

NDK_GARCH_FORE

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- C/C++
- .Net

```
int __stdcall NDK_GARCH_FORE(double *      pData,
                             size_t       nSize,
                             double *     sigmas,
                             size_t       nSigmaSize,
                             double        mu,
                             const double * Alphas,
                             size_t        p,
                             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] 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 or Normal Distribution
 - 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 calculated forecast value

Remarks

1. The underlying model is described [here](#).
2. By definition, the GARCH_FORE function return a constant value equal to the model mean (i.e. μ) 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 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.

Requirements

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

int __stdcall NDK_GARCH_FORE(double *
size_t

pData,
nSize,

Namespace: NumXLAPI
Class: SFSDK

```

double *    sigmas,
size_t     nSigmaSize,
double     mu,
const double * Alphas,
size_t     p,
const double * Betas,
size_t     q,
WORD       nInnovationType,
double     nu,
size_t     nStep,
WORD       retType,
double     alpha,
double *    retVal
)

```

Scope: Public
Lifetime: Static

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] **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 or Normal Distribution
 - [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 calculated forecast value

Remarks

1. The underlying model is described [here](#).
2. By definition, the GARCH_FORE function return a constant value equal to the model mean (i.e. μ) for all horizons.
3. The time series is homogeneous or equally spaced.
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6. 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
 - * T say, Ruey S.; [Analysis of Financial Time Series](#) John Wiley & SONS. (2005), ISBN 0-471-690740
 - * D. S.G. Pollock; [Handbook of Time Series Analysis, Signal Processing, and Dynamics](#); Academic Press; Har/Cdr edition(Nov 17, 1999), ISBN: 125609906
 - * Box, Jenkins and Reisel; [Time Series Analysis: Forecasting and Control](#); John Wiley & SONS.; 4th edition(Jun 30, 2008), ISBN: 470272848
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See Also

[template("related")]
