mgarch ccc postestimation — Postestimation tools for mgarch ccc

Description

The following standard postestimation commands are available after mgarch ccc:

Command	Description
contrast	contrasts and ANOVA-style joint tests of estimates
estat ic	Akaike's and Schwarz's Bayesian information criteria (AIC and BIC)
estat summarize	summary statistics for the estimation sample
estat vce	variance–covariance matrix of the estimators (VCE)
estimates	cataloging estimation results
forecast	dynamic forecasts and simulations
lincom	point estimates, standard errors, testing, and inference for linear combinations of coefficients
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 coefficients
predict	predictions, residuals, influence statistics, and other diagnostic measures
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

Syntax for predict

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

statistic	Description
Main	
xb	linear prediction; the default
residuals	residuals
variance	conditional variances and covariances
correlation	conditional correlations

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

options	Description
Options	
equation(*eqnames*)	names of equations for which predictions are made
dynamic(*time_constant*)	begin dynamic forecast at specified time

Menu for predict

Statistics > Postestimation > Predictions, residuals, etc.

Options for predict

> **Main**

xb, the default, calculates the linear predictions of the dependent variables.

residuals calculates the residuals.

variance predicts the conditional variances and conditional covariances.

correlation predicts the conditional correlations.

> **Options**

equation(*eqnames*) specifies the equation for which the predictions are calculated. Use this option
to predict a statistic for a particular equation. Equation names, such as equation(income), are
used to identify equations.

One equation name may be specified when predicting the dependent variable, the residuals, or
the conditional variance. For example, specifying equation(income) causes predict to predict
income, and specifying variance equation(income) causes predict to predict the conditional
variance of income.

Two equations may be specified when predicting a conditional variance or covariance. For ex-
ample, specifying equation(income, consumption) variance causes predict to predict the
conditional covariance of income and consumption.

dynamic(*time_constant*) specifies when `predict` starts producing dynamic forecasts. The specified *time_constant* must be in the scale of the time variable specified in `tsset`, and the *time_constant* must be inside a sample for which observations on the dependent variables are available. For example, `dynamic(tq(2008q4))` causes dynamic predictions to begin in the fourth quarter of 2008, assuming that your time variable is quarterly; see [D] **datetime**. If the model contains exogenous variables, they must be present for the whole predicted sample. `dynamic()` may not be specified with `residuals`.

Remarks and examples

We assume that you have already read [TS] **mgarch ccc**. In this entry, we use `predict` after `mgarch ccc` to make in-sample and out-of-sample forecasts.

▷ Example 1: Dynamic forecasts

In this example, we obtain dynamic forecasts for the Toyota, Nissan, and Honda stock returns modeled in example 2 of [TS] **mgarch ccc**. In the output below, we reestimate the parameters of the model, use `tsappend` (see [TS] **tsappend**) to extend the data, and use `predict` to obtain in-sample one-step-ahead forecasts and dynamic forecasts of the conditional variances of the returns. We graph the forecasts below.

```
. use http://www.stata-press.com/data/r13/stocks
(Data from Yahoo! Finance)
. quietly mgarch ccc (toyota nissan = , noconstant)
> (honda = L.nissan, noconstant), arch(1) garch(1)
. tsappend, add(50)
. predict H*, variance dynamic(2016)
```
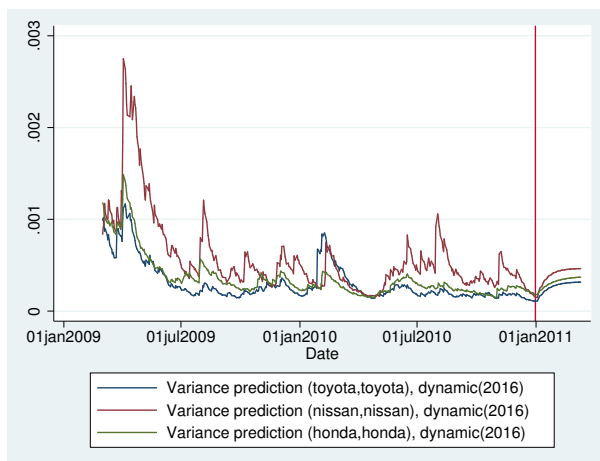

Recent in-sample one-step-ahead forecasts are plotted to the left of the vertical line in the above graph, and the dynamic out-of-sample forecasts appear to the right of the vertical line. The graph shows the tail end of the huge increase in return volatility that took place in 2008 and 2009. It also shows that the dynamic forecasts quickly converge.

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Methods and formulas

All one-step predictions are obtained by substituting the parameter estimates into the model. The estimated unconditional variance matrix of the disturbances, $\widehat{\Sigma}$, is the initial value for the ARCH and GARCH terms. The postestimation routines recompute $\widehat{\Sigma}$ using the prediction sample, the parameter estimates stored in e(b), and (3) in *Methods and formulas* of [TS] **mgarch ccc**.

For observations in which the residuals are missing, the estimated unconditional variance matrix of the disturbances is used in place of the outer product of the residuals.

Dynamic predictions of the dependent variables use previously predicted values beginning in the period specified by dynamic().

Dynamic variance predictions are implemented by substituting $\widehat{\Sigma}$ for the outer product of the residuals beginning in the period specified in dynamic().

Also see

[TS] **mgarch ccc** — Constant conditional correlation multivariate GARCH models

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