NDK_GARCHM_LRVAR

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- C/C++
- .Net

```
int NDK_GARCHM_LRVAR(double          mu,
                     double          flambda,
                     const double *  Alphas,
                     size_t          p,
                     const double *  Betas,
                     size_t          q,
                     WORD            nInnovationType,
                     double          nu,
                     double *        retVal
                     )
```

Calculates the long-run average volatility for the given GARCH-M 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] **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.

[out] **retVal**   is the calculated long run value

Remarks

1. The underlying model is described **here**.
2. The GARCH-M long-run average variance is defined as: $V_L=\frac{\alpha_o}{1-\sum_{i=1}^p\alpha_i-\sum_{j=1}^q\beta_j}$
3. The time series is homogeneous or equally spaced.
4. GARCHM_CHECK examines the model's coefficients for:
   - Coefficients are all positive
   - $\lambda > 0$
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

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int NDK_GARCHM_LRVAR(double   mu,
        double   lambda,
        double[] Alphas,
        UIntPtr   p,
        double[] Betas,
        UIntPtr   q,
        short   nInnovationType,
        double   nu,
        ref double retVal
)

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

Calculates the long-run average volatility for the given GARCH-M 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]	**lambda**	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.
[out]	**retVal**	is the calculated long run value

Remarks

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3. The time series is homogeneous or equally spaced.
4. GARCHM_CHECK examines the model's coefficients for:
   - Coefficients are all positive
   - $\lambda > 0$
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.

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

[template("related")]