Postestimation commands   predict   margins   estat
Remarks and examples   Stored results   Methods and formulas   Also see

Postestimation commands

The following postestimation command is of special interest after `cfprobit`:

Command	Description
estat endogenous	perform tests of endogeneity

The following postestimation commands are also available:

Command	Description
contrast	contrasts and ANOVA-style joint tests of parameters
estat summarize	summary statistics for the estimation sample
estat vce	variance–covariance matrix of the estimators (VCE)
estimates	cataloging estimation results
etable	table of estimation results
forecast	dynamic forecasts and simulations
hausman	Hausman's specification test
lincom	point estimates, standard errors, testing, and inference for linear combinations of parameters
margins	marginal means, predictive margins, marginal effects, and average marginal effects
marginsplot	graph the results from margins (profile plots, interaction plots, etc.)
nlcom	point estimates, standard errors, testing, and inference for nonlinear combinations of parameters
predict	predictions and their SEs, residuals, etc.
predictnl	point estimates, standard errors, testing, and inference for generalized predictions
pwcompare	pairwise comparisons of parameters
test	Wald tests of simple and composite linear hypotheses
testnl	Wald tests of nonlinear hypotheses

predict

Description for predict

predict creates a new variable containing predictions such as linear predictions, residuals, and standard errors.

Menu for predict

Statistics > Postestimation

Syntax for predict

predict [*type*] *newvar* [*if*] [*in*] [, *statistic*]

statistic	Description
Main	
pr	probability of a positive outcome; the default
xb	linear prediction
xbv	linear prediction that includes control functions
stdp	standard error of the prediction

These statistics are available both in and out of sample; type predict . . . if e(sample) . . . if wanted only for the estimation sample.

Options for predict

    Main

pr calculates the probability of a positive outcome. This has an average structural function interpretation and is conditional on the control functions.

xb calculates the linear prediction for the main equation that does not include control-function terms, that is, $\mathbf{x}_i\mathbf{b}$.

xbv calculates the linear prediction for the main equation that includes the estimated control-function terms with their coefficients, that is, $\mathbf{x}_i\mathbf{b} + \hat{\nu}_i\mathbf{p} + h(\hat{\nu}_i, \mathbf{y}_i, \mathbf{x}_i)'\mathbf{p}_h$.

stdp calculates the standard error of the prediction, which can be thought of as the standard error of the predicted expected value or mean for the observation's covariate pattern. This is also referred to as the standard error of the fitted value.

margins

Description for margins

margins estimates margins of response for linear predictions and probabilities.

Menu for margins

Statistics > Postestimation

Syntax for margins

margins [*marginlist*] [, *options*]

margins [*marginlist*] , <u>predict</u>(*statistic* ...) [<u>predict</u>(*statistic* ...) ...] [*options*]

statistic	Description
pr	probability of a positive outcome; the default
xb	linear prediction
xbv	linear prediction that includes control functions
stdp	not allowed with margins

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

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

estat

Description for estat

estat endogenous performs tests to determine whether endogenous regressors in the model are in fact exogenous. Tests are performed as Wald tests on the coefficients of relevant control functions and their interactions in the model and account for the type of variance–covariance matrix used.

Menu for estat

Statistics > Postestimation

Syntax for estat

estat <u>endogenous</u> [*varlist*]

collect is allowed with estat endogenous; see [U] **11.1.10 Prefix commands**.

Remarks and examples

Remarks are presented under the following headings:

Obtaining predicted values

predict's pr option calculates the probability of a positive outcome as specified by the model, conditional on the control functions. It corresponds to the result of predict after ivprobit with options pr and asf and has a similar average structural function interpretation; see [R] **ivprobit postestimation**.

estat endogenous

Control-function regression lends itself naturally to tests of endogeneity. Under the null hypothesis that an endogenous variable is in fact endogenous, the coefficient on its associated control function, as well as the coefficients on any interactions of the control function, will be zero. Accordingly, a test of these coefficients is a test of the endogeneity of the associated endogenous variable.

estat endogenous tests the endogeneity of all endogenous variables jointly if specified without a variable list. Otherwise, only the endogeneity of the listed variables is tested.

For an example of the use of estat endogenous after cfprobit, see example 2 in [R] **cfprobit**.

Stored results

estat endogenous stores the following in r():

Scalars
  r(chi2) χ^2 statistic
  r(df)   degrees of freedom
  r(p) p-value for χ^2 statistic

Methods and formulas

As discussed in [R] **cfprobit**, the equation estimated by cfprobit has the form

$$P(y_{i0} = 1|\mathbf{y}_i, \mathbf{x}_i, \mathbf{w}_i, \mathbf{z}_i) = \Phi\{\mathbf{y}_i\boldsymbol{\beta}_1 + \mathbf{x}_i\boldsymbol{\beta}_2 + \mathbf{w}_i\boldsymbol{\beta}_3 + \hat{\boldsymbol{\nu}}_i\boldsymbol{\rho} + h(\hat{\boldsymbol{\nu}}_i, \mathbf{y}_i, \mathbf{x}_i, \mathbf{z}_i, \mathbf{w}_i)'\boldsymbol{\rho}_h + \epsilon_i\}$$

where $\hat{\boldsymbol{\nu}}_i$ is a set of estimated control functions, one for each of the endogenous variables in $\mathbf{y}_i$, and $h(\cdot)$ is a known vector-valued function. $h(\cdot)$ can include, for our purposes, interactions between the control functions in $\hat{\boldsymbol{\nu}}_i$, as well as interactions between control functions and the exogenous and endogenous variables in the model.

Methods and formulas are presented under the following headings:

Obtaining predicted values

The linear prediction using the xb option is computed as $\mathbf{y}_i\widehat{\boldsymbol{\beta}}_1 + \mathbf{x}_i\widehat{\boldsymbol{\beta}}_2 + \mathbf{w}_i\widehat{\boldsymbol{\beta}}_3$. The linear prediction, including control functions using the xbv option, is computed as $\mathbf{y}_i\widehat{\boldsymbol{\beta}}_1 + \mathbf{x}_i\widehat{\boldsymbol{\beta}}_2 + \mathbf{w}_i\widehat{\boldsymbol{\beta}}_3 + \widehat{\boldsymbol{\nu}}_i\widehat{\boldsymbol{\rho}} + h(\widehat{\boldsymbol{\nu}}_i, \mathbf{y}_i, \mathbf{x}_i, \mathbf{z}_i, \mathbf{w}_i)'\widehat{\boldsymbol{\rho}_h}$. The probability of a positive outcome using option pr is computed as the cumulative standard normal distribution function evaluated at the linear prediction including control functions.

estat endogenous

estat endogenous, when specified without a variable list, conducts a joint Wald test of $\rho = 0$ and $\rho_h = 0$.

When a variable list is specified, estat endogenous conducts a Wald test for the null hypothesis that all the coefficients in ρ and ρ_h, which involve the control functions of the specified variables, are jointly equal to 0. See [R] **test** for documentation of Wald tests.

Also see

[R] **cfprobit** — Control-function probit regression

[U] **20 Estimation and postestimation commands**