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## Description

`bayes: zilogit` fits a Bayesian zero-inflated ordered logit regression to an ordinal outcome with a high fraction of zeros; see [\[BAYES\] bayes](#) and [\[R\] zilogit](#) for details.

## Quick start

Bayesian zero-inflated ordered logit regression of  $y$  on  $x_1$  and  $x_2$ , using  $z$  to model excess zeros and using default normal priors for regression coefficients and flat priors for cutpoints

```
bayes: zilogit y x1 x2, inflate(z)
```

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

```
bayes, normalprior(10): zilogit y x1 x2, inflate(z)
```

Use uniform priors for the slopes and a normal prior for the intercept of the main regression

```
bayes, prior({y: x1 x2}, uniform(-10,10)) ///  
prior({y: _cons}, normal(0,10)): zilogit y x1 x2, inflate(z)
```

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

```
bayes, saving(simdata) rseed(123): ///  
zilogit y x1 x2, inflate(z)
```

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

```
bayes, mcmcsample(20000) burnin(5000) dots(500): ///  
zilogit y x1 x2, inflate(z)
```

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

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

Display odds ratios instead of coefficients on replay

```
bayes, or
```

Also see [Quick start](#) in [\[BAYES\] bayes](#) and [Quick start](#) in [\[R\] zilogit](#).

## Menu

Statistics > Ordinal outcomes > Bayesian regression > Zero-inflated ordered logit regression

## Syntax

```
bayes [ , bayesopts ] : zilogit depvar [indepvars] [if] [in] [weight] ,
  inflate(varlist [ , noconstant offset(varname) ] | _cons) [options]
```

<i>options</i>	Description
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Model	
* <u>inflate</u> ( ) <u>offset</u> ( <i>varname</i> )	inflation equation that determines excess zero values include <i>varname</i> in model with coefficient constrained to 1
Reporting	
or <u>display_options</u>	report odds ratios control spacing, line width, and base and empty cells
<u>level</u> (#)	set credible level; default is level(95)

\*inflate(*varlist*[ , noconstant offset(*varname*) ] | \_cons) is required.  
*indepvars* and *varlist* may contain factor variables; see [U] 11.4.3 Factor variables.  
*fweights* are allowed; see [U] 11.1.6 weight.  
 bayes: zilogit, level() is equivalent to bayes, clevel(): zilogit.  
 For a detailed description of *options*, see *Options* in [R] zilogit.

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

#### Initialization

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

#### Adaptation

<code><u>adaptation</u>(<i>adaptopts</i>)</code>	control the adaptive MCMC procedure
<code><u>scale</u>(#)</code>	initial multiplier for scale factor; default is <code>scale(2.38)</code>
<code><u>covariance</u>(<i>cov</i>)</code>	initial proposal covariance; default is the identity matrix

#### Reporting

<code><u>clevel</u>(#)</code>	set credible interval level; default is <code>clevel(95)</code>
<code><u>hpd</u></code>	display HPD credible intervals instead of the default equal-tailed credible intervals
* <code><u>or</u></code>	report odds ratios
<code><u>eform</u>[ (<i>string</i>) ]</code>	report exponentiated coefficients and, optionally, label as <i>string</i>
<code><u>batch</u>(#)</code>	specify length of block for batch-means calculations; default is <code>batch(0)</code>
<code><u>saving</u>(<i>filename</i>[ , replace ])</code>	save simulation results to <i>filename.dta</i>
<code><u>nomodelsummary</u></code>	suppress model summary
<code><u>chainsdetail</u></code>	display detailed simulation summary for each chain
<code>[ no ]dots</code>	suppress dots or display dots every 100 iterations and iteration numbers every 1,000 iterations; default is <code>nodots</code>
<code>dots(#[ , every(#) ])</code>	display dots as simulation is performed
<code>[ no ]show(<i>paramref</i>)</code>	specify model parameters to be excluded from or included in the output
<code><u>notable</u></code>	suppress estimation table
<code><u>noheader</u></code>	suppress output header
<code><u>title</u>(<i>string</i>)</code>	display <i>string</i> as title above the table of parameter estimates
<code><u>display_options</u></code>	control spacing, line width, and base and empty cells

#### Advanced

<code><u>search</u>(<i>search_options</i>)</code>	control the search for feasible initial values
<code><u>corrlag</u>(#)</code>	specify maximum autocorrelation lag; default varies
<code><u>corrtol</u>(#)</code>	specify autocorrelation tolerance; default is <code>corrtol(0.01)</code>

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\* 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**.

`collect` is allowed; see [U] 11.1.10 **Prefix commands**.

See [U] 20 **Estimation and postestimation commands** for more capabilities of estimation commands.

Model parameters are regression coefficients `{depvar:indepvars}` for the main regression and `{inflate:varlist}` for the inflation equation and cutpoints `{cut1}`, `{cut2}`, and so on. Use the `dryrun` option to see the definitions of model parameters prior to estimation.

Flat priors, `flat`, are used by default for cutpoints.

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] **zilogit**.

For a simple example of the `bayes` prefix, see *Introductory example* in [BAYES] **bayes**. Also see *Zero-inflated negative binomial models* 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] **zilogit** — Zero-inflated ordered logit regression

[BAYES] **Bayesian postestimation** — Postestimation tools after Bayesian estimation

[BAYES] **Bayesian estimation** — Bayesian estimation commands

[BAYES] **Bayesian commands** — Introduction to commands for Bayesian analysis

[BAYES] **Intro** — Introduction to Bayesian analysis

[BAYES] **Glossary**

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