**bayes: tpoisson** — Bayesian truncated Poisson regression

**Description**

*bayes: tpoisson* fits a Bayesian truncated Poisson regression to a positive count outcome whose values are all above the truncation point; see [BAYES] *bayes* and [R] *tpoisson* for details.

**Quick start**

Bayesian truncated Poisson regression of \( y \) on \( x_1 \) and \( x_2 \), using a lower truncation limit of 5 and using default normal priors for regression coefficients

\[
\text{bayes: tpoisson } y \ x_1 \ x_2, \ ll(5)
\]

Use a standard deviation of 10 instead of 100 for the default normal priors

\[
\text{bayes, normalprior(10): tpoisson } y \ x_1 \ x_2, \ ll(5)
\]

Use uniform priors for the slopes and a normal prior for the intercept

\[
\begin{align*}
\text{bayes, prior\{y: x_1 \ x_2\}, uniform(-10,10) //} \\
\text{prior\{y:_cons\}, normal(0,10): tpoisson } y \ x_1 \ x_2, \ ll(5)
\end{align*}
\]

Save simulation results to simdata.dta, and use a random-number seed for reproducibility

\[
\text{bayes, saving(simdata) rseed(123): tpoisson } y \ x_1 \ x_2, \ ll(5)
\]

Specify 20,000 MCMC samples, set length of the burn-in period to 5,000, and request that a dot be displayed every 500 simulations

\[
\text{bayes, mcmcsize(20000) burnin(5000) dots(500): tpoisson } y \ x_1 \ x_2, \ ll(5)
\]

In the above, request that the 90% HPD credible interval be displayed instead of the default 95% equal-tailed credible interval

\[
\text{bayes, clevel(90) hpd}
\]

Display incidence-rate ratios instead of coefficients

\[
\text{bayes: tpoisson } y \ x_1 \ x_2, \ ll(5) \ irr
\]

Display incidence-rate ratios on replay

\[
\text{bayes, irr}
\]

Also see Quick start in [BAYES] *bayes* and Quick start in [R] *tpoisson*.

**Menu**

Statistics > Count outcomes > Bayesian regression > Truncated Poisson regression
**Syntax**

```
bayes [, bayesopts] : tpoisson depvar [indepvars] [if] [in] [weight] [, options]
```

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<tr>
<td>ll(#</td>
<td>varname)</td>
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<td>ul(#</td>
<td>varname)</td>
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<td>exposure(varname)</td>
<td>include (\ln(varname)) in model with coefficient constrained to 1</td>
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<td>control spacing, line width, and base and empty cells</td>
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<tr>
<td>level(#)</td>
<td>set credible level; default is level(95)</td>
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</table>

*indevars* may contain factor variables; see [U] 11.4.3 Factor variables.
*depvar* and *indevars* may contain time-series operators; see [U] 11.4.4 Time-series varlists.
*fweight*s are allowed; see [U] 11.1.6 weight.
`bayes: tpoisson, level()` is equivalent to `bayes, clevel(): tpoisson`.
For a detailed description of *options*, see Options in [R] tpoisson.

<table>
<thead>
<tr>
<th>bayesopts</th>
<th>Description</th>
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<tr>
<td>*normalprior(#)</td>
<td>specify standard deviation of default normal priors for regression coefficients; default is normalprior(100)</td>
</tr>
<tr>
<td>prior(priorspec)</td>
<td>prior for model parameters; this option may be repeated</td>
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<td>dryrun</td>
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<tr>
<td><strong>Simulation</strong></td>
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<td>nchains(#)</td>
<td>number of chains; default is to simulate one chain</td>
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<td>mcmcsize(#)</td>
<td>MCMC sample size; default is mcmcsize(10000)</td>
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<td>burnin(#)</td>
<td>burn-in period; default is burnin(2500)</td>
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<tr>
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<td>thinning interval; default is thinning(1)</td>
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<tr>
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<td>random-number seed</td>
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<tr>
<td>exclude(paramref)</td>
<td>specify model parameters to be excluded from the simulation results</td>
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<tr>
<td><strong>Blocking</strong></td>
<td></td>
</tr>
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<td>*blocksize(#)</td>
<td>maximum block size; default is blocksize(50)</td>
</tr>
<tr>
<td>block(paramref[ , blockopts])</td>
<td>specify a block of model parameters; this option may be repeated</td>
</tr>
<tr>
<td>blocksummary</td>
<td>display block summary</td>
</tr>
<tr>
<td>*noblocking</td>
<td>do not block parameters by default</td>
</tr>
</tbody>
</table>
Initialization

