ERM options — Extended regression model options

Description

This entry describes the options that are common to the extended regression commands; see [ERM] **eregress**, [ERM] **eprobit**, [ERM] **eoprobit**, and [ERM] **eintreg**.

Syntax

> *erm_cmd* ... [, *extensions options*]

erm_cmd is one of eregress, eprobit, eoprobit, eintreg, xteregress, xteprobit, xteoprobit, or xteintreg

extensions	Description
Model	
endogenous(*enspec*)	model for endogenous covariates; may be repeated
entreat(*entrspec*)	model for endogenous treatment assignment
extreat(*extrspec*)	exogenous treatment
select(*selspec*)	probit model for selection
tobitselect(*tselspec*)	tobit model for selection

options	Description
Model	
<u>noc</u>onstant	suppress constant term
<u>off</u>set(*varname$_o$*)	include *varname$_o$* in model with coefficient constrained to 1
<u>constra</u>ints(*numlist*)	apply specified linear constraints
SE/Robust	
vce(*vcetype*)	*vcetype* may be oim, <u>r</u>obust, <u>cl</u>uster *clustvar*, opg, <u>boot</u>strap, or jackknife
Reporting	
<u>l</u>evel(*#*)	set confidence level; default is level(95)
nocnsreport	do not display constraints
display_options	control columns and column formats, row spacing, line width, display of omitted variables and base and empty cells, and factor-variable labeling
Integration	
<u>intp</u>oints(*#*)	set the number of integration (quadrature) points for integration over four or more dimensions; default is intpoints(128)
<u>triintp</u>oints(*#*)	set the number of integration (quadrature) points for integration over three dimensions; default is triintpoints(10)
<u>reintp</u>oints(*#*)	set the number of integration (quadrature) points for random-effects integration; default is reintpoints(7)
<u>reintm</u>ethod(*intmethod*)	integration method for random effects; *intmethod* may be <u>mvag</u>hermite (the default) or <u>g</u>hermite
Maximization	
maximize_options	control the maximization process; seldom used
<u>collin</u>ear	keep collinear variables
coeflegend	display legend instead of statistics

reintpoints() and reintmethod() are available only with xteregress, xteintreg, xteprobit, and xteoprobit.

collinear and coeflegend do not appear in the dialog box.

enspec is *depvars*$_{en}$ = *varlist*$_{en}$ [, *enopts*]

   where *depvars*$_{en}$ is a list of endogenous covariates. Each variable in *depvars*$_{en}$ specifies an endogenous covariate model using the common *varlist*$_{en}$ and options.

entrspec is *depvar*$_{tr}$[= *varlist*$_{tr}$] [, *entropts*]

   where *depvar*$_{tr}$ is a variable indicating treatment assignment. *varlist*$_{tr}$ is a list of covariates predicting treatment assignment.

extrspec is *tvar* [, *extropts*]

   where *tvar* is a variable indicating treatment assignment.

selspec is *depvar*$_s$ = *varlist*$_s$ [, *selopts*]

   where *depvar*$_s$ is a variable indicating selection status. *depvar*$_s$ must be coded as 0, indicating that the observation was not selected, or 1, indicating that the observation was selected. *varlist*$_s$ is a list of covariates predicting selection.

tselspec is *depvar*$_s$ = *varlist*$_s$ [, *tselopts*]

> where *depvar*$_s$ is a continuous variable. *varlist*$_s$ is a list of covariates predicting *depvar*$_s$. The cen-
> soring status of *depvar*$_s$ indicates selection, where a censored *depvar*$_s$ indicates that the observation
> was not selected and a noncensored *depvar*$_s$ indicates that the observation was selected.

enopts	Description
Model	
probit	treat endogenous covariate as binary
oprobit	treat endogenous covariate as ordinal
povariance	estimate a different variance for each level of a binary or an ordinal endoge-nous covariate
pocorrelation	estimate different correlations for each level of a binary or an ordinal en-dogenous covariate
nomain	do not add endogenous covariate to main equation
nore	do not include random effects in model for endogenous covariate
noconstant	suppress constant term

povariance is available only with eregress, eintreg, xteregress, and xteintreg.

nore is available only with xteregress, xteintreg, xteprobit, and xteoprobit.

entropts	Description
Model	
povariance	estimate a different variance for each potential outcome
pocorrelation	estimate different correlations for each potential outcome
nomain	do not add treatment indicator to main equation
nocutsinteract	do not interact treatment with cutpoints
nointeract	do not interact treatment with covariates in main equation
nore	do not include random effects in model for endogenous treatment
noconstant	suppress constant term
offset(*varname*$_o$)	include *varname*$_o$ in model with coefficient constrained to 1

povariance is available only with eregress, eintreg, xteregress, and xteintreg.

nocutsinteract is available only with eoprobit.

