

## binreg postestimation — Postestimation tools for binreg

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## Postestimation commands

The following postestimation commands are available after `binreg`:

Command	Description
<code>contrast</code>	contrasts and ANOVA-style joint tests of estimates
* <code>estat ic</code>	Akaike's and Schwarz's Bayesian information criteria (AIC and BIC)
<code>estat summarize</code>	summary statistics for the estimation sample
<code>estat vce</code>	variance–covariance matrix of the estimators (VCE)
<code>estimates</code>	cataloging 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 coefficients
<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 coefficients
<code>predict</code>	predictions, residuals, influence statistics, and other diagnostic measures
<code>predictnl</code>	point estimates, standard errors, testing, and inference for generalized predictions
<code>pwcompare</code>	pairwise comparisons of estimates
<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` and `lrtest` are not appropriate after `binreg`, `irls`.

† `forecast` is not appropriate with `mi` estimation results.

# predict

## Description for predict

`predict` creates a new variable containing predictions such as expected values, linear predictions, standard errors, residuals, Cook's distance, diagonals, weighted averages, differences, and first derivatives.

## Menu for predict

Statistics > Postestimation

## Syntax for predict

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

<i>statistic</i>	Description
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Main

<u>mu</u>	expected value of $y$ ; the default
<u>xb</u>	linear prediction $\eta = \mathbf{x}\hat{\beta}$
<u>eta</u>	synonym for <code>xb</code>
<u>stdp</u>	standard error of the linear prediction
<u>anscombe</u>	<a href="#">Anscombe (1953)</a> residuals
<u>cooksd</u>	Cook's distance
<u>deviance</u>	deviance residuals
<u>hat</u>	diagonals of the "hat" matrix
<u>likelihood</u>	weighted average of the standardized deviance and standard Pearson residuals
<u>pearson</u>	Pearson residuals
<u>response</u>	differences between the observed and fitted outcomes
<u>score</u>	first derivative of the log likelihood with respect to $\mathbf{x}_j\beta$
<u>working</u>	working residuals

<i>options</i>	Description
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Options

<u>nooffset</u>	modify calculations to ignore the offset variable
<u>adjusted</u>	adjust deviance residual to speed up convergence
<u>standardized</u>	multiply residual by the factor $(1 - h)^{1/2}$
<u>studentized</u>	multiply residual by one over the square root of the estimated scale parameter
<u>modified</u>	modify denominator of residual to be a reasonable estimate of the variance of <i>depvar</i>

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

`mu`, the default, specifies that `predict` calculate the expected value of  $y$ , equal to  $g^{-1}(\mathbf{x}\hat{\beta})$  [ $ng^{-1}(\mathbf{x}\hat{\beta})$  for the binomial family].

`xb` calculates the linear prediction  $\eta = \mathbf{x}\hat{\beta}$ .

`eta` is a synonym for `xb`.

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

`anscombe` calculates the [Anscombe \(1953\)](#) residuals to produce residuals that closely follow a normal distribution.

`cooksd` calculates Cook's distance, which measures the aggregate change in the estimated coefficients when each observation is left out of the estimation.

`deviance` calculates the deviance residuals, which are recommended by [McCullagh and Nelder \(1989\)](#) and others as having the best properties for examining goodness of fit of a GLM. They are approximately normally distributed if the model is correct and may be plotted against the fitted values or against a covariate to inspect the model's fit. Also see the `pearson` option below.

`hat` calculates the diagonals of the “hat” matrix, analogous to linear regression.

`likelihood` calculates a weighted average of the standardized deviance and standardized Pearson (described below) residuals.

`pearson` calculates the Pearson residuals, which often have markedly skewed distributions for nonnormal family distributions. Also see the `deviance` option above.

`response` calculates the differences between the observed and fitted outcomes.

`score` calculates the equation-level score,  $\partial \ln L / \partial (\mathbf{x}_j \beta)$ .

`working` calculates the working residuals, which are response residuals weighted according to the derivative of the link function.

## Options

`nooffset` is relevant only if you specified `offset(varname)` for `binreg`. It modifies the calculations made by `predict` so that they ignore the offset variable; the linear prediction is treated as  $\mathbf{x}_j \mathbf{b}$  rather than as  $\mathbf{x}_j \mathbf{b} + \text{offset}_j$ .

`adjusted` adjusts the deviance residual to make the convergence to the limiting normal distribution faster. The adjustment deals with adding to the deviance residual a higher-order term depending on the variance function family. This option is allowed only when `deviance` is specified.

`standardized` requests that the residual be multiplied by the factor  $(1 - h)^{-1/2}$ , where  $h$  is the diagonal of the hat matrix. This step is done to take into account the correlation between `deprvar` and its predicted value.

`studentized` requests that the residual be multiplied by one over the square root of the estimated scale parameter.

`modified` requests that the denominator of the residual be modified to be a reasonable estimate of the variance of `deprvar`. The base residual is multiplied by the factor  $(k/w)^{-1/2}$ , where  $k$  is either one or the user-specified dispersion parameter and  $w$  is the specified weight (or one if left unspecified).

## margins

### Description for margins

`margins` estimates margins of response for expected values and linear predictions.

### Menu for margins

Statistics > Postestimation

### Syntax for margins

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

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

<i>statistic</i>	Description
<u>mu</u>	expected value of $y$ ; the default
<u>xb</u>	linear prediction $\eta = \mathbf{x}\hat{\beta}$
<u>eta</u>	synonym for <code>xb</code>
<u>stdp</u>	not allowed with <code>margins</code>
<u>anscombe</u>	not allowed with <code>margins</code>
<u>cooksd</u>	not allowed with <code>margins</code>
<u>deviance</u>	not allowed with <code>margins</code>
<u>hat</u>	not allowed with <code>margins</code>
<u>likelihood</u>	not allowed with <code>margins</code>
<u>pearson</u>	not allowed with <code>margins</code>
<u>response</u>	not allowed with <code>margins</code>
<u>score</u>	not allowed with <code>margins</code>
<u>working</u>	not allowed with <code>margins</code>

Statistics not allowed with `margins` are functions of stochastic quantities other than  $\mathbf{e}(\mathbf{b})$ .

For the full syntax, see [\[R\] margins](#).

## References

- Anscombe, F. J. 1953. Contribution of discussion paper by H. Hotelling “New light on the correlation coefficient and its transforms”. *Journal of the Royal Statistical Society, Series B* 15: 229–230.
- McCullagh, P., and J. A. Nelder. 1989. *Generalized Linear Models*. 2nd ed. London: Chapman & Hall/CRC.

## Also see

- [\[R\] binreg](#) — Generalized linear models: Extensions to the binomial family
- [\[U\] 20 Estimation and postestimation commands](#)