Title

cmclogit postestimation — Postestimation tools for cmclogit

Postestimation commands   predict   margins   Remarks and examples
Also see

Postestimation commands

The following postestimation commands are available after `cmclogit`:

Command	Description
contrast	contrasts and ANOVA-style joint tests of estimates
estat ic	Akaike's, consistent Akaike's, corrected Akaike's, and Schwarz's Bayesian information criteria (AIC, CAIC, AICc, and BIC)
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 coefficients
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 coefficients
predict	probabilities, etc.
predictnl	point estimates, standard errors, testing, and inference for generalized predictions
pwcompare	pairwise comparisons of estimates
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* <u>nooff</u>set]

> predict [*type*] *stub** [*if*] [*in*], <u>sc</u>ores

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 cmclogit used casewise deletion (the default); if cmclogit 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.

nooffset is relevant only if you specified offset(*varname*) for cmclogit. It modifies the calculations made by predict so that they ignore the offset variable; the linear prediction is treated as $x\beta$ rather than as $x\beta + $ offset.

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**.

Remarks and examples

Remarks are presented under the following headings:

    Testing coefficient estimates
    Predicted probabilities
        Casewise versus alternativewise sample selection
    Obtaining estimation statistics for the alternatives

Testing coefficient estimates

The output of cmclogit is displayed and stored as a multiple-equation model. Let's illustrate this with example 1 of [CM] **cmclogit**.

▷ Example 1

We load the data, cmset the data, and run cmclogit.

```
. use https://www.stata-press.com/data/r18/carchoice
(Car choice data)
. cmset consumerid car
note: alternatives are unbalanced across choice sets; choice sets of different
      sizes found.
      Case ID variable: consumerid
Alternatives variable: car
. cmclogit purchase dealers, casevars(i.gender income)
  (output omitted)
```

The coefficient estimates for `i.gender` and `income` are stored under the equation names `Japanese`, `European`, and `Korean`, that is, the names of the alternatives, except for the base alternative `American`. To test whether the coefficient estimates for `i.gender` are the same for the Japanese and Korean alternatives relative to the American base alternative, we type

```
. test [Japanese]:1.gender = [Korean]:1.gender

 ( 1)  [Japanese]1.gender - [Korean]1.gender = 0

          chi2(  1) =    1.00
        Prob > chi2 =    0.3169
```

The following shorthand syntax is useful for testing across the alternatives:

```
. test [Japanese = European = Korean]:1.gender

 ( 1)  [Japanese]1.gender - [European]1.gender = 0
 ( 2)  [Japanese]1.gender - [Korean]1.gender = 0

          chi2(  2) =   15.62
        Prob > chi2 =    0.0004
```

See [R] **test** for details.

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Predicted probabilities

After running `cmclogit`, you can use `predict` to obtain the estimated probability that each alternative is chosen for each case conditional on its observed data.

▷ Example 2

Continuing with the previous example, we calculate predicted probabilities and list them for the first four cases:

```
. predict p
(option pr assumed; Pr(car))

. format p %6.3f

. list consumerid car purchase gender income p
> if consumerid <= 4, sepby(consumerid) abbr(10)
```

	consumerid	car	purchase	gender	income	p
1.	1	American	1	Male	46.7	0.391
2.	1	Japanese	0	Male	46.7	0.374
3.	1	European	0	Male	46.7	0.183
4.	1	Korean	0	Male	46.7	0.053
5.	2	American	1	Male	26.1	0.493
6.	2	Japanese	0	Male	26.1	0.274
7.	2	European	0	Male	26.1	0.095
8.	2	Korean	0	Male	26.1	0.138
9.	3	American	0	Male	32.7	0.524
10.	3	Japanese	1	Male	32.7	0.337
11.	3	European	0	Male	32.7	0.138
12.	4	American	1	Female	49.2	0.391
13.	4	Japanese	0	Female	49.2	0.496
14.	4	European	0	Female	49.2	0.113

To get predicted probabilities and marginal effects averaged across the sample or for hypothetical cases (that is, predictor values set to particular values), use the margins postestimation command; see [CM] **Intro 1** and [CM] **margins** for more information and examples.

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Casewise versus alternativewise sample selection

Missing values in CM data are handled in two possible ways: casewise deletion (the default) and alternativewise (altwise) deletion. Casewise deletion omits the whole case whenever any observation within the case has a missing value. Alternativewise deletion omits only the observations with missing values.

predict uses whatever was used with cmclogit. If cmclogit used casewise deletion, predict uses casewise deletion. If cmclogit was used with the option altwise, predict uses alternativewise deletion. Should you wish to select the sample for predict yourself, you can use an if restriction with predict.

See example 3 in [CM] **cmclogit** for more on casewise versus alternativewise deletion.

Obtaining estimation statistics for the alternatives

▷ Example 3

cmtab can be used to obtain a table of the alternatives for the estimation sample. If there are missing values in the data used to fit the model, you will need to restrict cmtab to the estimation sample by specifying if e(sample).

```
. cmtab if e(sample), choice(purchase)
Tabulation of chosen alternatives (purchase = 1)
```

Nationality of car	Freq.	Percent	Cum.
American	376	43.62	43.62
Japanese	316	36.66	80.28
European	130	15.08	95.36
Korean	40	4.64	100.00
Total	862	100.00	

cmchoiceset is useful for obtaining a table of the choice-set patterns.

```
. cmchoiceset if e(sample)
Tabulation of choice-set possibilities
```

Choice set	Freq.	Percent	Cum.
1 2 3	373	43.27	43.27
1 2 3 4	489	56.73	100.00
Total	862	100.00	

Note: Total is number of cases.

If you have missing data or see notes mentioning cases being dropped, cmsample can identify omitted observations and show the reason they were omitted from the estimation sample. See [CM] **cmsample**.

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Also see

[CM] **cmclogit** — Conditional logit (McFadden's) choice model

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

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