hetregress postestimation — Postestimation tools for hetregress

Postestimation commands predict margins Remarks and examples Also see

Postestimation commands

The following postestimation commands are available after `hetregress`:

Command	Description
`contrast`	contrasts and ANOVA-style joint tests of parameters
* `estat ic`	Akaike's, consistent Akaike's, corrected Akaike's, and Schwarz's Bayesian information criteria (AIC, CAIC, AICc, and BIC, respectively)
`estat summarize`	summary statistics for the estimation sample
`estat vce`	variance–covariance matrix of the estimators (VCE)
* `estat (svy)`	postestimation statistics for survey data
`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
*† `lrtest`	likelihood-ratio test
`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`	linear predictions and their SEs, etc.
`predictnl`	point estimates, standard errors, testing, and inference for generalized predictions
`pwcompare`	pairwise comparisons of parameters
* `suest`	seemingly unrelated estimation
`test`	Wald tests of simple and composite linear hypotheses
`testnl`	Wald tests of nonlinear hypotheses

*`estat ic`, `estat` (svy), `lrtest`, and `suest` are not appropriate after `hetregress, twostep`.

†`forecast`, `hausman`, and `lrtest` are not appropriate with `svy` estimation results.

predict

Description for predict

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

Menu for predict

Statistics > Postestimation

Syntax for predict

After ML or two-step

`predict` [*type*] *newvar* [*if*] [*in*] [, *statistic*]

After ML

`predict` [*type*] *stub*`*` [*if*] [*in*], `scores`

statistic	Description
Main	
`xb`	linear prediction; the default
`stdp`	standard error of the linear prediction
`sigma`	standard deviation of the error term

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 errors of the linear prediction.

`sigma` calculates the standard deviations of the error term.

`scores` calculates equation-level score variables.

The first new variable will contain the derivative of the log likelihood with respect to the regression equation, $\partial \ln L/\partial(\mathbf{x}_i\boldsymbol{\beta})$.

The second new variable will contain the derivative of the log likelihood with respect to the scale equation (`lnsigma2`), $\partial \ln L/\partial(\mathbf{z}_i\boldsymbol{\alpha})$.

margins

Description for margins

`margins` estimates margins of response for linear predictions and of standard deviations.

Menu for margins

Statistics > Postestimation

Syntax for margins

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

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

statistic	Description
`xb`	linear prediction; the default
`stdp`	not allowed with `margins`
`sigma`	standard deviation of the error term

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

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

Remarks and examples

Once you have fit a heteroskedastic regression model, you can use the `predict` command to obtain the predicted values both for the estimation sample and for other samples; see **[U] 20 Estimation and postestimation commands** and [R] **predict**. `predict` without arguments calculates the linear prediction from the fitted model $\mathbf{x}_i\mathbf{b}$, where $\mathbf{x}_i$ are the independent variables in the jth observation and $\mathbf{b}$ is the estimated parameter vector for the mean model. With the `stdp` option, `predict` calculates the standard error of the linear prediction. With the `sigma` option, `predict` calculates the predicted standard deviations of the error term, $\widehat{\sigma}_j = \exp(0.5 \times \mathbf{z}_i\mathbf{a})$, where $\mathbf{g}$ is the estimated parameter vector for the variance model.

▷ Example 1: Predicting heteroskedastic standard deviation

We can use `predict` to compute the predicted values of the standard deviations for female and male faculty based on the model from example 2 in [R] **hetregress**.

```
. use https://www.stata-press.com/data/r19/salary
(DeMaris (2004) - Faculty salaries)
. hetregress salary i.female##(c.priorexp c.yrrank c.yrbg c.salfac),
> het(i.female) twostep
  (output omitted)
. predict sigma, sigma
. tabulate female, summarize(sigma)
```

1 = female; 0 = male	Summary of Heteroskedastic standard deviation		
	Mean	Std. dev.	Freq.
0	7741.8481	0	511
1	5828.6973	0	214
Total	7177.1388	873.22924	725

The predicted standard deviation for male faculty is $7742/5829 \approx 1.3$ times the size for female faculty. We could have obtained the same results using `margins` with the `predict(sigma)` option.

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▷ Example 2: Marginal means

We can use `margins` to compute the adjusted mean `salary` for male and female faculty when other factors are fixed at their means:

```
. margins female, atmeans
Adjusted predictions                                    Number of obs = 725
Model VCE: Conventional
Expression: Linear prediction, predict()
At: priorexp =  2.89931 (mean)
    yrrank   = 7.397241 (mean)
    yrbg     = 12.52966 (mean)
    salfac   = .9399862 (mean)
```

	Delta-method Margin	std. err.	z	P>|z|	[95% conf.	interval]
female						
0	49036.29	420.3711	116.65	0.000	48212.37	49860.2
1	43822.74	569.9368	76.89	0.000	42705.69	44939.8

If everyone in the population were male faculty while holding all other factors at their mean values, the average salary would be $49,036. If, instead, everyone were female faculty, the average salary would be $43,823.

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Also see

[R] **hetregress** — Heteroskedastic linear regression

[U] 20 Estimation and postestimation commands