qreg postestimation — Postestimation tools for qreg, iqreg, sqreg, and bsqreg

Postestimation commands

The following postestimation command is of special interest after sqreg:

Command	Description
estat coefplot	plot coefficients and their confidence intervals at different quantiles

The following postestimation commands are available after qreg, iqreg, bsqreg, and sqreg:

Command	Description
contrast	contrasts and ANOVA-style joint tests of parameters
estat summarize	summary statistics for the estimation sample
estat vce	variance–covariance matrix of the estimators (VCE)
estimates	cataloging estimation results
etable	table of estimation results
† forecast	dynamic forecasts and simulations
* hausman	Hausman's specification test
lincom	point estimates, standard errors, testing, and inference for linear combinations of parameters
linktest	link test for model specification
margins	marginal means, predictive margins, marginal effects, and average marginal effects
marginsplot	graph the results from margins (profile plots, interaction plots, etc.)
nlcom	point estimates, standard errors, testing, and inference for nonlinear combinations of parameters
predict	predictions and their SEs, residuals, etc.
predictnl	point estimates, standard errors, testing, and inference for generalized predictions
pwcompare	pairwise comparisons of parameters
test	Wald tests of simple and composite linear hypotheses
testnl	Wald tests of nonlinear hypotheses

*hausman is not appropriate after bsqreg, isqreg, or sqreg.

†forecast is not appropriate with mi estimation results.

predict

Description for predict

`predict` creates a new variable containing predictions such as linear predictions, standard errors, and residuals.

Menu for predict

Statistics > Postestimation

Syntax for predict

For qreg, iqreg, and bsqreg

`predict` [*type*] *newvar* [*if*] [*in*] [, [`xb` | `stdp` | `residuals`]]

For sqreg

`predict` [*type*] *newvar* [*if*] [*in*] [, `equation(`*eqno*[,*eqno*]`)` *statistic*]

statistic	Description
Main	
`xb`	linear prediction; the default
`stdp`	standard error of the linear prediction
`stddp`	standard error of the difference in linear predictions
`residuals`	residuals

These statistics are available both in and out of sample; type `predict ... if e(sample) ...` if wanted only for the estimation sample.

Options for predict

Main

`xb`, the default, calculates the linear prediction.

`stdp` calculates the standard error of the linear prediction.

`stddp` is allowed only after you have fit a model using `sqreg`. The standard error of the difference in linear predictions ($\mathbf{x}_{1j}\mathbf{b} - \mathbf{x}_{2j}\mathbf{b}$) between equations 1 and 2 is calculated.

`residuals` calculates the residuals, that is, $y_j - \mathbf{x}_j\mathbf{b}$.

`equation(`*eqno*[,*eqno*]`)` specifies the equation to which you are making the calculation.

`equation()` is filled in with one *eqno* for the `xb`, `stdp`, and `residuals` options. `equation(#1)` would mean that the calculation is to be made for the first equation, `equation(#2)` would mean the second, and so on. You could also refer to the equations by their names. `equation(income)` would refer to the equation named income and `equation(hours)` to the equation named hours.

If you do not specify `equation()`, results are the same as if you had specified `equation(#1)`.

To use `stddp`, you must specify two equations. You might specify `equation(#1, #2)` or `equation(q80, q20)` to indicate the 80th and 20th quantiles.

margins

Description for margins

`margins` estimates margins of response for linear predictions.

Menu for margins

Statistics > Postestimation

Syntax for margins

`margins` [*marginlist*] [`,` *options*]

`margins` [*marginlist*] `,` `predict(`*statistic* `...)` [*options*]

statistic	Description
`xb`	linear prediction; the default
`stdp`	not allowed with `margins`
`stddp`	not allowed with `margins`
`residuals`	not allowed with `margins`

Statistics not allowed with `margins` are functions of stochastic quantities other than `e(b)`.

For the full syntax, see [R] **margins**.

estat

Description for estat

`estat coefplot` plots the estimated coefficients and their confidence intervals (CIs) after `sqreg`.

Menu for estat

Statistics > Postestimation

Syntax for estat

`estat coefplot` [*varname*] [, *options*]

varname is one of the variables specified when fitting `sqreg`; the default is the first endogenous variable.

options	Description
`noci`	do not plot the CIs
`nools`	do not plot the ordinary least-squares (OLS) estimates
Plot	
connect_options	change look of lines or connecting method
marker_options	change look of markers (color, size, etc.)
CI plot	
`ciopts(`*area_options*`)`	affect rendition of the pointwise CIs
Line options	
`lineopts(`*cline_options*`)`	affect rendition of reference line identifying the OLS estimates
Y axis, X axis, Titles, Legend, Overall	
twoway_options	any options other than `by()` documented in [G-3] ***twoway_options***

Options for estat

`noci` removes plots of the pointwise CIs. The default is to plot the CIs.

`nools` removes the plot of the OLS estimates. The default is to plot the OLS reference line.

Plot

connect_options specify how points on a graph are to be connected; [G-3] ***connect_options***.

marker_options affect the rendition of markers drawn at the plotted points, including their shape, size, color, and outline; see [G-3] ***marker_options***.

CI plot

`ciopts(`*area_options*`)` affects rendition of the pointwise CIs; see [G-3] ***area_options***.

Line options

`lineopts(`*cline_options*`)` affects rendition of reference line identifying the OLS estimates; see [G-3] ***cline_options***.

