Description

bicplot graphs the Bayesian information criterion (BIC) function after a lasso fit.

bicplot can be used after lasso, elasticnet, sqrtlasso, telasso, or any of the lasso inference commands.

Quick start

Graph the BIC function after lasso, sqrtlasso, or elasticnet

    bicplot

Graph the BIC function after elasticnet for $\alpha = 0.5$

    bicplot, alpha(.5)

After any of the ds or po commands, graph the BIC function for the dependent variable y

    bicplot, for(y)

After an xpo command without option resample, graph the BIC function for x in cross-fit fold 2

    bicplot, for(x) xfold(2)

After an xpo command with resample, graph the BIC function for x in cross-fit fold 2 for the first resample

    bicplot, for(x) xfold(2) resample(1)

Same as above, but graph the BIC function as a function of the ℓ_1-norm of the standardized coefficient vector

    bicplot, for(x) xfold(2) resample(1) xunits(l1norm)

After telasso, graph the BIC function for the outcome variable y at treatment level 1

    bicplot, for(y) tlevel(1)

Menu

Statistics > Postestimation

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Syntax

After lasso, sqrtlasso, *and* elasticnet

    bicplot [, *options*]

After ds *and* po *commands*

    bicplot, for(*varspec*) [*options*]

After xpo *commands without* resample

    bicplot, for(*varspec*) xfold(#) [*options*]

After xpo *commands with* resample

    bicplot, for(*varspec*) xfold(#) resample(#) [*options*]

After telasso *for the outcome variable*

    bicplot, for(*varspec*) tlevel(#) [*options*]

After telasso *for the treatment variable*

    bicplot, for(*varspec*) [*options*]

After telasso *for the outcome variable with cross-fitting but without* resample

    bicplot, for(*varspec*) tlevel(#) xfold(#) [*options*]

After telasso *for the treatment variable with cross-fitting but without* resample

    bicplot, for(*varspec*) xfold(#) [*options*]

After telasso *for the outcome variable with cross-fitting and* resample

    bicplot, for(*varspec*) tlevel(#) xfold(#) resample(#) [*options*]

After telasso *for the treatment variable with cross-fitting and* resample

    bicplot, for(*varspec*) xfold(#) resample(#) [*options*]

varspec is *varname*, except after poivregress and xpoivregress, when it is either *varname* or pred(*varname*).

options	Description
Main	
xunits(*x_unit_spec*)	x-axis units (scale); default is xunits(rlnlambda), where rlnlambda denotes λ on a reverse logarithmic scale
minmax	add labels for the minimum and maximum x-axis units
* for(*varspec*)	lasso for *varspec*; telasso, ds, po, and xpo commands only
* xfold(#)	lasso for the #th cross-fit fold; xpo commands and telasso with xfolds only
* resample(#)	lasso for the #th resample; xpo commands and telasso with resample only
* tlevel(#)	lasso for the outcome model with the treatment level #; telasso only
alpha(#)	graph BIC function for $\alpha = \#$; default is the selected value α^*; allowed after elasticnet only
lineopts(*cline_options*)	affect rendition of the plotted lines
Reference lines	
biclineopts(*xline_options*)	affect rendition of reference line identifying the minimum of the BIC function or other stopping rule
nobicline	suppress reference line identifying the minimum of the BIC function or other stopping rule
lslineopts(*xline_options*)	affect rendition of reference line identifying the value selected using lassoselect
nolsline	suppress reference line identifying the value selected using lassoselect
rlabelopts(*r_label_opts*)	change look of labels for reference line
Data	
data(*filename* [, replace])	save plot data to *filename*
Y axis, X axis, Titles, Legend, Overall	
twoway_options	any options other than by() documented in [G-3] *twoway_options*

*for(*varspec*) is required for all ds, po, and xpo commands and for telasso.

xfold(#) is required for all xpo commands and for telasso when the option xfolds(#) was specified.

resample(#) is required for xpo and for telasso when the option resample(#) was specified.

tlevel(#) is required for the outcome model in telasso.

x_unit_spec	Description
rlnlambda	λ on a reverse logarithmic scale; the default
lnlambda	λ on a logarithmic scale
l1norm	ℓ_1-norm of standardized coefficient vector
l1normraw	ℓ_1-norm of unstandardized coefficient vector

xline_options	Description
style(*addedlinestyle*)	overall style of added line
[no]extend	[do not] extend line through plot region's margins
lstyle(*linestyle*)	overall style of line
lpattern(*linepatternstyle*)	line pattern (solid, dashed, etc.)
lwidth(*linewidthstyle*)	thickness of line
lcolor(*colorstyle*)	color and opacity of line

r_label_opts	Description
labgap(*size*)	margin between tick and label
labstyle(*textstyle*)	overall style of label
labsize(*textsizestyle*)	size of label
labcolor(*colorstyle*)	color and opacity of label

Options

> Main

xunits(*x_unit_spec*) specifies the x-axis units used for graphing the BIC function. The following *x_unit_spec*s are available:

> rlnlambda specifies x-axis units λ on a reverse logarithmic scale. This is the default.

