**Description**

`bayes: intreg` fits a Bayesian interval regression to a continuous, interval-measured outcome; see [BAYES] `bayes` and [R] `intreg` for details.

**Quick start**

Bayesian interval regression of `y_lower` and `y_upper` on `x1` and `x2`, using default normal priors for regression coefficients and log-variance

```
bayes: intreg y_lower y_upper x1 x2
```

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

```
bayes, normalprior(10): intreg y_lower y_upper x1 x2
```

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

```
bayes, prior({y_lower: x1 x2}, uniform(-10,10)) ///
      prior({y_lower:_cons}, normal(0,10)): intreg y_lower y_upper x1 x2
```

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

```
bayes, saving(simdata) rseed(123): ///
      intreg y_lower y_upper x1 x2
```

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

```
bayes, mcmcsize(20000) burnin(5000) dots(500): ///
      intreg y_lower y_upper x1 x2
```

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

```
bayes, clevel(90) hpd
```

Also see `Quick start` in [BAYES] `bayes` and `Quick start` in [R] `intreg`.

**Menu**

```
Statistics > Linear models and related > Bayesian regression > Interval regression
```
## Syntax

```
bayes [, bayesopts] : intreg depvar1 depvar2 [ indepvars ] [ if ] [ in ] [ weight ]
[ , options ]
```

### options

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
</tr>
<tr>
<td><strong>noconstant</strong></td>
</tr>
<tr>
<td>suppress constant term</td>
</tr>
<tr>
<td><strong>het(varlist[, noconstant])</strong></td>
</tr>
<tr>
<td>independent variables to model the variance; use noconstant to suppress constant term</td>
</tr>
<tr>
<td><strong>offset(varname)</strong></td>
</tr>
<tr>
<td>include varname in model with coefficient constrained to 1</td>
</tr>
<tr>
<td><strong>Reporting</strong></td>
</tr>
<tr>
<td><strong>display_options</strong></td>
</tr>
<tr>
<td>control spacing, line width, and base and empty cells</td>
</tr>
<tr>
<td><strong>level(#)</strong></td>
</tr>
<tr>
<td>set credible level; default is level(95)</td>
</tr>
</tbody>
</table>

*indepvars* and *varlist* may contain factor variables; see [U] 11.4.3 Factor variables.
*depvar1*, *depvar2*, *indepvars*, and *varlist* may contain time-series operators; see [U] 11.4.4 Time-series varlists.
*weights* are allowed; see [U] 11.1.6 weight.
bayes: intreg, level() is equivalent to bayes, clevel(): intreg.
For a detailed description of *options*, see Options in [R] intreg.

### bayesopts

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priors</strong></td>
</tr>
<tr>
<td><strong>normalprior(#)</strong></td>
</tr>
<tr>
<td>specify standard deviation of default normal priors for regression coefficients and log-variance; default is normalprior(100)</td>
</tr>
<tr>
<td><strong>prior(priorspec)</strong></td>
</tr>
<tr>
<td>prior for model parameters; this option may be repeated</td>
</tr>
<tr>
<td><strong>dryrun</strong></td>
</tr>
<tr>
<td>show model summary without estimation</td>
</tr>
<tr>
<td><strong>Simulation</strong></td>
</tr>
<tr>
<td><strong>nchains(#)</strong></td>
</tr>
<tr>
<td>number of chains; default is to simulate one chain</td>
</tr>
<tr>
<td><strong>mcmcsize(#)</strong></td>
</tr>
<tr>
<td>MCMC sample size; default is mcmcsize(10000)</td>
</tr>
<tr>
<td><strong>burnin(#)</strong></td>
</tr>
<tr>
<td>burn-in period; default is burnin(2500)</td>
</tr>
<tr>
<td><strong>thinning(#)</strong></td>
</tr>
<tr>
<td>thinning interval; default is thinning(1)</td>
</tr>
<tr>
<td><strong>rseed(#)</strong></td>
</tr>
<tr>
<td>random-number seed</td>
</tr>
<tr>
<td><strong>exclude(paramref)</strong></td>
</tr>
<tr>
<td>specify model parameters to be excluded from the simulation results</td>
</tr>
<tr>
<td><strong>Blocking</strong></td>
</tr>
<tr>
<td><strong>blocksize(#)</strong></td>
</tr>
<tr>
<td>maximum block size; default is blocksize(50)</td>
</tr>
<tr>
<td><strong>block(paramref[, blockopts])</strong></td>
</tr>
<tr>
<td>specify a block of model parameters; this option may be repeated display block summary</td>
</tr>
<tr>
<td><strong>noblocking</strong></td>
</tr>
<tr>
<td>do not block parameters by default</td>
</tr>
</tbody>
</table>
Bayes: intreg — Bayesian interval regression

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()
- nomleinitial
  - 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
- 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.

priorspec 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} and log-standard deviation {lnsigma} or, if option het(varlist) is specified, coefficients {lnsigma:varlist} of the log-standard-deviation equation. 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] intreg.

For a simple example of the bayes prefix, see Introductory example 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] intreg — Interval 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