NDK_EGARCH_SIM

Last Modified on 05/02/2016 1:22 pm CDT

- C/C++
- .Net

```
int __stdcall NDK_EGARCH_SIM(double          mu,
                             const double *  Alphas,
                             size_t          p,
                             const double *  Gammas,
                             size_t          g,
                             const double *  Betas,
                             size_t          q,
                             WORD            nInnovationType,
                             double          nu,
                             double *        pData,
                             size_t          nSize,
                             double *        sigmas,
                             size_t          nSigmaSize,
                             UINT            nSeed,
                             double *        retArray,
                             size_t          nSteps
                            )
```

Returns a simulated data series the underlying EGARCH process.

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful

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

Parameters

[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]	**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**)

[in]	**nu**	is the shape factor (or degrees of freedom) of the innovations/residuals probability distribution function.
[in]	**pData**	is the univariate time series data (a one dimensional array).
[in]	**nSize**	is the number of observations in X.
[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]	**nSeed**	is an unsigned integer for setting up the random number generators
[out]	**retArray**	is the calculated simulation value
[in]	**nSteps**	is the number of future steps to simulate for.

Remarks

1. The underlying model is described **here**.
2. The time series is homogeneous or equally spaced.
3. The time series may include missing values (e.g. #N/A) at either end.
4. The number of gamma-coefficients must match the number of alpha-coefficients.
5. The number of parameters in the input argument - alpha - determines the order of the ARCH component model.
6. The number of parameters in the input argument - beta - determines the order of the GARCH component model.
7. By definition, the EGARCH_FORE function returns a constant value equal to the model mean (i.e. \(\mu\)) for all horizons.
8. The function EGARCH_SIM was added in version 1.63 SHAMROCK.

Requirements

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

```
int NDK_EGARCH_SIM(double    mu,
                   double[]  Alphas,
                   UIntPtr   p,
                   double[]  Gammas,
                   double[]  Betas,
                   UIntPtr   q,
                   short     nInnovationType,
                   double    nu,
                   double[]  pData,
```

Namespace: NumXLAPI
Class: SFSDK
Scope: Public
Lifetime: Static

```
                    UIntPtr     nSize,
                    UIntPtr     nSeed,
                    ref double retVal,
                    UIntPtr     nSteps
                   )
```

Returns a simulated data series the underlying EGARCH process.

Return Value

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

NDK_SUCCESS operation successful
Error Error Code

Parameters

[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]	**Gammas**	are the leverage parameters (starting with the lowest lag).
[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**)
[in]	**nu**	is the shape factor (or degrees of freedom) of the innovations/residuals probability distribution function.
[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]	**nSeed**	is an unsigned integer for setting up the random number generators
[out]	**retArray**	is the calculated simulation value
[in]	**nSteps**	is the number of future steps to simulate for.

Remarks

1. The underlying model is described **here**.
2. The time series is homogeneous or equally spaced.
3. The time series may include missing values (e.g. #N/A) at either end.
4. The number of gamma-coefficients must match the number of alpha-coefficients.
5. The number of parameters in the input argument - alpha - determines the order of the ARCH component model.
6. The number of parameters in the input argument - beta - determines the order of the GARCH

component model.

7. By definition, the EGARCH_FORE function returns a constant value equal to the model mean (i.e. \(\mu\)) for all horizons.
8. The function EGARCH_SIM was added in version 1.63 SHAMROCK.

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")]