Title

> **nlogit postestimation** — Postestimation tools for nlogit

Postestimation commands

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

Command	Description
estat alternatives	alternative summary statistics

The following standard postestimation commands are also available:

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
nlcom	point estimates, standard errors, testing, and inference for nonlinear combinations of coefficients
predict	probabilities, linear predictions, inclusive values, 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, conditional probabilities, and inclusive values.

Menu for predict

Statistics > Postestimation

Syntax for predict

> predict [*type*] *newvar* [*if*] [*in*] [, *statistic* hlevel(*#*)]

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

statistic	Description
Main	
pr	predicted probabilities of choosing the alternatives at all levels of the hierarchy or at level *#*, where *#* is specified by hlevel(*#*); the default
xb	linear predictors for all levels of the hierarchy or at level *#*, where *#* is specified by hlevel(*#*)
condp	predicted conditional probabilities at all levels of the hierarchy or at level *#*, where *#* is specified by hlevel(*#*)
iv	inclusive values for levels 2, . . . , e(levels) or for hlevel(*#*)

The inclusive value for the first-level alternatives is not used in estimation; therefore, it is not calculated.

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 nlogit used casewise deletion (the default); if nlogit used alternativewise deletion (option altwise), predict uses alternativewise deletion.

Options for predict

       Main

pr calculates the probability of choosing each alternative at each level of the hierarchy. Use the hlevel(*#*) option to compute the alternative probabilities at level *#*. When hlevel(*#*) is not specified, *j* new variables must be given, where *j* is the number of levels, or use *stub** to have predict generate *j* variables with the prefix *stub* and numbered from 1 to *j*. The pr option is the default, and if one new variable is given, the probability of the bottom-level alternatives are computed. Otherwise, probabilities for all levels are computed, and *stub** is still valid.

xb calculates the linear prediction for each alternative at each level. Use the hlevel(*#*) option to compute the linear predictor at level *#*. When hlevel(*#*) is not specified, *j* new variables must be given, where *j* is the number of levels, or use *stub** to have predict generate *j* variables with the prefix *stub* and numbered from 1 to *j*.

condp calculates the conditional probabilities for each alternative at each level. Use the hlevel(#) option to compute the conditional probabilities of the alternatives at level #. When hlevel(#) is not specified, j new variables must be given, where j is the number of levels, or use *stub** to have predict generate j variables with the prefix *stub* and numbered from 1 to j.

iv calculates the inclusive value for each alternative at each level. Use the hlevel(#) option to compute the inclusive value at level #. There is no inclusive value at level 1. If hlevel(#) is not used, $j - 1$ new variables are required, where j is the number of levels, or use *stub** to have predict generate $j - 1$ variables with the prefix *stub* and numbered from 2 to j. See *Methods and formulas* in [CM] **nlogit** for a definition of the inclusive values.

hlevel(#) calculates the prediction only for hierarchy level #.

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 *stub** to have predict generate enumerated variables with prefix *stub*.

estat

Description for estat

estat alternatives displays summary statistics about the alternatives in the estimation sample for each level of the tree structure.

Menu for estat

Statistics > Postestimation

Syntax for estat

    estat alternatives

Remarks and examples

predict may be used after nlogit to obtain the predicted values of the probabilities, the conditional probabilities, the linear predictions, and the inclusive values for each level of the nested logit model. Predicted probabilities for nlogit must be interpreted carefully. Probabilities are estimated for each case as a whole and not for individual observations.

▷ Example 1

Continuing with our model in example 3 of [CM] **nlogit**, we refit the model and then examine a summary of the alternatives and their frequencies in the estimation sample.

```
. use https://www.stata-press.com/data/r18/restaurant
. nlogitgen type = restaurant(fast: Freebirds | MamasPizza,
> family: CafeEccell | LosNortenos | WingsNmore, fancy: Christophers | MadCows)
  (output omitted )
. nlogit chosen cost rating distance || type: income kids, base(family) ||
> restaurant:, noconst case(family_id)
  (output omitted )
```

```
. estat alternatives
```

Alternatives summary for type

| Alternative | | | Cases | Frequency | Percent |
index	value	label	present	selected	selected
1	1	fast	600	27	9.00
2	2	family	900	222	74.00
3	3	fancy	600	51	17.00

Alternatives summary for restaurant

| Alternative | | | Cases | Frequency | Percent |
index	value	label	present	selected	selected
1	1	Freebirds	300	12	4.00
2	2	MamasPizza	300	15	5.00
3	3	CafeEccell	300	78	26.00
4	4	LosNortenos	300	75	25.00
5	5	WingsNmore	300	69	23.00
6	6	Christophers	300	27	9.00
7	7	MadCows	300	24	8.00

Next, we predict p2 = Pr(**restaurant**); p1 = Pr(**type**); condp = Pr(**restaurant** | **type**); xb2, the linear prediction for the bottom-level alternatives; xb1, the linear prediction for the first-level alternatives; and iv, the inclusive values for the bottom-level alternatives.

```
. predict p*
(option pr assumed)
. predict condp, condp hlevel(2)
. sort family_id type restaurant
. list restaurant type chosen p2 p1 condp in 1/14, sepby(family_id) divider
```

	restaurant	type	chosen	p2	p1	condp
1.	Freebirds	fast	1	.0642332	.1189609	.5399519
2.	MamasPizza	fast	0	.0547278	.1189609	.4600481
3.	CafeEccell	family	0	.284409	.7738761	.3675124
4.	LosNortenos	family	0	.3045242	.7738761	.3935051
5.	WingsNmore	family	0	.1849429	.7738761	.2389825
6.	Christophers	fancy	0	.0429508	.107163	.4007991
7.	MadCows	fancy	0	.0642122	.107163	.5992009
8.	Freebirds	fast	0	.0183578	.0488948	.3754559
9.	MamasPizza	fast	0	.030537	.0488948	.6245441
10.	CafeEccell	family	0	.2832149	.756065	.3745907
11.	LosNortenos	family	1	.3038883	.756065	.4019341
12.	WingsNmore	family	0	.1689618	.756065	.2234752
13.	Christophers	fancy	0	.1041277	.1950402	.533878
14.	MadCows	fancy	0	.0909125	.1950402	.466122

```
. predict xb*, xb
. predict iv, iv
```

```
. list restaurant type chosen xb* iv in 1/14, sepby(family_id) divider
```

	restaurant	type	chosen	xb1	xb2	iv
1.	Freebirds	fast	1	-1.124805	-1.476914	-.2459659
2.	MamasPizza	fast	0	-1.124805	-1.751229	-.2459659
3.	CafeEccell	family	0	0	-2.181112	.1303341
4.	LosNortenos	family	0	0	-2.00992	.1303341
5.	WingsNmore	family	0	0	-3.259229	.1303341
6.	Christophers	fancy	0	1.405185	-6.804211	-.745332
7.	MadCows	fancy	0	1.405185	-5.155514	-.745332
8.	Freebirds	fast	0	-1.804794	-2.552233	-.5104123
9.	MamasPizza	fast	0	-1.804794	-1.680583	-.5104123
10.	CafeEccell	family	0	0	-2.400434	.0237072
11.	LosNortenos	family	1	0	-2.223939	.0237072
12.	WingsNmore	family	0	0	-3.694409	.0237072
13.	Christophers	fancy	0	1.490775	-5.35932	-.6796131
14.	MadCows	fancy	0	1.490775	-5.915751	-.6796131

◁

Also see

[CM] **nlogit** — Nested logit regression

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