NDK_XCF

Last Modified on 04/15/2016 11:08 am CDT

- C/C++
- .Net

```
int __stdcall NDK_XCF(double * X,
                      double * Y,
                      size_t   N,
                      size_t   K,
                      WORD     method,
                      WORD     retType,
                      double * retVal
                     )
```

Calculates the cross-correlation function between two 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.

[in] **K** is the lag order (e.g. 0=no lag, 1=1st lag, etc.) to use with the second time series input (X). If missing, a default lag order of zero (i.e. no-lag) is assumed.

[in] **method** is the algorithm/method to use for calculating the correlation (see notes below)

[in] **retType** is a switch to select the return output (1 = correlation value(default), 2 = std error).

[out] **retVal** is the calculated value of this function.

Remarks

1. The time series is homogeneous or equally spaced.
2. The two time series must be identical in size.
3. The NDK_XCF functions supports the following methods:

Method	Value	Description
XCF_PEARSON	1	Pearson
XCF_SPEARMAN	2	Spearman
XCF_KENDALL	3	Kendall

3. The Pearson correlation, r_{xy}, is defined as follows:

\[r_{xy}= \frac{\sum_{i=1}^N(x_i-\bar{x})(y_i-\bar{y})}{\sqrt{\sum_{i=1}^N(x_i-\bar{x})^2\times\sum_{i=1}^N(y_i-\bar{y})^2}}\],

where:

- \(\bar{x}\) is the sample average of time series X.
- \(\bar{y}\) is the sample average of time series Y.
- \(x_i \in X\) is a value from the first input time series data.
- \(y_i \in Y\) is a value from the second input time series data.
- \(N\) is the number of pairs \(\left (x_i,y_i \right)\) that do not contain a missing observation.

Requirements

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

Examples

```
int NDK_XCF(double[]   pData1,
            double[]   pData2,
            UIntPtr    nSize,
            UIntPtr    nLag,
            short      nMethod,
            short      retType,
            ref double retVal
           )
```

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

Calculates the cross-correlation function between two 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.

[in] **nLag** is the lag order (e.g. 0=no lag, 1=1st lag, etc.) to use with the second time series input (X). If missing, a default lag order of zero (i.e. no-lag) is assumed.

[in] **nMethod** is the algorithm/method to use for calculating the correlation (see notes below)

[in] **retType** is a switch to select the return output (1 = correlation value(default), 2 = std error).

[out] **retVal** is the calculated value of this function.

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where:

- $\bar{x}$ is the sample average of time series X.
- $\bar{y}$ is the sample average of time series Y.
- $x_i \in X$ is a value from the first input time series data.
- $y_i \in Y$ is a value from the second input time series data.
- N is the number of pairs $\left (x_i,y_i \right)$ that do not contain a missing observation.

Examples

References

Hull, John C.; Options, Futures and Other DerivativesFinancial Times/ Prentice Hall (2011), ISBN 978-0132777421

See Also

[template("related")]