## 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 parameters
estat ic	Akaike's, consistent Akaike's, corrected Akaike's, and Schwarz's Bayesian infor- mation 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 nooffset]
```

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 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  $\mathbf{x}\beta$  rather than as  $\mathbf{x}\beta$  + 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

<pre>margins [marginlist] [, options]</pre>			
<pre>margins [marginlist], predict(statistic) [predict(statistic)] [options]</pre>			
statistic	Description		
pr	probability alternative is chosen; the default		
xb	linear prediction		
stdp	not allowed with margins		
<u>sc</u> ores	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/r19/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

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

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)</pre>

	consumerid	car	purchase	gender	income	р
1.	1	American	1	Male	46.7	0.391
2.	1	Japanese	0	Male	46.7	0.374
з.	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), cho	ice(purchase	e)
Tabulation of	f chosen alte	rnatives ( <b>p</b>	urchase = 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	e)	
Tabulation of	choice-set	possibilities	
Choice set	Freq.	Percent	Cum.
123	373	43.27	43.27
1234	489	56.73	100.00
Total	862	100.00	
Note: Total i	s 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] cmclogit Conditional logit (McFadden's) choice model
- [CM] margins Adjusted predictions, predictive margins, and marginal effects
- [U] 20 Estimation and postestimation commands

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