Postestimation commands

The following postestimation commands are available after `reg3`:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>contrast</code></td>
<td>contrasts and ANOVA-style joint tests of estimates</td>
</tr>
<tr>
<td><code>estat ic</code></td>
<td>Akaike’s and Schwarz’s Bayesian information criteria (AIC and BIC)</td>
</tr>
<tr>
<td><code>estat summarize</code></td>
<td>summary statistics for the estimation sample</td>
</tr>
<tr>
<td><code>estat vce</code></td>
<td>variance–covariance matrix of the estimators (VCE)</td>
</tr>
<tr>
<td><code>estimates</code></td>
<td>cataloging estimation results</td>
</tr>
<tr>
<td><code>forecast</code></td>
<td>dynamic forecasts and simulations</td>
</tr>
<tr>
<td><code>hausman</code></td>
<td>Hausman’s specification test</td>
</tr>
<tr>
<td><code>lincom</code></td>
<td>point estimates, standard errors, testing, and inference for linear combinations of coefficients</td>
</tr>
<tr>
<td><code>margins</code></td>
<td>marginal means, predictive margins, marginal effects, and average marginal effects</td>
</tr>
<tr>
<td><code>marginsplot</code></td>
<td>graph the results from margins (profile plots, interaction plots, etc.)</td>
</tr>
<tr>
<td><code>nlcom</code></td>
<td>point estimates, standard errors, testing, and inference for nonlinear combinations of coefficients</td>
</tr>
<tr>
<td><code>predict</code></td>
<td>predictions, residuals, influence statistics, and other diagnostic measures</td>
</tr>
<tr>
<td><code>predictnl</code></td>
<td>point estimates, standard errors, testing, and inference for generalized predictions</td>
</tr>
<tr>
<td><code>pwcompare</code></td>
<td>pairwise comparisons of estimates</td>
</tr>
<tr>
<td><code>test</code></td>
<td>Wald tests of simple and composite linear hypotheses</td>
</tr>
<tr>
<td><code>testnl</code></td>
<td>Wald tests of nonlinear hypotheses</td>
</tr>
</tbody>
</table>

*`estat ic` is not appropriate after `reg3, 2sls`.  

predict

Description for predict

predict creates a new variable containing predictions such as linear predictions, standard errors, residuals, and differences between the linear predictions of two equations.

Menu for predict

Statistics > Postestimation

Syntax for predict

```
predict [type] newvar [if] [in] [ , equation(eqno[ ,eqno ] ) statistic ]
```

<table>
<thead>
<tr>
<th>statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>xb</td>
<td>linear prediction; the default</td>
</tr>
<tr>
<td>stdp</td>
<td>standard error of the linear prediction</td>
</tr>
<tr>
<td>residuals</td>
<td>residuals</td>
</tr>
<tr>
<td>difference</td>
<td>difference between the linear predictions of two equations</td>
</tr>
<tr>
<td>stddp</td>
<td>standard error of the difference in linear predictions</td>
</tr>
</tbody>
</table>

These statistics are available both in and out of sample; type `predict ... if e(sample) ... if wanted` only for the estimation sample.

Options for predict

`equation(eqno[ ,eqno ] )` specifies to which equation you are referring.

equation() is filled in with one `eqno` for the `xb`, `stdp`, and `residuals` options. `equation(#1)` would mean the calculation is to be made for the first equation, `equation(#2)` would mean the second, and so on. You could also refer to the equations by their names. `equation(income)` would refer to the equation named income and `equation(hours)` to the equation named hours.

If you do not specify `equation()`, results are the same as if you specified `equation(#1)`.

difference and stddp refer to between-equation concepts. To use these options, you must specify two equations, for example, `equation(#1,#2) or equation(income,hours)`. When two equations must be specified, `equation()` is required.

`xb`, the default, calculates the linear prediction (fitted values)—the prediction of $x_j b$ for the specified equation.

`stdp` calculates the standard error of the prediction for the specified equation. It can be thought of as the standard error of the predicted expected value or mean for the observation’s covariate pattern. The standard error of the prediction is also referred to as the standard error of the fitted value.

`residuals` calculates the residuals.
difference calculates the difference between the linear predictions of two equations in the system. With equation(#1,#2), difference computes the prediction of equation(#1) minus the prediction of equation(#2).

stddp is allowed only after you have previously fit a multiple-equation model. The standard error of the difference in linear predictions \((x_{1j}b - x_{2j}b)\) between equations 1 and 2 is calculated.

