NDK_EGARCH_RESID

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- C/C++
- .Net

```
int __stdcall NDK_EGARCH_RESID(double *        pData,
                               size_t          nSize,
                               double          mu,
                               const double *  Alphas,
                               size_t          p,
                               const double *  Gammas,
                               size_t          g,
                               const double *  Betas,
                               size_t          q,
                               WORD            nInnovationType,
                               double          nu,
                               WORD            retType
                               )
```

Returns an array of cells for the standardized residuals of a given GARCH model.

Returns

status code of the operation

Return values

NDK_SUCCESS Operation successful

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

Deprecated:

this function is being replaced by **NDK_EGARCH_FITTED()**

See Also

NDK_GARCH_VALIDATE()

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 EGARCH 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**)

- 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 residuals-type:raw or standardized. see **RESID_RETVAL_FUNC** |

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. The standardized residuals have a mean of zero and a variance of one (1).
8. The E-GARCH model's standardized residuals is defined as: $$\epsilon_t = \frac{a_t}{\sigma_t}$$ $$a_t = x_t - \mu$$ Where:
   - ϵ is the E-GARCH model's standardized residual at time t.
   - a_t is the E-GARCH model's residual at time t.
   - x_t is the value of the time series at time t.
   - μ is the E-GARCH mean.
   - σ_t is E-GARCH conditional volatility at time t.

Requirements

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

int NDK_EGARCH_RESID(double[] pData, UIntPtr nSize,	**Namespace:** NumXLAPI **Class:** SFSDK

double	**mu,**	
double[]	**Alphas,**	
UIntPtr	**p,**	
double[]	**Gammas,**	
double[]	**Betas,**	
UIntPtr	**q,**	
short	**nInnovationType,**	
double	**nu,**	
short	**retType**	
)		

Scope: Public
Lifetime: Static

Returns an array of cells for the standardized residuals of a given GARCH model.

Return Value

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

NDK_SUCCESS operation successful
Error   Error Code

Deprecated:

this function is being replaced by **NDK_EGARCH_FITTED()**

See Also

NDK_GARCH_VALIDATE()

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 EGARCH 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**)

- 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 residuals-type:raw or standardized. see **RESID_RETVAL_FUNC**

Remarks

1. The underlying model is described **here**.
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   - a_t is the E-GARCH model's residual at time t.
   - x_t is the value of the time series at time t.
   - μ is the E-GARCH mean.
   - σ_t is E-GARCH conditional volatility at time t.

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")]