Stata tip 93: Handling multiple y axes on twoway graphs

Vince Wiggins
StataCorp
College Station, TX
vwiggins@stata.com

Sometimes users find it difficult to handle multiple y axes on their twoway graphs. The main issue is controlling the side of the graph—left or right—where each axis is placed.

Here is a contrived example that exhibits the issue:

```stata
. sysuse auto
   (1978 Automobile Data)
. collapse (mean) mpg trunk, by(length foreign)
. twoway bar mpg length, yaxis(2) ||
   line trunk length, yaxis(1)
```

We might want yaxis(1) to be on the left of the graph and yaxis(2) to be on the right of the graph, but twoway insists on putting yaxis(2) on the left and yaxis(1) on the right. We could achieve what we want by reversing the order of the two plots, but the bars then occlude the lines, and who wants that?

It might be surprising, but the number assigned to an axis has nothing to do with its placement on the graph. twoway places the axes in the order in which it encounters them, with no consideration of their assigned number. How authoritarian! Consider twoway’s problem: when it sees yaxis(2), it cannot be sure that it will ever see a yaxis(1). Moreover, twoway will let you create more than two y axes, and in that case it just stacks them up on the left of the graph like cordwood.
Do not worry. Although we may not like `twoway`’s rules, we can alter them. If we want any axes to appear in a different position, we just tell `twoway` to move them to the alternate (other) side of the graph using the `yscale(alternate)` option. In this example, if we do not like the position of either y axis, we will need to tell each of them to switch to the other side.

```
. twoway bar mpg length, yaxis(2) ||
    line trunk length, yaxis(1) yscale(alternate) yscale(alternate axis(2))
```

We typed just `yscale(alternate)` rather than the more explicit (but still valid) `yscale(alternate axis(1))` because `axis(1)` is the default whenever we do not specify an axis. To alter the side where `axis(2)` appears, we had to be explicit about the axis number and type `yscale(alternate axis(2))`.

If your axis is not where you want it, tell it to alter itself.

1. Acknowledgment

I would like to thank `Stata Journal` editor Nicholas Cox for the initial adaptation of this tip from a Statalist posting, though Nick bears no responsibility for any remaining errors or puns.

---

1. The `Stata Journal` editors, against much stiff opposition, declare this to be the worst pun so far in the history of the `Stata Journal`. 