NDK_EGARCH_FORE

Last Modified on 01/06/2017 4:12 pm CST

- C/C++
- .Net

```
int __stdcall NDK_EGARCH_FORE(double *        pData,
                              size_t          nSize,
                              double *        sigmas,
                              size_t          nSigmaSize,
                              double          mu,
                              const double *  Alphas,
                              size_t          p,
                              const double *  Gammas,
                              size_t          g,
                              const double *  Betas,
                              size_t          q,
                              WORD            nInnovationType,
                              double          nu,
                              size_t          nStep,
                              WORD            retType,
                              double          alpha,
                              double *        retVal
                              )
```

Calculates the out-of-sample forecast statistics.

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful
NDK_FAILED   Operation unsuccessful. See **Macros** for full list.

Parameters

[in]	**pData**	is the univariate time series data (a one dimensional array).
[in]	**nSize**	is the number of observations in pData.
[in]	**sigmas**	is the univariate time series data (a one dimensional array of cells (e.g. rows or columns)) of the last q realized volatilities.
[in]	**nSigmaSize**	is the number of elements in sigmas. Only the latest q observations are used.
[in]	**mu**	is the GARCH model conditional mean (i.e. mu).
[in]	**Alphas**	are the parameters of the ARCH(p) component model (starting with the lowest lag).
[in]	**p**	is the number of elements in Alphas array

[in,out]	Gammas	are the leverage parameters (starting with the lowest lag).
[in]	g	is the number of elements in Gammas. Must be equal to (p-1).
[in]	Betas	are the parameters of the GARCH(q) component model (starting with the lowest lag).
[in]	q	is the number of elements in Betas array
[in]	nInnovationType	is the probability distribution function of the innovations/residuals (see **INNOVATION_TYPE**) • INNOVATION_GAUSSIAN Gaussian Distribution (default) • INNOVATION_TDIST Student's T-Distribution, • INNOVATION_GED Generalized Error Distribution (GED)
[in]	nu	is the shape factor (or degrees of freedom) of the innovations/residuals probability distribution function.
[in]	nStep	is the forecast time/horizon (expressed in terms of steps beyond end of the time series).
[in]	retType	is a switch to select the type of value returned 1. Mean forecast 2. Forecast Error 3. Volatility term structure 4. Confidence interval lower limit 5. Confidence interval upper limit (see **FORECAST_RETVAL_FUNC**)
[in]	alpha	is the statistical significance level. If missing, a default of 5% is assumed.
[out]	retVal	is the simulated value for the GARCH process.

Remarks

1. The underlying model is described **here**.
2. By definition, the EGARCH_FORE function returns a constant value equal to the model mean (i.e. \mu) for all horizons.
3. The time series is homogeneous or equally spaced.
4. The time series may include missing values (e.g. #N/A) at either end.
5. The number of gamma-coefficients must match the number of alpha-coefficients.
6. The number of parameters in the input argument - alpha - determines the order of the ARCH component model.
7. The number of parameters in the input argument - beta - determines the order of the GARCH component model.

Requirements

Header	SFSDK.H
Library	SFSDK.LIB
DLL	SFSDK.DLL

int NDK_EGARCH_FORE(double[] **pData,**	**Namespace:** NumXLAPI
UIntPtr **nSize,**	**Class:** SFSDK
double **mu,**	**Scope:** Public
double[] **Alphas,**	**Lifetime:** Static
UIntPtr **p,**	
double[] **Gammas,**	
double[] **Betas,**	
UIntPtr **q,**	
short **nInnovationType,**	
double **nu,**	
UIntPtr **nStep,**	
short **retType,**	
ref double retVal	
)	

Calculates the out-of-sample forecast statistics.

Return Value

a value from **NDK_RETCODE** enumeration for the status of the call.

NDK_SUCCESS operation successful
Error   Error Code

Parameters

[in]	**pData**	is the univariate time series data (a one dimensional array).
[in]	**nSize**	is the number of observations in pData.
[in]	**mu**	is the GARCH model conditional mean (i.e. mu).
[in]	**Alphas**	are the parameters of the ARCH(p) component model (starting with the lowest lag).
[in]	**p**	is the number of elements in Alphas array
[in,out]	**Gammas**	are the leverage parameters (starting with the lowest lag).
[in]	**g**	is the number of elements in Gammas. Must be equal to (p-1).
[in]	**Betas**	are the parameters of the GARCH(q) component model (starting with the lowest lag).
[in]	**q**	is the number of elements in Betas array
[in]	**nInnovationType**	is the probability distribution function of the innovations/residuals (see **INNOVATION_TYPE**)

- INNOVATION_GAUSSIAN Gaussian Distribution (default)
- INNOVATION_TDIST Student's T-Distribution,
- INNOVATION_GED Generalized Error Distribution (GED)

[in]	**nu**	is the shape factor (or degrees of freedom) of the

		innovations/residuals probability distribution function.
[in]	**nStep**	is the forecast time/horizon (expressed in terms of steps beyond end of the time series).
[in]	**retType**	is a switch to select the type of value returned

1. Mean forecast
2. Forecast Error
3. Volatility term structure
4. Confidence interval lower limit
5. Confidence interval upper limit (see **FORECAST_RETVAL_FUNC**)

[in]	**alpha**	is the statistical significance level. If missing, a default of 5% is assumed.
[out]	**retVal**	is the simulated value for the GARCH process.

Remarks

1. The underlying model is described **here**.
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7. The number of parameters in the input argument - beta - determines the order of the GARCH component model.

Exceptions

Exception Type	Condition
None	N/A

Requirements

Namespace	NumXLAPI
Class	SFSDK
Scope	Public
Lifetime	Static
Package	NumXLAPI.DLL

Examples

References

Hamilton, J .D.; Time Series Analysis , Princeton University Press (1994), ISBN 0-691-04289-6

Tsay, Ruey S.; Analysis of Financial Time Series John Wiley & SONS. (2005), ISBN 0-471-690740

See Also

[template("related")]