

**slogit postestimation** — Postestimation tools for slogit

Postestimation commands  
Remarks and examples

predict  
Methods and formulas

margins  
Also see

## Postestimation commands

The following postestimation commands are available after `slogit`:

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>estat (svy)</code>	postestimation statistics for survey data
<code>estimates</code>	cataloging estimation results
<code>etable</code>	table of estimation results
* <code>hausman</code>	Hausman's specification test
<code>lincom</code>	point estimates, standard errors, testing, and inference for linear combinations of coefficients
* <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>	probabilities, 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 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

\*`hausman` and `lrtest` are not appropriate with `svy` estimation results.

# predict

## Description for predict

`predict` creates a new variable containing predictions such as probabilities, indexes for the  $k$ th outcome, and standard errors.

## Menu for predict

Statistics > Postestimation

## Syntax for predict

```
predict [type] { stub* | newvar | newvarlist } [if] [in] [, statistic outcome(outcome)]
```

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

statistic	Description
-----------	-------------

Main

<code>pr</code>	probability of one of or all the dependent variable outcomes; the default
<code>xb</code>	index for the $k$ th outcome
<code>stdp</code>	standard error of the index for the $k$ th outcome

You specify one or  $k$  new variables with `pr`, where  $k$  is the number of outcomes. If you specify one new variable and you do not specify `outcome()`, then `outcome(#1)` is assumed.

You specify one new variable with `xb` and `stdp`. If you do not specify `outcome()`, then `outcome(#1)` is assumed. 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

`pr`, the default, computes the predicted probabilities for all outcomes or for a specific outcome. To compute probabilities for all outcomes, you specify  $k$  new variables, where  $k$  is the number of categories of the dependent variable. Alternatively, you can specify `stub*`; in which case, `pr` will store predicted probabilities in variables `stub1`, `stub2`, ..., `stubk`. To compute the probability for a specific outcome, you specify one new variable and, optionally, the outcome value in option `outcome()`; if you omit `outcome()`, the first outcome value, `outcome(#1)`, is assumed.

Say that you fit a model by typing `estimation_cmd y x1 x2`, and `y` takes on four values. Then, you could type `predict p1 p2 p3 p4` to obtain all four predicted probabilities; alternatively, you could type `predict p*` to generate the four predicted probabilities. To compute specific probabilities one at a time, you can type `predict p1, outcome(#1)` (or simply `predict p1`), `predict p2, outcome(#2)`, and so on. See option `outcome()` for other ways to refer to outcome values.

`xb` calculates the index,  $\theta_k - \sum_{j=1}^d \phi_{jk} \mathbf{x}_i \beta_j$ , for outcome level  $k \neq e(i\_base)$  and dimension  $d = e(k\_dim)$ . It returns a vector of zeros if  $k = e(i\_base)$ . A synonym for `xb` is `index`. If `outcome()` is not specified, `outcome(#1)` is assumed.

`stdp` calculates the standard error of the index. A synonym for `stdp` is `seindex`. If `outcome()` is not specified, `outcome(#1)` is assumed.

`outcome(outcome)` specifies for which outcome the predicted probabilities are to be calculated. `outcome()` should contain either one value of the dependent variable or one of #1, #2, ..., with #1 meaning the first category of the dependent variable, #2 meaning the second category, etc. `outcome()` is not allowed with `scores`.

`scores` calculates the equation-level score variables. For models with  $d$  dimensions and  $m$  levels,  $d + (d + 1)(m - 1)$  new variables are created. Assume  $j = 1, \dots, d$  and  $k = 1, \dots, m$  in the following.

The first  $d$  new variables will contain  $\partial \ln L / \partial (\mathbf{x}\beta_j)$ .

The next  $d(m - 1)$  new variables will contain  $\partial \ln L / \partial \phi_{jk}$ .

The last  $m - 1$  new variables will contain  $\partial \ln L / \partial \theta_k$ .

## margins

### Description for margins

`margins` estimates margins of response for probabilities and indexes for the  $k$ th outcome.

### Menu for margins

Statistics > Postestimation

### Syntax for margins

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

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

<i>statistic</i>	Description
default	probabilities for each outcome
pr	probability of one of or all the dependent variable outcomes
xb	index for the $k$ th outcome
stdp	not allowed with <code>margins</code>

`pr` and `xb` default to the first outcome.

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

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

## Remarks and examples

[stata.com](http://www.stata.com)

Once you have fit a stereotype logistic model, you can obtain the predicted probabilities by using the `predict` command for both the estimation sample and other samples; see [U] [20 Estimation and postestimation commands](#) and [R] [predict](#).

