

**eregress postestimation** — Postestimation tools for eregress and xtregress

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## Postestimation commands

The following postestimation command is of special interest after `eregress` and `xtregress`:

| Command                     | Description                                   |
|-----------------------------|---|
| <code>estat teffects</code> | treatment effects and potential-outcome means |

The following standard postestimation commands are also available after `eregress` and `xtregress`:

| Command                               | Description   |
|---------------------------------------|---|
| <code>contrast</code>                 | contrasts and ANOVA-style joint tests of estimates  |
| <code>estat ic</code>                 | Akaike's and Schwarz's Bayesian information criteria (AIC and BIC)                                  |
| <code>estat summarize</code>          | summary statistics for the estimation sample  |
| <code>estat vce</code>                | variance–covariance matrix of the estimators (VCE)  |
| <sup>†</sup> <code>estat (svy)</code> | postestimation statistics for survey data   |
| <code>estimates</code>                | cataloging estimation results   |
| * <code>forecast</code>               | dynamic forecasts and simulations   |
| * <code>hausman</code>                | Hausman's specification test  |
| <code>lincom</code>                   | point estimates, standard errors, testing, and inference for linear combinations of coefficients    |
| * <code>lrtest</code>                 | likelihood-ratio test   |
| <code>margins</code>                  | marginal means, predictive margins, marginal effects, and average marginal effects                  |
| <code>marginsplot</code>              | graph the results from margins (profile plots, interaction plots, etc.)                             |
| <code>nlcom</code>                    | point estimates, standard errors, testing, and inference for nonlinear combinations of coefficients |
| <code>predict</code>                  | means, probabilities, treatment effects, etc.   |
| <code>predictnl</code>                | point estimates, standard errors, testing, and inference for generalized predictions                |
| <code>pwcompare</code>                | pairwise comparisons of estimates   |
| <sup>†</sup> <code>suest</code>       | seemingly unrelated estimation  |
| <code>test</code>                     | Wald tests of simple and composite linear hypotheses  |
| <code>testnl</code>                   | Wald tests of nonlinear hypotheses  |

\*`forecast`, `hausman`, and `lrtest` are not appropriate with `svy` estimation results.

<sup>†</sup>`suest` and the survey data `estat` commands are not available after `xtregress`.

## predict

Predictions after `eregress` and `xtegress` are described in

|                                |                                  |
|--------------------------------|----------------------------------|
| [ERM] <b>eregress predict</b>  | predict after eregress           |
| [ERM] <b>predict treatment</b> | predict for treatment statistics |
| [ERM] <b>predict advanced</b>  | predict's advanced features      |

[ERM] **eregress predict** describes the most commonly used predictions. If you fit a model with treatment effects, predictions specifically related to these models are detailed in [ERM] **predict treatment**. [ERM] **predict advanced** describes less commonly used predictions, such as predictions of outcomes in auxiliary equations.

## margins

### Description for margins

`margins` estimates statistics based on fitted models. These statistics include marginal means, marginal probabilities, potential-outcome means, average and conditional derivatives, average and conditional effects, and treatment effects.

### Menu for margins

Statistics > Postestimation

### Syntax for margins

```
margins [marginlist] [, options]
```

```
margins [marginlist] , predict(statistic ...) [predict(statistic ...) ...] [options]
```

| <i>statistic</i> | Description |
|------------------|-------------|
|------------------|-------------|

---

|                         |   |
|-------------------------|---|
| Main                    |   |
| <u>mean</u>             | mean; the default   |
| <u>pr</u>               | probability for binary or ordinal $y_j$                             |
| <u>pomean</u>           | potential-outcome mean  |
| <u>te</u>               | treatment effect  |
| <u>tet</u>              | treatment effect on the treated                                     |
| <u>xb</u>               | linear prediction excluding all complications                       |
| <u>pr</u> ( $a, b$ )    | $\Pr(a < y_j < b)$ for continuous $y_j$                             |
| <u>e</u> ( $a, b$ )     | $E(y_j   a < y_j < b)$ for continuous $y_j$                         |
| <u>ystar</u> ( $a, b$ ) | $E(y_j^*)$ , $y_j^* = \max\{a, \min(y_j, b)\}$ for continuous $y_j$ |
| <u>expmean</u>          | calculate $E\{\exp(y_i)\}$  |

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Statistics not allowed with `margins` are functions of stochastic quantities other than `e(b)`.

