fmm postestimation — Postestimation tools for fmm

Postestimation commands

The following postestimation commands are of special interest after estimation with `fmm`:

Command	Description
`estat eform`	display exponentiated parameters
`estat lcmean`	latent class marginal means
`estat lcprob`	latent class marginal probabilities

The following standard postestimation commands are also available:

Command	Description
contrast	contrasts and linear hypothesis tests
`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)
`estat (svy)`	postestimation statistics for survey data
`estimates`	cataloging estimation results
`etable`	table of estimation results
* `hausman`	Hausman's specification test
lincom	linear combination of parameters
* `lrtest`	likelihood-ratio test
`margins`	marginal means, predictive margins, marginal effects, and average 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	predictions, residuals, influence statistics, and other diagnostic measures
`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

* `hausman` and `lrtest` are not appropriate with `svy` estimation results.

Postestimation commands such `lincom` and `nlcom` require referencing estimated parameter values, which are accessible via `_b[`*name*`]`. To find out what the names are, type `fmm, coeflegend`.

predict

Description for predict

`predict` after `fmm` creates new variables containing predictions such as means, probabilities, linear predictions, densities, or latent class probabilities.

Menu for predict

Statistics > Postestimation

Syntax for predict

`predict` [*type*] { *stub*`*` | *newvarlist* } [*if*] [*in*] [`,` *statistic options*]

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

statistic	Description
Main	
`mu`	expected value of *depvar*; the default
`eta`	linear prediction of *depvar*
`density`	density function at *depvar*
`distribution`	distribution function at *depvar*
`survival`	survivor function at *depvar*
`classpr`	latent class probability
`classposteriorpr`	posterior latent class probability

options	Description
Main	
`marginal`	compute *statistic* marginally with respect to the latent classes
`pmarginal`	compute `mu` marginally with respect to the posterior latent class probabilities
`nooffset`	make calculation ignoring offset or exposure
* `outcome(`*depvar* [#]`)`	specify observed response variable (default all)
`class(#)`	specify latent class (default all)

*`outcome(`*depvar* #`)` is allowed only if *depvar* is from `mlogit`, `ologit`, or `oprobit`.
`outcome(`*depvar* #`)` may also be specified as `outcome(#.`*depvar*`)` or `outcome(`*depvar* `##)`.
`outcome(`*depvar* `#3)` means the third outcome value. `outcome(`*depvar* `#3)` would mean the same as `outcome(`*depvar* `4)` if outcomes were 1, 3, and 4.

Options for predict

Main

`mu`, the default, calculates the expected value of the outcomes.

`eta` calculates the fitted linear prediction.

density calculates the density function. This prediction is computed using the current values of the observed variables, including the dependent variable.

distribution calculates the distribution function. This prediction is computed using the current values of the observed variables, including the dependent variable. This option is not allowed for mlogit outcomes.

survival calculates the survivor function. This prediction is computed using the current values of the observed variables, including the dependent variable. This option is allowed only for streg outcomes.

classpr calculates predicted probabilities for each latent class.

classposteriorpr calculates predicted posterior probabilities for each latent class. The posterior probabilities are a function of the latent-class predictors and the fitted outcome densities.

marginal specifies that the prediction be computed marginally with respect to the latent classes. The marginal prediction is computed by combining the class specific predictions using the latent-class probabilities.

This option is allowed only with mu and density.

pmarginal specifies that the prediction is computed by combining the class specific expected values using the posterior latent-class probabilities.

This option is allowed only with mu.

nooffset is relevant only if option offset() or exposure() was specified at estimation time. nooffset specifies that offset() or exposure() be ignored, which produces predictions as if all subjects had equal exposure.

outcome(*depvar* [#]) specifies the *depvar* for which predictions should be calculated. Predictions for all observed response variables are computed by default. Most models have only one *depvar*. If *depvar* is an mlogit, ologit, or oprobit outcome, then # optionally specifies which outcome level to predict. The default is the first level.

class(#) specifies that predictions for latent class # be calculated. Predictions for all latent classes are computed by default.

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*.

margins

Description for margins

`margins` estimates margins of response for outcome means, outcome probabilities, and latent-class probabilities.

Menu for margins

Statistics > Postestimation

Syntax for margins

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

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

statistic	Description
default	calculate expected values for each *depvar*
`mu`	calculate expected value of *depvar*
`eta`	calculate expected value of linear prediction of *depvar*
`classpr`	calculate latent class prior probabilities
`density`	not allowed with `margins`
`distribution`	not allowed with `margins`
`survival`	not allowed with `margins`
`classposteriorpr`	not allowed with `margins`
`scores`	not allowed with `margins`

`mu` defaults to the first *depvar* if option `outcome()` is not specified. If *depvar* is `mlogit`, `ologit`, or `oprobit`, the default is the first level of the outcome. The default is the first latent class if `class()` is not specified.

`eta` defaults to the first *depvar* if option `outcome()` is not specified. If *depvar* is `mlogit`, the default is the first level of the outcome.

`classpr` defaults to the first latent class if option `class()` is not specified.

`predict`'s option `marginal` is assumed if `predict`'s option `class()` is not specified.

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

For the full syntax, see [R] **margins**.
stata.com

Remarks and examples

For examples using `estimates stats` to compare models based on Akaike information criterion and Bayesian information criterion, see **[FMM] Example 1a**, **[FMM] Example 1b**, and **[FMM] Example 1d**.

For examples using `estat lcprob` to obtain marginal latent class probabilities and `estat lcmean` to obtain marginal predicted means, see **[FMM] Example 2** and **[FMM] Example 3**.

For examples using `test` and `contrast` to test equality of coefficients across classes, see **[FMM] Example 1c**.

For examples using `predict`, see **[FMM] Example 2**, **[FMM] Example 3**, and **[FMM] Example 4**.

Methods and formulas

See *Methods and formulas* in [FMM] **fmm**.

Also see

[FMM] **fmm** — Finite mixture models using the fmm prefix

[FMM] **fmm estimation** — Fitting finite mixture models

[FMM] **fmm intro** — Introduction to finite mixture models