Title

xtnbreg postestimation — Postestimation tools for xtnbreg

Description

The following postestimation commands are available for `xtnbreg`:

command	description
*`estat`	AIC, BIC, VCE, and estimation sample summary
`estimates`	cataloging estimation results
`hausman`	Hausman's specification test
`lincom`	point estimates, standard errors, testing, and inference for linear combinations of coefficients
`lrtest`	likelihood-ratio test
`margins`	marginal means, predictive margins, marginal effects, and average marginal effects
`nlcom`	point estimates, standard errors, testing, and inference for nonlinear combinations of coefficients
`predict`	predictions, residuals, influence statistics, and other diagnostic measures
`predictnl`	point estimates, standard errors, testing, and inference for generalized predictions
`test`	Wald tests of simple and composite linear hypotheses
`testnl`	Wald tests of nonlinear hypotheses

*`estat ic` is not appropriate after `xtnbreg, pa`.

See the corresponding entries in the *Base Reference Manual* for details.

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*`)`	unconditional probability $\Pr(y_j = n)$ assuming the random effect is zero; only allowed after `xtnbreg, re`
`pr0(`*a*`,`*b*`)`	unconditional probability $\Pr(a \leq y_j \leq b)$ 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 $\mathbf{x}_j\boldsymbol{\beta}$

These statistics are available both in and out of sample; type `predict ... if e(sample) ...` if wanted only for the estimation sample.

Menu

Statistics > Postestimation > Predictions, residuals, etc.

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 unconditional probability $\Pr(y_j = n)$ 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 unconditional probability $\Pr(a \leq y_j \leq b)$ 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 $\Pr(y_j \geq 20)$;
`pr0(20,`*b*`)` calculates $\Pr(y_j \geq 20)$ in observations for which $b \geq .$ and calculates $\Pr(20 \leq y_j \leq b)$ elsewhere.

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

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

`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 $\mathbf{x}_{it}\boldsymbol{\beta} + \text{offset}_{it}$.

Methods and formulas

All postestimation commands listed above are implemented as ado-files.

The probabilities calculated using the `pr0(`*n*`)` option are the unconditional probability $\Pr(y_i = n)$ for a RE model assuming the random effect is zero. These are calculated using

$$\Pr(0|\mathbf{x}_i) = \omega_i + (1 - \omega_i)p_2(0|\mathbf{x}_i)$$

$$\Pr(n|\mathbf{x}_i) = (1 - \omega_i)p_2(n|\mathbf{x}_i) \qquad \text{for } n = 1, 2, \ldots$$

where ω_i is the probability of obtaining an observation from the degenerate distribution whose mass is concentrated at zero, and $p_2(n|\mathbf{x}_i)$ is the probability of $y_i = n$ from the nondegenerate, negative binomial, RE model. ω_i can be obtained from the `pr0()` option.

See Cameron and Trivedi (1998, sec. 4.7) for further details.

Reference

Cameron, A. C., and P. K. Trivedi. 1998. *Regression Analysis of Count Data.* Cambridge: Cambridge University Press.

Also see

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

[U] **20 Estimation and postestimation commands**