> lnlambda specifies x-axis units λ on a logarithmic scale.

> l1norm specifies x-axis units ℓ_1-norm of the standardized coefficient vector.

> l1normraw specifies x-axis units ℓ_1-norm of the unstandardized coefficient vector.

minmax adds labels for the minimum and maximum x-axis units to the graph of the BIC function.

for(*varspec*) specifies a particular lasso after telasso or a ds, po, or xpo estimation command fit using the option selection(bic). For all commands except poivregress and xpoivregress, *varspec* is always *varname*; it is either *depvar*, the dependent variable, or one of *varsofinterest* for which inference is done.

> For poivregress and xpoivregress, *varspec* is either *varname* or pred(*varname*). The lasso for *depvar* is specified with its *varname*. For the endogenous variable *varname*, there are two lassos, which can be identified by *varname* and pred(*varname*). The exogenous variables of interest each have only one lasso, and it is specified by pred(*varname*).

> This option is required after ds, po, and xpo commands.

xfold(#) specifies a particular lasso after an xpo estimation command. For each variable to be fit with a lasso, K lassos are done, one for each cross-fit fold, where K is the number of folds. This option specifies which fold, where $\# = 1, 2, \ldots, K$. xfold(#) is required after an xpo command.

resample(#) specifies a particular lasso after an xpo estimation command fit using the option resample(#). For each variable to be fit with a lasso, $R \times K$ lassos are done, where R is the number of resamples and K is the number of cross-fitting folds. This option specifies which resample, where $\# = 1, 2, \ldots, R$. resample(#), along with xfold(#), is required after an xpo command with resampling.

tlevel(#) specifies the lasso for the outcome variable at the specified treatment level after telasso. This option is required to refer to the outcome model after telasso.

alpha(#) graphs the BIC function for $\alpha = \#$. The default is alpha(α^*), where α^* is the selected α. alpha(#) may only be specified after elasticnet.

lineopts(*cline_options*) affects the rendition of the plotted line. See [G-3] *cline_options*.

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⌐ Reference lines ⌐

biclineopts(*xline_options*) affects the rendition of the reference line identifying the minimum BIC value, the value selected when the stopping tolerance is reached, or the grid-minimum value.

xline_options are the following: style(*addedlinestyle*), noextend, lstyle(*linestyle*), lpattern(*linepatternstyle*), lwidth(*linewidthstyle*), and lcolor(*colorstyle*). They specify how the reference line identifying the minimum BIC value is presented. See [G-4] *addedlinestyle*, [G-4] *linestyle*, [G-4] *linepatternstyle*, [G-4] *linewidthstyle*, and [G-4] *colorstyle*.

nobicline suppresses the reference line identifying the minimum BIC value, the value selected when either the stopping tolerance or the grid-minimum value is reached.

lslineopts(*xline_options*) affects the rendition of the reference line identifying the value selected using lassoselect.

xline_options are the following: style(*addedlinestyle*), noextend, lstyle(*linestyle*), lpattern(*linepatternstyle*), lwidth(*linewidthstyle*), and lcolor(*colorstyle*). They specify how the reference line identifying the value selected using lassoselect is presented. See [G-4] *addedlinestyle*, [G-4] *linestyle*, [G-4] *linepatternstyle*, [G-4] *linewidthstyle*, and [G-4] *colorstyle*.

nolsline suppresses the reference line identifying the value selected using lassoselect.

rlabelopts(*r_label_opts*) changes the look of labels for the reference line. The label options labgap(*relativesize*), labstyle(*textstyle*), labsize(*textsizestyle*), and labcolor(*colorstyle*) specify details about how the labels are presented. See [G-4] *size*, [G-4] *textstyle*, [G-4] *textsizestyle*, and [G-4] *colorstyle*.

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⌐ Data ⌐

data(*filename* [, replace]) saves the plot data to a Stata data file.

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⌐ Y axis, X axis, Titles, Legend, Overall ⌐

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 options for saving the graph to disk (see [G-3] *saving_option*).

Remarks and examples

BIC plots graph the BIC function over the search grid for the lasso penalty parameter λ.

The search grid can be shown as the log of the lasso penalty parameter λ, xunits(lnlambda); the reverse of that scale, xunits(rlnlambda); the ℓ_1-norm of the standardized coefficients, xunits(l1norm); or the ℓ_1-norm of the unstandardized coefficients, xunits(l1normraw). The reverse log of lambda is the default because it represents the BIC search path over λ, with the first λ tried on the left and the last λ tried on the right.

BIC plots can be drawn after any command that directly searches over a grid of λ's. They can be drawn after the commands lasso, elasticnet, sqrtlasso, telasso, or any of the 11 lasso inference commands.

Examples that demonstrate how to use bicplot after the lasso command can be found in *BIC* in [LASSO] **lasso examples**.

Also see

[LASSO] **lasso inference postestimation** — Postestimation tools for lasso inferential models

[LASSO] **lasso postestimation** — Postestimation tools for lasso for prediction

[CAUSAL] **telasso postestimation** — Postestimation tools for telasso