For more information on using predict after multiple-equation estimation commands, see [R] predict.

margins

Description for margins

margins estimates margins of response for linear predictions and differences between the linear predictions of two equations.

Menu for margins

Statistics > Postestimation

Syntax for margins

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

<table>
<thead>
<tr>
<th>statistic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>default</td>
<td>linear predictions for each equation</td>
</tr>
<tr>
<td>xb</td>
<td>linear prediction for a specified equation</td>
</tr>
<tr>
<td>difference</td>
<td>difference between the linear predictions of two equations</td>
</tr>
<tr>
<td>stdp</td>
<td>not allowed with margins</td>
</tr>
<tr>
<td>residuals</td>
<td>not allowed with margins</td>
</tr>
<tr>
<td>stddp</td>
<td>not allowed with margins</td>
</tr>
</tbody>
</table>

xb defaults to the first equation.

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

For the full syntax, see [R] margins.

Remarks and examples

Example 1: Using predict

In example 2 of [R] reg3, we fit a simple supply-and-demand model. Here we obtain the fitted supply and demand curves assuming that the exogenous regressors equal their sample means. We first replace each of the three exogenous regressors with their sample means, then we call predict to obtain the predictions.
. use https://www.stata-press.com/data/r16/supDem
. global demand "(qDemand: quantity price pcompete income)"
. global supply "(qSupply: quantity price praw)"
. reg3 $demand $supply, endog(price)
. summarize pcompete, meanonly
. replace pcompete = r(mean)
. summarize income, meanonly
. replace income = r(mean)
. summarize praw, meanonly
. replace praw = r(mean)
. predict demand, equation(qDemand)
. predict supply, equation(qSupply)
. graph twoway line demand price, sort || line supply price, ytitle(" ")
> legend(label(1 "Fitted values: qDemand") label(2 "Fitted values: qSupply"))

As we would expect based on economic theory, the demand curve slopes downward while the supply curve slopes upward. With the exogenous variables at their mean levels, the equilibrium price and quantity are slightly less than 33 and 13, respectively.

Example 2: Obtaining forecasts

In example 3 of [R] reg3, we fit Klein’s (1950) model of the U.S. economy. That model includes three stochastic equations we fit using reg3 as well as four identities. Here we briefly illustrate how the forecast command can be used to obtain forecasts for all the endogenous variables in the model. For a more detailed discussion of how to forecast with this model, see [TS] forecast.
In Stata, we type

```
. use https://www.stata-press.com/data/r16/klein2, clear
. reg3 (c p L.p w) (i p L.p L.k) (wp y L.y yr), endog(w p y) exog(t wg g)
   (output omitted)
. estimates store kleineqs
. forecast create kleinmodel
   Forecast model kleinmodel started.
. forecast estimates kleineqs
   Added estimation results from `reg3'.
   Forecast model kleinmodel now contains 3 endogenous variables.
. forecast identity y = c + i + g
   Forecast model kleinmodel now contains 4 endogenous variables.
. forecast identity p = y - t - wp
   Forecast model kleinmodel now contains 5 endogenous variables.
. forecast identity k = L.k + i
   Forecast model kleinmodel now contains 6 endogenous variables.
. forecast identity w = wg + wp
   Forecast model kleinmodel now contains 7 endogenous variables.
. forecast solve, begin(1937)
```

Computing dynamic forecasts for model kleinmodel.

Starting period: 1937
Ending period: 1941
Forecast prefix: f_

```
1937: ...........................................
1938: ...........................................
1939: ...........................................
1940: ........................................
1941: ............................................
```

Forecast 7 variables spanning 5 periods.

Here we have obtained dynamic forecasts for our 7 endogenous variables beginning in 1937. By default, the variables containing the forecasts begin with the prefix f_. Next we plot the forecast and actual values of consumption:

```
. tsline c f_c
```

![Chart showing consumption over the years with forecasted values]
For more information about producing forecasts, see [TS] forecast.

**Methods and formulas**

The computational formulas for the statistics produced by `predict` can be found in [R] `predict` and [R] `regress postestimation`.

**Reference**


**Also see**

[R] `reg3` — Three-stage estimation for systems of simultaneous equations

[U] 20 Estimation and postestimation commands