

cmclogit postestimation — Postestimation tools for `cmclogit`

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Postestimation commands

The following postestimation commands are available after `cmclogit`:

Command	Description
<code>contrast</code>	contrasts and ANOVA-style joint tests of estimates
<code>estat ic</code>	Akaike's, consistent Akaike's, corrected Akaike's, and Schwarz's Bayesian information criteria (AIC, CAIC, AICc, and BIC)
<code>estat summarize</code>	summary statistics for the estimation sample
<code>estat vce</code>	variance–covariance matrix of the estimators (VCE)
<code>estimates</code>	cataloging estimation results
<code>etable</code>	table of estimation results
<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>	adjusted predictions, predictive margins, and 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>	probabilities, etc.
<code>predictnl</code>	point estimates, standard errors, testing, and inference for generalized predictions
<code>pwcompare</code>	pairwise comparisons of estimates
<code>test</code>	Wald tests of simple and composite linear hypotheses
<code>testnl</code>	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 nooffset]
```

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

<i>statistic</i>	Description
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Main

<code>pr</code>	probability alternative is chosen; the default
<code>xb</code>	linear prediction
<code>stdp</code>	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 `cmlogit` used casewise deletion (the default); if `cmlogit` 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 `cmlogit`. It modifies the calculations made by `predict` so that they ignore the offset variable; the linear prediction is treated as $\mathbf{x}\beta$ rather than as $\mathbf{x}\beta + \text{offset}$.

`scores` calculates the scores for each coefficient in $\mathbf{e}(b)$. This option requires a new variable list of length equal to the number of columns in $\mathbf{e}(b)$. 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]
```

<i>statistic</i>	Description
<code>pr</code>	probability alternative is chosen; the default
<code>xb</code>	linear prediction
<code>stdp</code>	not allowed with <code>margins</code>
<code>scores</code>	not allowed with <code>margins</code>

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

For more details, see [CM] [margins](#).

Remarks and examples

[stata.com](http://www.stata.com)

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.

◀

Predicted probabilities

After running `cmclgfit`, 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.



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 `cmlogit`. If `cmlogit` used casewise deletion, `predict` uses casewise deletion. If `cmlogit` 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] [cmlogit](#) 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](#).



Also see

[CM] [cmlogit](#) — Conditional logit (McFadden's) choice model

[CM] [margins](#) — Adjusted predictions, predictive margins, and marginal effects

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