xtnbreg postestimation — Postestimation tools for xtnbreg

Postestimation commands predict margins Methods and formulas Also see

Postestimation commands

The following postestimation commands are available after `xtnbreg`:

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, number of events, incidence rates, 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 `xtnbreg, pa`.

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

predict

Description for predict

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

Menu for predict

Statistics > Postestimation

Syntax for predict

Random-effects (RE) and conditional fixed-effects (FE) overdispersion models

`predict` [*type*] *newvar* [*if*] [*in*] [, *RE/FE_statistic* `nooffset`]

Population-averaged (PA) model

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

RE/FE_statistic	Description
Main	
`xb`	linear prediction; the default
`stdp`	standard error of the linear prediction
`nu0`	predicted number of events; assumes fixed or random effect is zero
`iru0`	predicted incidence rate; assumes fixed or random effect is zero
`pr0(`*n*`)`	probability $\Pr(y = n)$ assuming the random effect is zero; only allowed after `xtnbreg, re`
`pr0(`*a*`,`*b*`)`	probability $\Pr(a \leq y \leq b)$ assuming the random effect is zero; only allowed after `xtnbreg, re`

PA_statistic	Description
Main	
`mu`	predicted number of events; considers the `offset()`; the default
`rate`	predicted number of events
`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 and fixed-effects models.

`mu` and `rate` both calculate the predicted number of events. `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.

`nu0` calculates the predicted number of events, assuming a zero random or fixed effect.

`iru0` calculates the predicted incidence rate, assuming a zero random or fixed effect.

`pr0(`*n*`)` calculates the probability $\Pr(y = n)$ assuming the random effect is zero, where *n* is a nonnegative integer that may be specified as a number or a variable (only allowed after `xtnbreg, re`).

`pr0(`*a*`,`*b*`)` calculates the probability $\Pr(a \leq y \leq b)$ assuming the random effect is zero, where *a* and *b* are nonnegative integers that may be specified as numbers or variables (only allowed after `xtnbreg, re`);

b missing ($b \geq .$) means $+\infty$;
`pr0(20,.)` calculates $\Pr(y \geq 20)$;
`pr0(20,`*b*`)` calculates $\Pr(y \geq 20)$ in observations for which $b \geq .$ and calculates $\Pr(20 \leq y \leq b)$ elsewhere.

`pr0(.,`*b*`)` produces a syntax error. A missing value in an observation on the variable *a* causes a missing value in that observation for `pr0(`*a*`,`*b*`)`.

`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 `xtnbreg`. 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, numbers of events, incidence rates, and probabilities.

Menu for margins

Statistics > Postestimation

Syntax for margins

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

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

Random-effects (RE) and conditional fixed-effects (FE) overdispersion models

statistic	Description
`xb`	linear prediction; the default
`nu0`	predicted number of events; assumes fixed or random effect is zero
`iru0`	predicted incidence rate; assumes fixed or random effect is zero
`pr0(`*n*`)`	probability $\Pr(y = n)$ assuming the random effect is zero; only allowed after `xtnbreg, re`
`pr0(`*a*`,`*b*`)`	probability $\Pr(a \leq y \leq b)$ assuming the random effect is zero; only allowed after `xtnbreg, re`
`stdp`	not allowed with `margins`

Population-averaged (PA) model

statistic	Description
`mu`	predicted number of events; considers the `offset()`; the default
`rate`	predicted number of events
`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**.

Methods and formulas

The probabilities calculated using the `pr0(`n`)` option are the probability $\Pr(y_{it} = n)$ for a RE model assuming the random effect is zero. A negative binomial model is an overdispersed Poisson model, and the nominal overdispersion can be calculated as $\delta = s/(r-1)$, where r and s are as given in the estimation results. Define $\mu_{it} = \exp(\mathbf{x}_{it}\boldsymbol{\beta} + \text{offset}_{it})$. Then the probabilities in `pr0(`n`)` are calculated as the probability that $y_{it} = n$, where y_{it} has a negative binomial distribution with mean $\delta\mu_{it}$ and variance $\delta(1+\delta)\mu_{it}$.

Also see

[XT] **xtnbreg** — Fixed-effects, random-effects, & population-averaged negative binomial models

[U] 20 Estimation and postestimation commands