NDK_EGARCH_LRVAR

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- C/C++
- .Net

```
int __stdcall NDK_EGARCH_LRVAR(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 *        retVal
                              )
```

Calculates the long-run average volatility for a given E-GARCH model.

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,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.

[out] **retVal** is the calculated Long run volatility.

Remarks

1. The underlying model is described **here**.
2. The EGARCH long-run average log variance is defined as: $\ln V_L=\frac{\alpha_o+\eta \times \sum_{i=1}^p\alpha_i}{1-\sum_{j=1}^q\beta_j}$ Where:
   - Gaussian distributed innovations/shocks: $\eta=\sqrt{\frac{\pi}{2}}$
   - GED distributed innovations/shocks. $\eta=\frac{\Gamma(2/\nu)}{\sqrt{\Gamma(1/\nu)\times\Gamma(3/\nu)}}$
   - Student's t-Distributed innovations/shocks. $\eta=\frac{\sqrt{\nu-2}\times\Gamma(\frac{\nu-1}{2})}{\sqrt{\pi}\times\Gamma(\frac{\nu}{2})}$
3. The time series is homogeneous or equally spaced.
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. EGARCH_CHECK examines the model's coefficients for:
   - Coefficients are all positive

Requirements

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

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

```
int NDK_EGARCH_LRVAR(double     mu,
                     double[]   Alphas,
                     UIntPtr    p,
                     double[]   Gammas,
                     double[]   Betas,
                     UIntPtr    q,
                     short      nInnovationType,
                     double     nu,
                     ref double retVal
                    )
```

Calculates the long-run average volatility for a given E-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]	**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]	**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.
[out]	**retVal**	is the calculated Long run volatility.

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1. The underlying model is described **here**.
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3. The time series is homogeneous or equally spaced.
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. EGARCH_CHECK examines the model's coefficients for:
   - Coefficients are all positive

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")]