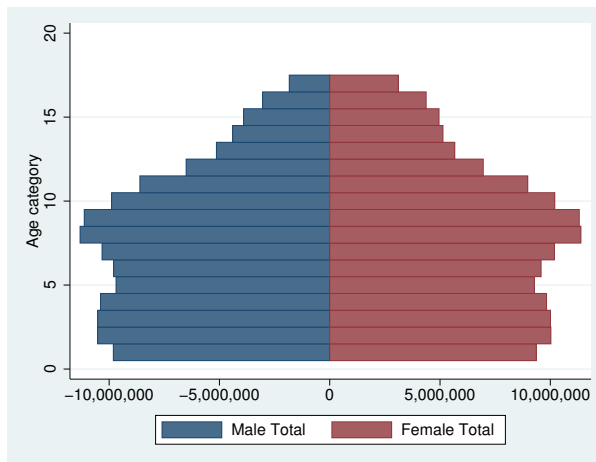

From there, we divided the population totals by 1 million and added options.

`xlabel(-10 "10" -7.5 "7.5" -5 "5" -2.5 "2.5" 2.5 5 7.5 10)` was a clever way to disguise that the bars for males extended in the negative direction. We said to label the values -10, -7.5, -5, -2.5, 2.5, 5, 7.5, and 10, but then we substituted text for the negative numbers to make it appear that they were positive. See [G-3] *axis_label_options*.

Using the `span` suboption to `note()` aligned the text on the left side of the graph rather than on the plot region. See [G-3] *textbox_options*.

For another rendition of the pyramid, we tried

```
. use http://www.stata-press.com/data/r15/pop2000, clear
. replace maletotal = -maletotal/1e+6
(17 real changes made)
. replace femtotal = femtotal/1e+6
(17 real changes made)
. generate zero = 0
. twoway
        bar maletotal agegrp, horizontal xvarlab(Males)
    ||
        bar  femtotal agegrp, horizontal xvarlab(Females)
    ||
        sc  agegrp zero     , mlabel(agegrp) mlabcolor(black) msymbol(i)
    ||
      , xtitle("Population in millions") ytitle("")
  plotregion(style(none))                                       (note 1)
  ysca(noline) ylabel(none)                                     (note 2)
  xsca(noline titlegap(-3.5))                                   (note 3)
  xlabel(-12 "12" -10 "10" -8 "8" -6 "6" -4 "4" 4(2)12 , tlength(0)
                                                 grid gmin gmax)
  legend(label(1 Males) label(2 Females)) legend(order(1 2))
  title("US Male and Female Population by Age, 2000")
  note("Source:  U.S. Census Bureau, Census 2000, Tables 1, 2 and 3")
```
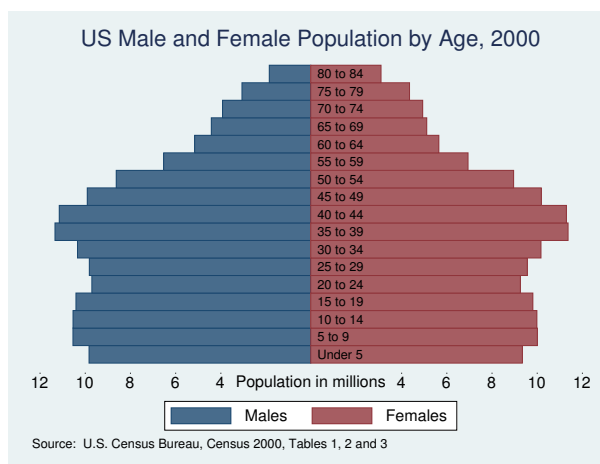

In the above rendition, we moved the labels from the x axis to inside the bars by overlaying a scatter on top of the bars. The points of the scatter we plotted at $y = $ agegrp and $x = 0$, and rather than showing the markers, we displayed marker labels containing the desired labelings. See [G-3] *marker_label_options*.

We also played the following tricks:

1. plotregion(style(none))   suppressed   outlining   the   plot   region;   see [G-3] *region_options*.

2. ysca(noline) suppressed drawing the y axis—see [G-3] *axis_scale_options*—and ylabel(none) suppressed labeling it—see [G-3] *axis_label_options*.

3. xsca(noline titlegap(-3.5)) suppressed drawing the x axis and moved the x-axis title up to be in between its labels; see [G-3] *axis_scale_options*.

Cautions

You must extend the scale of the axis, if that is necessary. Consider using `twoway bar` to produce a histogram (ignoring the better alternative of using `twoway histogram`; see [G-2] **graph twoway histogram**). Assume that you have already aggregated data of the form

x	frequency
1	400
2	800
3	3,000
4	1,800
5	1,100

which you enter into Stata to make variables `x` and `frequency`. You type

```
. twoway bar frequency x
```

to make a histogram-style bar chart. The y axis will be scaled to go between 400 and 3,000 (labeled at 500, 1,000, . . . , 3,000), and the shortest bar will have zero height. You need to type

```
. twoway bar frequency x, ysca(r(0))
```

Reference

Jann, B. 2015. Stata tip 122: Variable bar widths in two-way graphs. *Stata Journal* 15: 316–318.

Also see

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

[G-2] **graph twoway dot** — Twoway dot plots

[G-2] **graph twoway dropline** — Twoway dropped-line plots

[G-2] **graph twoway histogram** — Histogram plots

[G-2] **graph twoway spike** — Twoway spike plots

[G-2] **graph bar** — Bar charts