nore is available only with xteregress, xteintreg, xteprobit, and xteoprobit.

extropts	Description
Model	
povariance	estimate a different variance for each potential outcome
pocorrelation	estimate different correlations for each potential outcome
nomain	do not add treatment indicator to main equation
nocutsinteract	do not interact treatment with cutpoints
nointeract	do not interact treatment with covariates in main equation

povariance is available only with eregress, eintreg, xteregress, and xteintreg.

nocutsinteract is available only with eoprobit.

selopts	Description
Model	
nore	do not include random effects in selection model
noconstant	suppress constant term
<u>off</u>set(*varname_o*)	include *varname_o* in model with coefficient constrained to 1

nore is available only with xteregress, xteintreg, xteprobit, and xteoprobit.

tselopts	Description
Model	
* ll(*varname* | #)	left-censoring variable or limit
* ul(*varname* | #)	right-censoring variable or limit
main	add censored selection variable to main equation
nore	do not include random effects in tobit selection model
noconstant	suppress constant term
<u>off</u>set(*varname_o*)	include *varname_o* in model with coefficient constrained to 1

* You must specify either ll() or ul().

nore is available only with xteregress, xteintreg, xteprobit, and xteoprobit.

Options

    Model

endogenous(*depvars_en* = *varlist_en* [, *enopts*]) specifies the model for endogenous covariates. *depvars_en* is a list of one or more endogenous covariates modeled with *varlist_en*. This option may be repeated to allow a different model specification for each endogenous covariate. By default, the endogenous covariates are assumed to be continuous, and a linear Gaussian model is used. Unless the nomain suboption is specified, the variables specified in *depvars_en* are automatically included in the main equation. The following *enopts* are available:

probit specifies to use a probit model for the endogenous covariates. probit may not be specified with oprobit; however, you may specify endogenous(..., probit) and endogenous(..., oprobit).

oprobit specifies to use an ordered probit model for the endogenous covariates. oprobit may not be specified with probit; however, you may specify endogenous(..., probit) and endogenous(..., oprobit).

povariance specifies that different variance parameters be estimated for each level of the endogenous covariates. In a treatment-effects framework, we refer to levels of endogenous covariates as potential outcomes, and povariance specifies that the variance be estimated separately for each potential outcome. povariance may be specified only with eregress and eintreg and with a binary or an ordinal endogenous covariate.

pocorrelation specifies that different correlation parameters be estimated for each level of the endogenous covariates. In a treatment-effects framework, we refer to levels of endogenous covariates as potential outcomes, and pocorrelation specifies that correlations be estimated separately for each potential outcome. pocorrelation may be specified only with a binary or an ordinal endogenous covariate.

nomain specifies that the endogenous covariate of covariates be excluded from the main model, thus removing the effect. This option is for those who intend to manually construct the effect by adding it to the main model in their own way.

nore specifies that random effects not be included in the equations for the endogenous covariates.

noconstant suppresses the constant term (intercept) in the model for the endogenous covariates.

entreat() and extreat() specify a model for treatment assignment. You may specify only one.

entreat($depvar_{tr}$ [= $varlist_{tr}$] [, $trtopts$ $modopts$]) specifies a model for endogenous treatment assignment with $depvar_{tr} = 1$ indicating treatment and $depvar_{tr} = 0$ indicating no treatment. $varlist_{tr}$ are the covariates for the treatment model; they are optional.

extreat($depvar_{tr}$ [, $trtopts$]) specifies a variable that signals exogenous treatment. $depvar_{tr} = 1$ indicates treatment and $depvar_{tr} = 0$ indicates no treatment.

trtopts are

povariance specifies that different variance parameters be estimated for each potential outcome (for each treatment level). povariance may be specified only with eregress and eintreg.

pocorrelation specifies that different correlation parameters be estimated for each potential outcome (for each treatment level).

nomain, nocutsinteract, and nointeract affect the way the treatment enters the main equation.

nomain specifies that the main effect of treatment be excluded from the main equation. Thus, a separate intercept is not estimated for each treatment level. In the case of eoprobit, this means separate cutpoints are not added.

nocutsinteract specifies that instead of the default of having separate cutpoints for each treatment level, you get one set of cutpoints that are shifted by a constant value for each treatment level. This is implemented by placing a separate constant in the main equation for each treatment level. nocutsinteract is available only with eoprobit.

nointeract specifies that the treatment variable not be interacted with the other covariates in the main equation.