**initial**(initspec) specify initial values for model parameters with a single chain
**init#**(initspec) specify initial values for #th chain; requires nchains()
**initall**(initspec) specify initial values for all chains; requires nchains()
**nomleinit** suppress the use of maximum likelihood estimates as starting values
**initrandom** specify random initial values
**initsummary** display initial values used for simulation
* **noisily** display output from the estimation command during initialization

Adaptation

**adaptation**(adaptopts) control the adaptive MCMC procedure
**scale(#)** initial multiplier for scale factor; default is scale(2.38)
**covariance**(cov) initial proposal covariance; default is the identity matrix

Reporting

**clevel(#)** set credible interval level; default is clevel(95)
**hpd** display HPD credible intervals instead of the default equal-tailed credible intervals
* **irr** report incidence-rate ratios
**eform**[(string)] report exponentiated coefficients and, optionally, label as string
**batch(#)** specify length of block for batch-means calculations; default is batch(0)

**saving**(filename[, replace]) save simulation results to filename.dta
**nomodelsummary** suppress model summary
**chainsdetail** display detailed simulation summary for each chain
[ no ] **dots** suppress dots or display dots every 100 iterations and iteration numbers every 1,000 iterations; default is nodots
**dots(#[, every(#)])** display dots as simulation is performed
[ no ] **show**(paramref) specify model parameters to be excluded from or included in the output
**notable** suppress estimation table
**noheader** suppress output header
**title**(string) display string as title above the table of parameter estimates
**display_options** control spacing, line width, and base and empty cells

Advanced

**search**(search_options) control the search for feasible initial values
**corrlag(#)** specify maximum autocorrelation lag; default varies
**corrtol(#)** specify autocorrelation tolerance; default is corrtol(0.01)

*Starred options are specific to the bayes prefix; other options are common between bayes and bayesmh.
Options prior() and block() may be repeated.
**prior** and **paramref** are defined in [BAYES] bayesmh.
**paramref** may contain factor variables; see [U] 11.4.3 Factor variables.
See [U] 20 Estimation and postestimation commands for more capabilities of estimation commands.
Model parameters are regression coefficients \{depvar:indepvars\}. Use the dryrun option to see the definitions of model parameters prior to estimation.
For a detailed description of bayesopts, see Options in [BAYES] bayes.
Remarks and examples

For a general introduction to Bayesian analysis, see [BAYES] Intro. For a general introduction to Bayesian estimation using an adaptive Metropolis–Hastings algorithm, see [BAYES] bayesmh. For remarks and examples specific to the bayes prefix, see [BAYES] bayes. For details about the estimation command, see [R] tpoisson.

For a simple example of the bayes prefix, see Introductory example in [BAYES] bayes. Also see Truncated Poisson regression in [BAYES] bayes.

Stored results

See Stored results in [BAYES] bayes.

Methods and formulas

See Methods and formulas in [BAYES] bayesmh.

Also see

[BAYES] bayes — Bayesian regression models using the bayes prefix
[R] tpoisson — Truncated Poisson regression
[BAYES] Bayesian postestimation — Postestimation tools for bayesmh and the bayes prefix
[BAYES] Bayesian estimation — Bayesian estimation commands
[BAYES] Bayesian commands — Introduction to commands for Bayesian analysis
[BAYES] Intro — Introduction to Bayesian analysis
[BAYES] Glossary