cmmprobit postestimation — Postestimation tools for cmmprobit

Postestimation commands

The following postestimation commands are of special interest after `cmmprobit`:

Command	Description
`estat covariance`	covariance matrix of the utility errors for the alternatives
`estat correlation`	correlation matrix of the utility errors for the alternatives
`estat facweights`	covariance factor weights matrix

The following standard postestimation commands are also available:

Command	Description
`contrast`	contrasts and ANOVA-style joint tests of parameters
`estat ic`	Akaike's, consistent Akaike's, corrected Akaike's, and Schwarz's Bayesian information criteria (AIC, CAIC, AICc, and BIC, respectively)
`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
`hausman`	Hausman's specification test
`lincom`	point estimates, standard errors, testing, and inference for linear combinations of parameters
`lrtest`	likelihood-ratio test
`margins`	adjusted predictions, predictive margins, and 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`	probabilities, 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 probabilities, linear predictions, and standard errors.

Menu for predict

Statistics > Postestimation

Syntax for predict

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

`predict` [*type*] *stub*`*` [*if*] [*in*], `scores`

statistic	Description
Main	
`pr`	probability alternative is chosen; the default
`xb`	linear prediction
`stdp`	standard error of the linear prediction

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

`predict` omits missing values casewise if `cmmprobit` used casewise deletion (the default); if `cmmprobit` used alternativewise deletion (option `altwise`), `predict` uses alternativewise deletion.

Options for predict

Main

`pr`, the default, calculates the probability of choosing each alternative.

`xb` calculates the linear prediction.

`stdp` calculates the standard error of the linear prediction.

`scores` calculates the scores for each coefficient in `e(b)`. This option requires a new variable list of length equal to the number of columns in `e(b)`. Otherwise, use the *stub*`*` syntax to have `predict` generate enumerated variables with prefix *stub*.

margins

Description for margins

`margins` estimates margins of response for probabilities and linear predictions.

Menu for margins

Statistics > Postestimation

Syntax for margins

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

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

statistic	Description
`pr`	probability alternative is chosen; the default
`xb`	linear prediction
`stdp`	not allowed with `margins`
`scores`	not allowed with `margins`

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

For more details, see [CM] **margins**.

estat

Description for estat

`estat covariance` computes the estimated variance–covariance matrix of the utility (latent-variable) errors for the alternatives. The estimates are displayed, and the variance–covariance matrix is stored in `r(cov)`.

`estat correlation` computes the estimated correlation matrix of the utility (latent-variable) errors for the alternatives. The estimates are displayed, and the correlation matrix is stored in `r(cor)`.

`estat facweights` displays the covariance factor weights matrix and stores it in `r(C)`.

Menu for estat

Statistics > Postestimation

Syntax for estat

Covariance matrix of the utility errors for the alternatives

`estat covariance [ , format(%fmt) border(bspec) left(#) ]`

Correlation matrix of the utility errors for the alternatives

`estat correlation [ , format(%fmt) border(bspec) left(#) ]`

Covariance factor weights matrix

`estat facweights [ , format(%fmt) border(bspec) left(#) ]`

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

Options for estat covariance, estat correlation, and estat facweights

`format(%fmt)` sets the matrix display format. The default for `estat covariance` and `estat facweights` is `format(%9.0g)`; the default for `estat correlation` is `format(%9.4f)`.

`border(bspec)` sets the matrix display border style. The default is `border(all)`. See [P] **matlist**.

`left(#)` sets the matrix display left indent. The default is `left(2)`. See [P] **matlist**.

Remarks and examples

Remarks are presented under the following headings:

Predicted probabilities
Obtaining estimation statistics

Predicted probabilities

After fitting a multinomial probit choice model, you can use `predict` to obtain the simulated probabilities that an individual will choose each of the alternatives.

When evaluating the multivariate normal probabilities via Monte Carlo simulation, `predict` uses the same method to generate the random sequence of numbers as the previous call to `cmmprobit`. For example, if you specified `intmethod(Halton)` when fitting the model, `predict` also uses the Halton sequence.

In example 1 of [CM] **cmmprobit**, we fit a model of individuals' travel-mode choices. We can obtain the simulated probabilities that an individual chooses each alternative by using `predict`:

```
. use https://www.stata-press.com/data/r19/travel
(Modes of travel)
. cmset id mode
     Case ID variable: id
Alternatives variable: mode
. quietly cmmprobit choice travelcost termtime, casevars(income)
. predict prob
(option pr assumed; Pr(mode))
. list id mode prob choice in 1/12, sepby(id)
```

	id	mode	prob	choice
1.	1	Air	.1491488	0
2.	1	Train	.3291686	0
3.	1	Bus	.1319882	0
4.	1	Car	.3899048	1
5.	2	Air	.2565295	0
6.	2	Train	.2761068	0
7.	2	Bus	.0116262	0
8.	2	Car	.4557356	1
9.	3	Air	.2098824	0
10.	3	Train	.1082094	0
11.	3	Bus	.1671392	0
12.	3	Car	.5147675	1

Obtaining estimation statistics

Once you have fit a `cmmprobit` model, you can obtain the estimated variance or correlation matrices for the model alternatives by using the `estat` command.

To display the correlations of the errors in the utility equations, we type

```
. estat correlation
```

	Train	Bus	Car
Train	1.0000		
Bus	0.8909	1.0000	
Car	0.7895	0.8953	1.0000

Note: Correlations are for alternatives differenced with Air.

The covariance matrix can be displayed by typing

```
. estat covariance
```

	Train	Bus	Car
Train	2		
Bus	1.601736	1.616288	
Car	1.374374	1.401054	1.515069

Note: Covariances are for alternatives differenced with Air.

Also see

[CM] **cmmprobit** — Multinomial probit choice model

[CM] **margins** — Adjusted predictions, predictive margins, and marginal effects

[U] 20 Estimation and postestimation commands