These options allow you to customize how the treatment enters the main equation. When nomain and nointeract are specified together, they remove the effect entirely, and you will need to explicitly reintroduce the treatment effect.

modopts are

nore specifies that a random effect not be included in the treatment equation.

noconstant suppresses the constant term (intercept) in the treatment model.

offset($varname_o$) specifies that $varname_o$ be included in the treatment model with the coefficient constrained to 1.

select() and tobitselect() specify a model for endogenous sample selection. You may specify only one.

select($depvar_s$ = $varlist_s$ [, $modopts$]) specifies a probit model for sample selection with $varlist_s$ as the covariates for the selection model. When $depvar_s = 1$, the model's dependent variable is treated as observed (selected); when $depvar_s = 0$, it is treated as unobserved (not selected).

tobitselect(*depvar$_s$* = *varlist$_s$* [, ll(*varname* | #) ul(*varname* | #) main *modopts*]) specifies a tobit model for sample selection with *depvar$_s$* as a censored selection variable and *varlist$_s$* as the covariates for the selection model.

  ll(*arg*) specifies that when *depvar$_s$* $\leq$ *arg*, the selection variable is treated as censored and the model's dependent variable is unobserved (not selected).

  ul(*arg*) specifies that when *depvar$_s$* $\geq$ *arg*, the selection variable is treated as censored and the model's dependent variable is unobserved (not selected).

  main specifies that the censored selection variable be included as a covariate in the main equation. By default, it is excluded from the main equation.

  Only the uncensored values of the selection variable contribute to the likelihood through the main equation. Thus, the selection variable participates as though it were uncensored.

modopts are

  nore specifies that a random effect not be included in the selection equation.

  noconstant suppresses the constant term (intercept) in the selection model.

  offset(*varname$_o$*) specifies that *varname$_o$* be included in the selection model with the coefficient constrained to 1.

noconstant, offset(*varname$_o$*), constraints(*numlist*); see [R] **Estimation options**.

___

| SE/Robust |

vce(*vcetype*) specifies the type of standard error reported, which includes types that are derived from asymptotic theory (oim, opg), that are robust to some kinds of misspecification (robust), that allow for intragroup correlation (cluster *clustvar*), and that use bootstrap or jackknife methods (bootstrap, jackknife); see [R] *vce_option*.

___

| Reporting |

level(#), nocnsreport; see [R] **Estimation options**.

display_options: noci, nopvalues, noomitted, vsquish, noemptycells, baselevels, allbaselevels, nofvlabel, fvwrap(#), fvwrapon(*style*), cformat(*%fmt*), pformat(*%fmt*), sformat(*%fmt*), and nolstretch; see [R] **Estimation options**.

___

| Integration |

intpoints(#) and triintpoints(#) control the number of integration (quadrature) points used to approximate multivariate normal probabilities in the likelihood and scores.

  intpoints() sets the number of integration (quadrature) points for integration over four or more dimensions. The number of integration points must be between 3 and 5,000. The default is intpoints(128).

  triintpoints() sets the number of integration (quadrature) points for integration over three dimensions. The number of integration points must be between 3 and 5,000. The default is triintpoints(10).

  When four dimensions of integration are used in the likelihood, three will be used in the scores. The algorithm for integration over four or more dimensions differs from the algorithm for integration over three dimensions.

`reintpoints(#)` and `reintmethod(intmethod)` control how the integration of random effects is numerically calculated.

> `reintpoints()` sets the number of integration (quadrature) points used for integration of the random effects. The default is `intpoints(7)`. Increasing the number increases accuracy but also increases computational time. Computational time is roughly proportional to the number specified. See *Likelihood for multiequation models* in [ERM] **eprobit** for more details.

> `reintmethod()` specifies the integration method. The default method is mean–variance adaptive Gauss–Hermite quadrature, `reintmethod(mvaghermite)`. We recommend this method. `reintmethod(ghermite)` specifies that nonadaptive Gauss–Hermite quadrature be used. This method is less computationally intensive and less accurate. It is sometimes useful to try `reintmethod(ghermite)` to get the model to converge and then perhaps use the results as initial values specified in option `from` when fitting the model using the more accurate `intmethod(mvaghermite)`. See *Likelihood for multiequation models* in [ERM] **eprobit** for more details.

> ⎡ Maximization ⎤

maximize_options: `difficult`, `technique(algorithm_spec)`, `iterate(#)`, [`no`]`log`, `trace`, `gradient`, `showstep`, `hessian`, `showtolerance`, `tolerance(#)`, `ltolerance(#)`, `nrtolerance(#)`, `nonrtolerance`, and `from(init_specs)`; see [R] **Maximize**.

> The default technique for `eintreg`, `eoprobit`, `eprobit`, and `eregress` is `technique(nr)`. The default technique for `xteintreg`, `xteoprobit`, `xteprobit`, and `xteregress` is `technique(bhhh 10 nr 2)`.

> Setting the optimization type to `technique(bhhh)` resets the default *vcetype* to `vce(opg)`.

The following option is available with *erm_cmd* but is not shown in the dialog box:

`collinear`, `coeflegend`; see [R] **Estimation options**.

Also see

For suggested citations, see the FAQ on citing Stata documentation.