

## Postestimation commands

The following postestimation commands are available after `hetregress`:

Command	Description
<code>contrast</code>	contrasts and ANOVA-style joint tests of parameters
* <code>estat ic</code>	Akaike's, consistent Akaike's, corrected Akaike's, and Schwarz's Bayesian information criteria (AIC, CAIC, AICc, and BIC, respectively)
<code>estat summarize</code>	summary statistics for the estimation sample
<code>estat vce</code>	variance–covariance matrix of the estimators (VCE)
* <code>estat (svy)</code>	postestimation statistics for survey data
<code>estimates</code>	cataloging estimation results
<code>etable</code>	table of estimation results
† <code>forecast</code>	dynamic forecasts and simulations
† <code>hausman</code>	Hausman's specification test
<code>lincom</code>	point estimates, standard errors, testing, and inference for linear combinations of parameters
<code>linktest</code>	link test for model specification
*† <code>lrtest</code>	likelihood-ratio test
<code>margins</code>	marginal means, predictive margins, marginal effects, and average marginal effects
<code>marginsplot</code>	graph the results from margins (profile plots, interaction plots, etc.)
<code>nlcom</code>	point estimates, standard errors, testing, and inference for nonlinear combinations of parameters
<code>predict</code>	linear predictions and their SEs, etc.
<code>predictnl</code>	point estimates, standard errors, testing, and inference for generalized predictions
<code>pwcompare</code>	pairwise comparisons of parameters
* <code>suest</code>	seemingly unrelated estimation
<code>test</code>	Wald tests of simple and composite linear hypotheses
<code>testnl</code>	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  $j$ th 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,  $\hat{\sigma}_j = \exp(0.5 \times \mathbf{z}_i\mathbf{a})$ , 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.



➤ 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.



Also see

[\[R\] hetregress](#) — Heteroskedastic linear regression

## [U] 20 Estimation and postestimation commands

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