`predict` without arguments (or with the `pr` option) calculates the predicted probability of each outcome of the dependent variable. You must therefore give a new variable name for each of the outcomes. To compute the estimated probability of one outcome, you use the `outcome(outcome)` option where *outcome* is the level encoding the outcome. If the dependent variable's levels are labeled, the outcomes can also be identified by the label values (see [D] [label](#)).

The `xb` option in conjunction with `outcome(outcome)` specifies that the index be computed for the outcome encoded by level *outcome*. Its approximate standard error is computed if the `stdp` option is specified. Only one of the `pr`, `xb`, or `stdp` options can be specified with a call to `predict`.

### ► Example 1

In [example 2](#) of [R] [slomit](#), we fit the one-dimensional stereotype model, where the *depvar* is `insure` with levels  $k = 1$  for outcome *Indemnity*,  $k = 2$  for *Prepaid*, and  $k = 3$  for *Uninsure*. The base outcome for the model is *Indemnity*, so for  $k \neq 1$  the vector of indices for the  $k$ th level is

$$\eta_k = \theta_k - \phi_k (\beta_1 \text{age} + \beta_2 \text{male} + \beta_3 \text{nonwhite} + \beta_4 2.\text{site} + \beta_5 3.\text{site})$$

We estimate the group probabilities by calling `predict` after `slomit`.

```
. use https://www.stata-press.com/data/r17/sysdsn1
(Health insurance data)
. slomit insure age male nonwhite i.site, dim(1) base(1) nolog
(output omitted)
. predict pIndemnity pPrepaid pUninsure, p
. list pIndemnity pPrepaid pUninsure insure in 1/10
```

	pIndem~y	pPrepaid	pUnins~e	insure
1.	.5419344	.3754875	.0825782	Indemnity
2.	.4359638	.496328	.0677081	Prepaid
3.	.5111583	.4105107	.0783309	Indemnity
4.	.3941132	.5442234	.0616633	Prepaid
5.	.4655651	.4625064	.0719285	.
6.	.4401779	.4915102	.0683118	Prepaid
7.	.4632122	.4651931	.0715948	Prepaid
8.	.3772302	.5635696	.0592002	.
9.	.4867758	.4383018	.0749225	Uninsure
10.	.5823668	.3295802	.0880531	Prepaid

Observations 5 and 8 are not used to fit the model because `insure` is missing at these points, but `predict` estimates the probabilities for these observations because none of the independent variables is missing. You can use `if e(sample)` in the call to `predict` to use only those observations that are used to fit the model.



## Methods and formulas

### predict

Let level  $b$  be the base outcome that is used to fit the stereotype logistic regression model of dimension  $d$ . The index for observation  $i$  and level  $k \neq b$  is  $\eta_{ik} = \theta_k - \sum_{j=1}^d \phi_{jk} \mathbf{x}_i \beta_j$ . This is the log odds of outcome encoded as level  $k$  relative to that of  $b$  so that we define  $\eta_{ib} \equiv 0$ . The outcome probabilities for this model are defined as  $\Pr(Y_i = k) = e^{\eta_{ik}} / \sum_{j=1}^m e^{\eta_{ij}}$ . Unlike in `mlogit`, `ologit`, and `oprobit`, the index is no longer a linear function of the parameters. The standard error of index  $\eta_{ik}$  is thus computed using the delta method (see also [R] [predictnl](#)).

The equation-level score for regression coefficients is

$$\frac{\partial \ln L_{ik}}{\partial \mathbf{x}_i \boldsymbol{\beta}_j} = \left( \sum_{l=1}^{m-1} \phi_{jl} p_{il} - \phi_{jk} \right)$$

the equation-level score for the scale parameters is

$$\frac{\partial \ln L_{ik}}{\partial \phi_{jl}} = \begin{cases} \mathbf{x}_i \boldsymbol{\beta}_j (p_{ik} - 1), & \text{if } l = k \\ \mathbf{x}_i \boldsymbol{\beta}_j p_{il}, & \text{if } l \neq k \end{cases}$$

for  $l = 1, \dots, m - 1$ ; and the equation-level score for the intercepts is

$$\frac{\partial \ln L_{ik}}{\partial \theta_l} = \begin{cases} 1 - p_{ik}, & \text{if } l = k \\ -p_{il}, & \text{if } l \neq k \end{cases}$$

## Also see

[R] [slogit](#) — Stereotype logistic regression

[U] [20 Estimation and postestimation commands](#)