For the full syntax, see [R] **margins**.

## Remarks and examples

See [ERM] [Intro 7](#) for an overview of using margins and predict after eregress. For examples using margins, predict, and estat teffects, see *Interpreting effects* in [ERM] [Intro 9](#) and see [ERM] [Example 1a](#).

## Methods and formulas

This section contains methods and formulas for predictions and inference for the default average structural function. Methods and formulas for all other predictions are given in *Methods and formulas* of [ERM] [eregress](#). We begin with the cross-sectional model and then extend our discussion to the random effect models that we use for panel data.

In the linear regression model, for exogenous covariates  $\mathbf{x}_i$  and  $C$  endogenous regressors  $\mathbf{w}_i$ , we have

$$y_i = \mathbf{x}_i\boldsymbol{\beta} + \mathbf{w}_i\boldsymbol{\beta}_2 + \epsilon_i$$

where the error  $\epsilon_i$  is normal and correlated with  $\mathbf{w}_i$ .

Because  $\epsilon_i$  is a normally distributed, mean 0, random variable, we can split it into two mean 0, normally distributed, independent parts,

$$\epsilon_i = \gamma\epsilon_{2i} + \psi_i$$

where  $\epsilon_{2i}$  is the unobserved heterogeneity that gives rise to the endogeneity and  $\psi_i$  is an idiosyncratic error term with variance  $\sigma_\psi^2$ .

Conditional on the covariates and the unobserved heterogeneity, the conditional mean of  $y_i$  is

$$E(y_i|\mathbf{x}_i, \mathbf{w}_i, \epsilon_i) = \mathbf{x}_i\boldsymbol{\beta} + \mathbf{w}_i\boldsymbol{\beta}_2 + \gamma\epsilon_{2i}$$

Predictions and effects are computed based on the expression above. Including  $\epsilon_{2i}$  controls for endogeneity. Thus, all effects computed using the expression above have a structural interpretation. See [Imbens and Newey \(2009\)](#) and [Wooldridge \(2010\)](#) for a detailed description of structural functions for models with endogeneity.

Our discussion easily extends to models for panel data with random effects. In this case, we have  $N$  panels. Panel  $i = 1, \dots, N$  has observations  $t = 1, \dots, N_i$ , so we observe  $y_{it}$  with random effect  $\alpha_i$  and observation-level error  $\epsilon_{it}$ . These errors are independent of each other. So the combined error  $\xi_{it} = \alpha_i + \epsilon_{it}$  is normal with mean 0 and variance  $\sigma^2 + \sigma_\alpha^2$ , where  $\sigma_\alpha^2$  is the variance of  $\alpha_i$ . The results discussed earlier can then be applied using the combined error  $\xi_{it}$  rather than the cross-sectional error.

All predictions after xteregress assume the panel-level random effects ( $\alpha_i$ ) are zero. Put another way, predictions condition on the random effects being set to their means.

## References

- Imbens, G. W., and W. K. Newey. 2009. Identification and estimation of triangular simultaneous equations models without additivity. *Econometrica* 77: 1481–1512. <https://doi.org/10.3982/ECTA7108>.
- Wooldridge, J. M. 2010. *Econometric Analysis of Cross Section and Panel Data*. 2nd ed. Cambridge, MA: MIT Press.

## Also see

[ERM] [eregress](#) — Extended linear regression

[ERM] [eregress predict](#) — predict after `eregress` and `xtheregress`

[ERM] [predict treatment](#) — predict for treatment statistics

[ERM] [predict advanced](#) — predict's advanced features

[ERM] [eprobit postestimation](#) — Postestimation tools for `eprobit` and `xteprobit`

[U] [20 Estimation and postestimation commands](#)