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Intro — Introduction to extended regression models manual

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Description

ERM stands for extended regression model. The ERMs are linear regression, interval regression, probit, and ordered probit. This manual introduces, explains, and documents ERM features.

Remarks and examples

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The entries in this manual are organized as follows:

Introductions

Read the introductions first.

We recommend reading [ERM] **Intro 1**–[ERM] **Intro 7** in order. In them, you will find introductions to the models that can be fit with the ERM commands, the syntax, the complications—endogenous covariates, sample selection, treatment assignment, and observations that are correlated within panels or groups—that ERM commands address, and the interpretation of results.

The next introduction is a Rosetta stone for anyone who has used other Stata commands to account for endogenous covariates, sample selection, nonrandom treatment assignment, or panel data. It provides a simple mapping of syntax from commands such as `ivregress`, `heckman`, `xtreg`, `ivprobit`, `heckoprobit`, `xttobit` and `etregress` to the corresponding ERM command. If you are already familiar with these other commands, this entry may be all you need to get started using the ERM commands.

Finally, we include an introduction to some of the important concepts in ERMs in the context of a worked example. Here, we discuss endogeneity, sample selection, and nonrandom treatment assignment. We fit models that account for each of these complications, and we show you how to use postestimation commands to interpret the results.

[ERM] **Intro 9**   Conceptual introduction via worked example

[ERM] **Intro 9** can be read either before or after [ERM] **Intro 1**–[ERM] **Intro 7**.

Examples

The example entries demonstrate how to fit models using eregress, eintreg, eprobit, eoprobit, xteregress, xteintreg, xteprobit, and xteoprobit.

We do not recommend selecting the examples you read based only on the type of outcome discussed in the example. The syntax of the ERM commands is interchangeable. Therefore, you can substitute eintreg, eoprobit, eprobit, or eregress for each other to fit a model that addresses the same complications. The xteintreg, xteoprobit, xteprobit, and xteregress commands address one additional complication—observations that are correlated within panels or groups. Again, the syntax is interchangeable. You can add xt to the beginning of any other ERM commands and fit random-effects models that address this additional complication. Remove the xt from the beginning of the command to fit the same model without random effects. The table below lists the command, the type of outcome variable, and the complications that are addressed in each example to help you locate examples that are of most interest to you.

Example	Command	Outcome	Complications
[ERM] **Example 1a**	eregress	continuous	continuous endogenous covariate
[ERM] **Example 1b**	eintreg	interval	continuous endogenous covariate
[ERM] **Example 1c**	eintreg	interval	continuous endogenous covariate, endogenous sample selection
[ERM] **Example 2a**	eregress	continuous	binary endogenous covariate
[ERM] **Example 2b**	eregress	continuous	exogenous treatment
[ERM] **Example 2c**	eregress	continuous	endogenous treatment
[ERM] **Example 3a**	eprobit	binary	continuous endogenous covariate
[ERM] **Example 3b**	eprobit	binary	continuous endogenous covariate, endogenous treatment
[ERM] **Example 4a**	eprobit	binary	endogenous sample selection
[ERM] **Example 4b**	eprobit	binary	endogenous sample selection, endogenous treatment
[ERM] **Example 5**	eprobit	binary	endogenous ordinal treatment
[ERM] **Example 6a**	eoprobit	ordinal	endogenous treatment
[ERM] **Example 6b**	eoprobit	ordinal	endogenous treatment, endogenous sample selection
[ERM] **Example 7**	xteregress	continuous	continuous endogenous covariate, random effects in all equations
[ERM] **Example 8a**	xteregress	continuous	continuous endogenous covariate, random effects in one equation
[ERM] **Example 8b**	xteregress	continuous	continuous endogenous covariate, endogenous sample selection, random effects in two equations
[ERM] **Example 9**	xteoprobit	ordinal	endogenous treatment, random effects in all equations

The type of outcome does play a role in the way results are interpreted, so examples with the same outcome type will be of interest for interpretation. If your main interest is in interpretation, also see [ERM] **Intro 7** and [ERM] **Intro 9**.

ERM commands

The entries for the individual commands provide details on syntax and implementation. The *Methods and formulas* sections include full details on the models that can be fit using these commands. The xteintreg, xteoprobit, xteprobit, and xteregress commands are documented in these entries as well.

[ERM] **eintreg**	Extended interval regression
[ERM] **eoprobit**	Extended ordered probit regression
[ERM] **eprobit**	Extended probit regression
[ERM] **eregress**	Extended linear regression
[ERM] **ERM options**	Extended regression model options

Postestimation

The postestimation commands allow you to estimate treatment effects, obtain predictions, perform tests, and more. They are documented in the entries listed below.

[ERM] **eintreg postestimation**	Postestimation tools for eintreg and xteintreg
[ERM] **eintreg predict**	predict after eintreg and xteintreg
[ERM] **eoprobit postestimation**	Postestimation tools for eoprobit and xteoprobit
[ERM] **eoprobit predict**	predict after eoprobit and xteoprobit
[ERM] **eprobit postestimation**	Postestimation tools for eprobit and xteprobit
[ERM] **eprobit predict**	predict after eprobit and xteprobit
[ERM] **eregress postestimation**	Postestimation tools for eregress and xteregress
[ERM] **eregress predict**	predict after eregress and xteregress
[ERM] **estat teffects**	Average treatment effects for extended regression models
[ERM] **predict advanced**	predict's advanced features
[ERM] **predict treatment**	predict for treatment statistics

Examples using postestimation commands are found in [ERM] **Intro 9** and in the example entries.

Technical details

ERM commands require that endogenous covariates form a triangular or recursive system. Here, we discuss triangular systems and possible solutions if your model does not have this required form.

[ERM] **Triangularize**   How to triangularize a system of equations

Glossary

Finally, we provide a glossary that can be referred to as needed.

[ERM] **Glossary**   Glossary of technical terms