Package Name: DCCGARCH11
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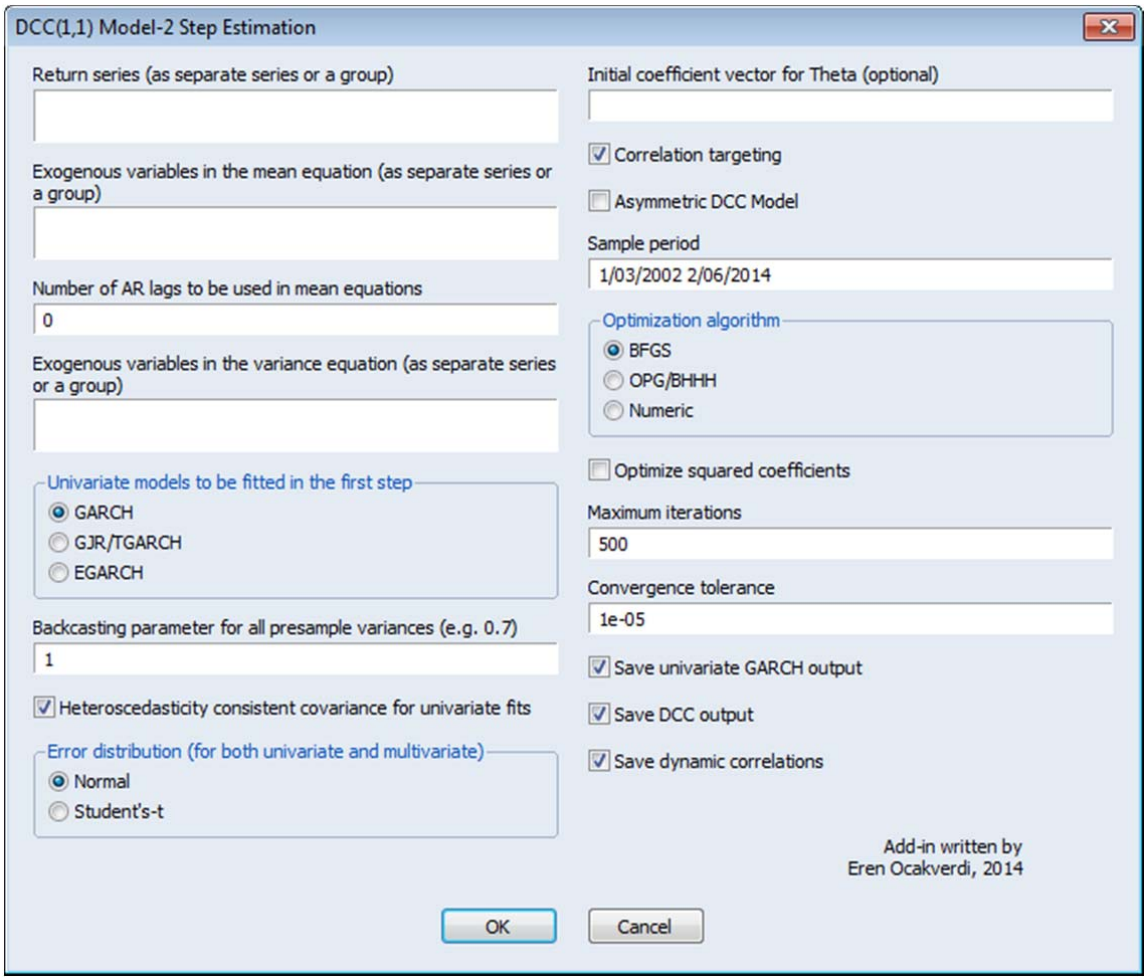
Add-in Type: Group and Global
Default Proc Name: dccgarch11
Default Menu Text: Dynamic Conditional Correlation-2 Step
Interface: Dialog and Command Line

Description: This add-in estimates a DCC GARCH (1,1) model with 2-step procedure. It is written solely for educational purposes. Detailed information on this type of modeling can be found in Engle (2002) and Cappiello et. al. (2006).

