xtprobit postestimation — Postestimation tools for xtprobit

Postestimation commands predict margins Remarks and examples Also see

Postestimation commands

The following postestimation commands are available after `xtprobit`:

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)
`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
* `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, probabilities
`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

*`estat ic` and `lrtest` are not appropriate after `xtprobit, pa`.

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

predict

Description for predict

`predict` creates a new variable containing predictions such as linear predictions, probabilities, standard errors, and the equation-level score.

Menu for predict

Statistics > Postestimation

Syntax for predict

Random-effects model

`predict` [*type*] *newvar* [*if*] [*in*] [, *RE_statistic* `nooffset`]

Population-averaged model

`predict` [*type*] *newvar* [*if*] [*in*] [, *PA_statistic* `nooffset`]

RE_statistic	Description
Main	
`xb`	linear prediction; the default
`pr`	marginal probability of a positive outcome
`pu0`	probability of a positive outcome
`stdp`	standard error of the linear prediction

PA_statistic	Description
Main	
`mu`	probability of *depvar*; considers the `offset()`; the default
`rate`	probability of *depvar*
`xb`	linear prediction
`stdp`	standard error of the linear prediction
`score`	first derivative of the log likelihood with respect to $\mathbf{x}_{it}\boldsymbol{\beta}$

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` calculates the linear prediction. This is the default for the random-effects model.

`pr` calculates the probability of a positive outcome that is marginal with respect to the random effect, which means that the probability is calculated by integrating the prediction function with respect to the random effect over its entire support.

`pu0` calculates the probability of a positive outcome, assuming that the random effect for that observation's panel is zero ($\nu_i = 0$). This probability may not be similar to the proportion of observed outcomes in the group.

`mu` and `rate` both calculate the predicted probability of *depvar*. `mu` takes into account the `offset()`, and `rate` ignores those adjustments. `mu` and `rate` are equivalent if you did not specify `offset()`. `mu` is the default for the population-averaged model.

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

`score` calculates the equation-level score, $u_{it} = \partial \ln L(\mathbf{x}_{it}\boldsymbol{\beta})/\partial(\mathbf{x}_{it}\boldsymbol{\beta})$.

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

margins

Description for margins

`margins` estimates margins of response for linear predictions and probabilities.

Menu for margins

Statistics > Postestimation

Syntax for margins

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

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

Random-effects model

statistic	Description
`pr`	marginal probability of a positive outcome; the default
`pu0`	probability of a positive outcome
`xb`	linear prediction
`stdp`	not allowed with `margins`

Population-averaged model

statistic	Description
`mu`	probability of *depvar*; considers the `offset()`; the default
`rate`	probability of *depvar*
`xb`	linear prediction
`stdp`	not allowed with `margins`
`score`	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**.

Remarks and examples

Example 1: Calculating average marginal effects

In example 2 of [XT] **xtprobit**, we fit a population-averaged model of union status on the woman's age and level of schooling, whether she lived in an urban area, whether she lived in the south, and the year observed. Here we compute the average marginal effects from that fitted model on the probability of being in a union.

```
. use https://www.stata-press.com/data/r19/union
(NLS Women 14-24 in 1968)
. xtprobit union age grade i.not_smsa south##c.year, pa
  (output omitted)
. margins, dydx(*)
Average marginal effects                                  Number of obs = 26,200
Model VCE: Conventional
Expression: Pr(union != 0), predict()
dy/dx wrt:  age grade 1.not_smsa 1.south year
```

	dy/dx	Delta-method std. err.	z	P>|z|	[95% conf.	interval]
age	.0025337	.0015035	1.69	0.092	-.0004132	.0054805
grade	.0094109	.0017566	5.36	0.000	.005968	.0128537
1.not_smsa	-.0199744	.0075879	-2.63	0.008	-.0348464	-.0051023
1.south	-.0910805	.0073315	-12.42	0.000	-.10545	-.076711
year	-.000938	.0015413	-0.61	0.543	-.0039589	.0020828

```
Note: dy/dx for factor levels is the discrete change from the base level.
```

On average, not living in a metropolitan area (`not_smsa` = 1) lowers the probability of being in a union by about two percentage points.

Also see

[XT] **xtprobit** — Random-effects and population-averaged probit models

[U] 20 Estimation and postestimation commands