NDK_GARCHM_GOF

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- C/C++
- .Net

```
int __stdcall NDK_GARCHM_GOF(double *       pData,
                             size_t         nSize,
                             double         mu,
                             double         flambda,
                             const double * Alphas,
                             size_t         p,
                             const double * Betas,
                             size_t         q,
                             WORD           nInnovationType,
                             double         nu,
                             WORD           retType,
                             double *       retVal
                            )
```

Computes the log-likelihood ((LLF), Akaike Information Criterion (AIC) or other goodness of fit function of the GARCH model.

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful

NDK_FAILED Operation unsuccessful. See Macros< /u> 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]	**mu**	is the GARCH model conditional mean (i.e. mu).
[in]	**flambda**	is the volatility coefficient for the mean. In finance, lambda is referenced as the risk premium.
[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 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]	**retType**	is a switch to select a fitness measure (see **GOODNESS_OF_FIT_FUNC**)
[out]	**retVal**	is the calculated goodness of fit value.

Remarks

1. The underlying model is described **here**.
2. The Log-Likelihood Function (LLF) is described **here**.
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 maximum likelihood estimation (MLE) is a statistical method for fitting a model to the data and provides estimates for the model's parameters.
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_GARCHM_GOF(double[] pData,
                   size_t   nSize,
                   double   mu,
                   double   flambda,
                   double[] Alphas,
                   UIntPtr  p,
                   double[] Betas,
                   UIntPtr  q,
                   short    nInnovationType,
                   double   nu,
                   short    retType,
```

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

```
                    double[] retVal
                )
```

Computes the log-likelihood ((LLF), Akaike Information Criterion (AIC) or other goodness of fit function of the GARCH model.

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]	**flambda**	is the volatility coefficient for the mean. In finance, lambda is referenced as the risk premium.
[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 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]	**retType**	is a switch to select a fitness measure (see **GOODNESS_OF_FIT_FUNC**)
[out]	**retVal**	is the calculated goodness of fit value.

Remarks

1. The underlying model is described **here**.
2. The Log-Likelihood Function (LLF) is described **here**.
3. The time series is homogeneous or equally spaced.
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5. The maximum likelihood estimation (MLE) is a statistical method for fitting a model to the data and provides estimates for the model's parameters.
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.

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

* 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

See Also