Dialog: Upon running the add-in from the menus or command line, a dialog will appear:



In the first box, you should either enter the name of your group or specify the returns as separate series (transforming expressions like dlog() are also allowed). If you wish to use exogenous variable(s) in the mean equation, then specify the name(s) in the second box. As

for the variance regressors, use the fourth box. Autoregressive lags (*p*) are also allowed in the mean equation, whereas (*p,q*) are fixed at (1,1) for the variance and the correlation parts. First step of the estimation procedure begins with univariate GARCH models. You can choose between the three models provided in the add-in. Please note that all endogenous variables will have the same specifications in terms of mean and variance equations. Similarly, chosen error distribution will apply both to univariate (first stage) and multivariate (second stage) estimations. Theta vector corresponds to the parameters to be estimated for the dynamic correlation and default starting values will be used, unless they are initialized. Correlation targeting is analogous to variance targeting and is the default choice. You can also estimate an asymmetric version of the model by simply checking the related box.

Order of estimated parameters are such that, the two coefficients of the dynamic conditional correlations are always written first (i.e theta(1) and theta(2)). Unless you choose the correlation targeting, estimated constant coefficients comes right after. Degrees-of-freedom parameter is presented in a separate section, when Student's-t distribution is chosen. After a little bit of experimenting the layout of the output will become much clearer.

The add-in makes use of the Optimize feature of EViews and therefore requires version 8.0 or higher. In addition to the different optimization algorithms, parameters to be optimized can also be transformed in order to achieve better convergence-if needed.

One thing to mention is that the model allows up to 5 series at most. This is not a technical constraint, but rather mainly due to a practical issue. Since EViews currently cannot handle multidimensional arrays, operations on such variables have to be written explicitly. And as one might guess, it becomes an extremely tedious job for more than 5 variables. After all, it may not be that much restrictive from a theoretical perspective: DCC model assumes that all correlations are governed by the same dynamics (i.e. scalar coefficients), which may be an oversimplification of true behavior in higher order models.

Command Line:

Syntax-1: dccgarch11

Syntax-2: mygroup.dccgarch11(options)

Options:

Argument	Type	Explanation
xvar	*string*	Exogenous variable(s) for the mean equation
arlag	*numeric*	Autoregressive lag order for the mean equation
vxvar	*string*	Variance regressor(s)
unifit	*string*	Univariate GARCH model ("GARCH", "TGARCH" or "EGARCH")
backcast	*numeric*	Backcasting parameter (between 0 and 1 in increments of 0.1)
init	*string*	Initial coefficient vector for Theta (*optional*)
errors	*string*	Error distribution ("Normal" or "Student")
optim	*string*	Optimization algorithm ("BFGS", "OPG" or "Numeric")

iters	*numeric*	Number of iterations
tol	*numeric*	Tolerance level for convergence
smpl	*string*	Sample period
hetero		Heteroscedasticity consistent covariance for univariate fits
ctarget		Correlation targeting
asymm		Asymmetric DCC Model
coefsq		Use the squared coefficients in optimization
dccout		Save DCC output
unigarch		Save univariate GARCH output
correl		Save dynamic correlations as series
prompt		Open the GUI

Examples:

1) mygroup.dccgarch11(ctarget,correl)
2) mygroup.dccgarch11(unifit="TARCH",errors="Student",optim="OPG",asymm,coefsq,dccout,unigarch)

References:

Engle, R. (2002). "Dynamic Conditional Correlation: A Simple Class of Multivariate GARCH Models," Journal of Business and Economic Statistics, v. 20, pp. 339–350.

Cappiello, L., Engle R.F., and Sheppard, K. (2006). "Asymmetric Dynamics in the Correlations of Global Equity and Bond Returns", Journal of Financial Econometrics, v. 4, pp. 537-572.