NDK_EWXCF

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- C/C++
- .Net

```
int __stdcall NDK_EWXCF(double * X,
                        double * Y,
                        size_t   N,
                        double   lambda,
                        size_t   step,
                        double * retVal
                       )
```

Computes the correlation factor using the exponential-weighted correlation function.

NDK_EWXCF computes the correlation estimate using the exponential-weighted covariance (EWCOV) and volatility (EWMA/EWV) method for each time series.

Returns

status code of the operation

Return values

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

Parameters

[in] **X** is the first univariate time series data (a one dimensional array).
[in] **Y** is the second univariate time series data (a one dimensional array).
[in] **N** is the number of observations in X (or Y).
[in] **lambda** is the smoothing parameter used for the exponential-weighting scheme. If missing, a default value of 0.94 is assumed.
[in] **step** is the forecast time/horizon (expressed in terms of steps beyond the end of the time series X). If missing, a default value of 0 is assumed.
[out] **retVal** is the estimated value of the correlation factor.

Remarks

1. The time series are homogeneous or equally spaced.
2. The two time series must have identical size and time order.
3. The cross correlation function is defined as:

- $\rho^{(xy)}_t=\frac{\sigma_t^{(xy)}}{_x\sigma_t}\times{_y\sigma_t}}$
- $\sigma_t^{(xy)} = \lambda\sigma_{t-1}^{(xy)}+(1-\lambda)x_{t-1}y_{t-1}$
- $_x\sigma_t^2=\lambda\times{_x\sigma_{t-1}^2}+(1-\lambda)x_{t-1}^2$
- $_y\sigma_t^2=\lambda\times{_y\sigma_{t-1}^2}+(1-\lambda)y_{t-1}^2$,

where:

- \(\rho^{(xy)}_t\) is the sample correlation between X and Y at time t.
- \(\sigma_t^{(xy)}\) is the sample exponential-weighted covariance between X and Y at time t.
- \(_x\sigma_t\) is the sample exponential-weighted volatility for the time series X at time t.
- \(_y\sigma_t\) is the sample exponential-weighted volatility for the time series Y at time t.
- \(\lambda\) is the smoothing factor used in the exponential-weighted volatility and covariance calculations.

Requirements

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

Examples

```
int NDK_EWXCF(double[]    pData1,
              double[]    pData2,
              UIntPtr     nSize,
              double      lambda,
              UIntPtr     nStep,
              out double  retVal
             )
```

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

NDK_EWXCF computes the correlation estimate using the exponential-weighted covariance (EWCOV) and volatility (EWMA/EWV) method for each time series.

Return Value

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

NDK_SUCCESS operation successful
Error Error Code

Parameters

[in] **pData1** is the first univariate time series data (a one dimensional array).

[in] **pData2** is the second univariate time series data (a one dimensional array).

[in] **nSize** is the number of observations in pData1 (or pData2).

[in] **lambda** is the smoothing parameter used for the exponential-weighting scheme. If missing, a default value of 0.94 is assumed.

[in] **nStep** is the forecast time/horizon (expressed in terms of steps beyond the end of the time series X). If missing, a default value of 0 is assumed.

[out] **retVal** is the estimated value of the correlation factor.

Remarks

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")]