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

Remarks and examples

Example 1: Predictions after qreg and iqreg

In example 4 of [R] **qreg**, we fit regressions for the lower and the upper quartile of the `price` variable. The `predict` command can be used to obtain the linear prediction after each regression.

```
. use https://www.stata-press.com/data/r19/auto
(1978 automobile data)
. qreg price weight length foreign, quantile(.25)
  (output omitted)
. predict q25
(option xb assumed; fitted values)
. qreg price weight length foreign, quantile(.75)
  (output omitted)
. predict q75
(option xb assumed; fitted values)
```

We can use the variables generated by `predict` to compute the predicted interquartile range, that is,

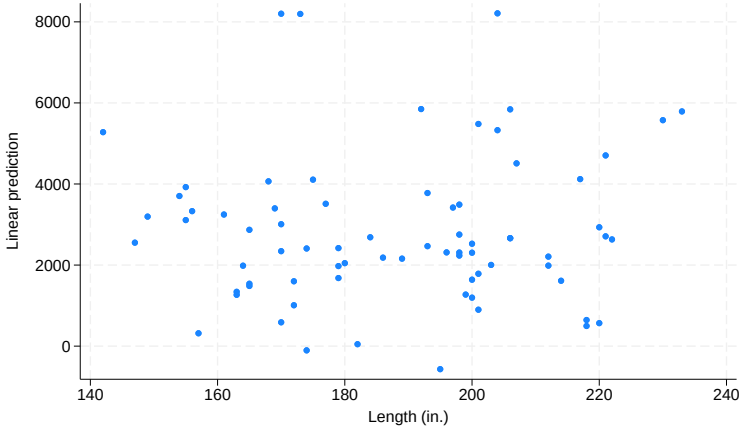
```
. generate iqr1 = q75 - q25
```

If we directly perform the interquartile range regression with the `iqreg` command, we can predict the interquartile range and also the standard error for the prediction.

```
. iqreg price weight length foreign, quantile(.25 .75)
  (output omitted)
. predict iqr2
(option xb assumed; fitted values)
. predict stdp, stdp
```

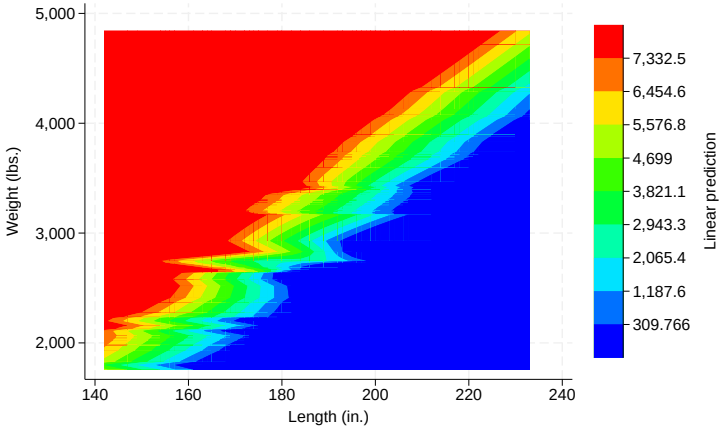
We now plot the predicted interquartile range versus variable length:

```
. scatter iqr2 length
```



As stated in example 5 of [R] **qreg**, the negative coefficient for the `length` variable means that increases in length imply decreases in the interquartile range and therefore in price dispersion. Consequently, we could have expected a downward trend in the plot, but there is not. This is because the regression output indicates that when we hold the rest of the variables constant, an increase in `length` leads to a decrease in `iqr2`. However, there is a high correlation between `weight` and `length`, which could be masking the effect of `length` on `iqr2`. We can achieve a better visualization by using a contour plot.

```
. twoway contour iqr2 weight length, level(10)
```



We can see the effect by setting a fixed value of `length` on the vertical axis, say, 3,000 lbs. When we move from left to right on the horizontal axis, we see that for small values of `length`, `iqr2` values are shown in red, meaning high values, and when we move toward the right, the graph indicates transition into increasingly smaller values.

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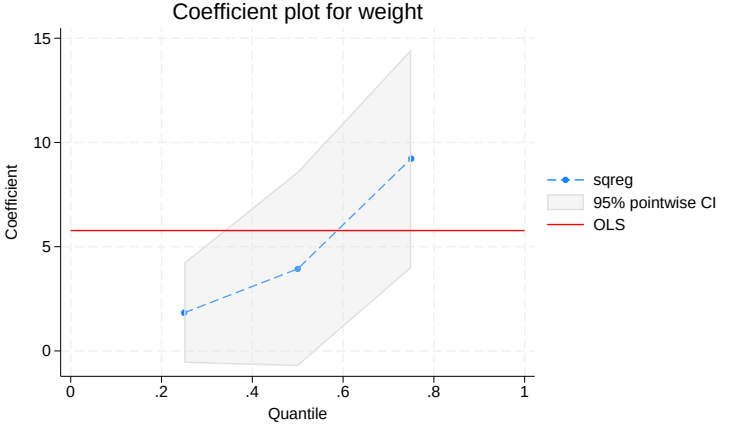
▷ Example 2: Coefficients plot after sqreg

In example 5 of [R] **qreg**, we simultaneously estimated the quantile regressions at different quantile indexes.

```
. use https://www.stata-press.com/data/r19/auto, clear
(1978 automobile data)
. set seed 1001
. sqreg price weight length foreign, q(.25 .5 .75) reps(100)
```
(*output omitted*)

We can now use `estat coefplot` to visualize the coefficients at different quantiles. For example, we can type `estat coefplot weight` to see the trend of the effects of `weight` on `price` across quantiles.

```
. estat coefplot weight
```



The resulting graph shows that there is an upward trend in the effects. For reference, the red line shows the OLS estimates.

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Also see

[R] **qreg** — Quantile regression

[U] 20 Estimation and postestimation commands